KEYSTONE

THE MINING CATALOG

COMBINED WITH

COAL FIELD DIRECTORY

CONSOLIDATED PUBLISHING

COMPANY INC.

LIBRARY OF THE
UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

q622.33
K524
1916

[redacted]

[redacted]

LIBRARY
UNIVERSITY OF ILLINOIS,
URBANA.

THE
MINING CATALOG

COMBINED WITH

COAL FIELD DIRECTORY

FOR THE YEAR

1916

UNIVERSITY OF ILLINOIS LIBRARY
FEB 5 - 1921

Indexed by Firms Represented, Their Branch Offices and
Agencies, and by Products

TOGETHER WITH A

DIRECTORY OF MINES BY STATES

DEVISED, COMPILED, EDITED AND PUBLISHED
ANNUALLY BY

KEYSTONE CONSOLIDATED PUBLISHING CO., INC.

302 PENN AVENUE
PITTSBURGH, PA

Copyrighted 1916 by
Keystone Consolidated Publishing Co., Inc.
All rights reserved.

q622.33
K524
1916.

INTRODUCTION

TO THE MINING MAN:—

"Next to knowing a thing is to know where to get information about it."

This volume is dedicated to you.

It is given to you to USE.

The object of the MINING CATALOGS is to give you a comprehensive digest on all classes of mining machinery and equipment. It is conveniently arranged in Sections or Subjects, so that the investigation of any subject may be pursued without coming in contact with something entirely irrelevant.

The subject of "Preparation and Loading of Coal," for instance, is covered in the Tipple Section. In addition to the condensed catalogues of the manufacturers of this class of equipment will be found engineering data, specification data, tables, formulae, charts, etc., bearing upon this particular subject.

Likewise the subjects of Development and Engineering, Mine Timbering and Building Materials, Coke Ovens, Power Plant, Lubrication, Ventilation, Hoisting and Haulage, Mine Cars, Track, Hydraulics, Mine Locomotives, Mining Machines, Electrical Supplies, Explosives, Mine Lighting, First Aid, and General Mine Supplies, are each covered in a thorough and efficient manner.

Fully ninety per cent of the manufacturers of mining machinery and equipment who are really factors in the mining industry are represented in the MINING CATALOGS.

This year's book carries an increase of 40% over last year.

Every additional page of catalogue description means that you are getting a more valuable reference book. This point you should always keep in mind, and if you are looking for the catalogue of some firm that you cannot find in this book we want you to write to us, and to the firm who has missed the opportunity of subscribing to this catalog service.

The firms who have subscribed to this book want to know that you are using it. It is no more than right that you should let them know that it is valuable to you as a reference work. They want to know that their confidence has not been misplaced.

TO THE MANUFACTURER AND DEALER:—

In publishing the MINING CATALOGS we have an IDEAL constantly before us. This ideal is nearer accomplishment with this issue than ever before.

On the opposite side of this page, in our presentation to the mining man, you can see what the object of this volume is, and the mission we have to perform.

Since issuing both our 1914 and 1915 Editions we have received over five thousand letters from mining men all over the country, telling us how valuable this book is to them in looking up different types and classes of machinery and equipment, in addition to the Engineering Data.

This leaves no doubt in our minds that we have struck the right idea.

All the operating officials of coal mines receive a vast amount of literature during the year from manufacturers. This literature comes in the shape of catalogues, bulletins, pamphlets, circulars, house-organs, etc., of all sizes, shapes and forms. A very large proportion of this literature is wasted, because it is either thrown away or filed away so carefully it cannot be located when it is needed.

Is it not much more convenient to have all the essential points of your products shown in one volume containing similar information shown by other manufacturers? Will it not save the mining man time in his office routine?

You, who have helped make this book possible, should further extend your cooperation in making the Mining Catalogs more useful to the mining man, by describing your products in such a way that it will leave no doubt in the minds of the mining fraternity as to just what their advantages are.

This will reflect favorably upon you in various ways, and at the same time will help to reduce the wanton waste in advertising.

When followed up with the information which our Directory of Mines gives you, your space in this book is bound to be productive of results. We thank you for your cooperation and patronage.

Respectfully submitted,
KEYSTONE CONSOLIDATED PUBLISHING COMPANY.
Joseph J. Vigneau, President.
E. B. Day, Vice President and General Manager.
Ralph C. Becker, Secretary.

456142

KEYSTONE
CONSOLIDATED
PUBLISHING
COMPANY Inc.

THE.
MINING
CATALOG
COMBINED WITH
COAL FIELD
DIRECTORY

GENERAL INDEX

Abbreviations 622

Alphabetical List of Firms Catalogued 6 to 8

Alphabetical List of Firms Catalogued, Giving List of Branch Offices, Representatives and Agencies....... 9 to 24

Building Materials and Mine Timbering Section, Engineering Data and Catalog Descriptions ....144 to 169

By-Product Coke Ovens in United States 62

Coke Oven Section Engineering Data..170 to 174

Development and Engineering Section Catalog Descriptions .... 64 to 82

Directory of Mines ....621 to 786
  - Alabama ....623 to 628
  - Arkansas ....628 to 629
  - Canada ....630 to 633
  - Colorado ....634 to 639
  - Illinois ....640 to 650
  - Indiana ....650 to 655
  - Iowa ....655 to 659
  - Kansas ....659 to 661
  - Kentucky ....661 to 672
  - Maryland ....673 to 674
  - Michigan 674
  - Missouri ....675 to 678
  - Montana ....678 to 679
  - New Mexico ....679 to 680
  - North Dakota ....680 to 681
  - Ohio ....681 to 694
  - Oklahoma ....694 to 697
  - Pennsylvania Anthracite ....697 to 705
  - Pennsylvania Bituminous ....706 to 744
  - Tennessee ....744 to 748
  - Texas ....748 to 749
  - Utah ....750 to 751
  - Virginia ....751 to 753
  - Washigton ....754 to 755
  - West Virginia ....756 to 784
  - Wyoming ....785 to 786

Electrical Section Engineering Data and Catalog Description ....509 to 551

Explosive Section, Engineering Data and Catalog Descriptions ....552 to 573

Hoisting and Haulage Section, Engineering Data and Catalog Descriptions ....287 to 332

Hydraulic Section, Engineering Data, and Catalog Descriptions ....401 to 456

Index of Products .... 41 to 60

Introduction 3

Locomotive Section, Engineering Data and Catalog Descriptions ....457 to 486

Lubrication Section, Catalog Descriptions ....249 to 256

Mine Car Section, Engineering Data and Catalog Descriptions.........333 to 364

Mine Inspectors (Coal) of United States 63

Mine Lighting Section, Catalog Descriptions ....574 to 586

Mine Supplies Section, Engineering Data and Catalog Descriptions....597 to 610

Miners' Tools and Supplies Section, Catalog Descriptions ....611 to 620

Mining Machine Section, Engineering Data and Catalog Descriptions....487 to 508

Power Plant Section, Engineering Data and Catalog Descriptions ....175 to 248

Safety First and First Aid Section, Catalog Descriptions ....587 to 596

Repairs—New and Used Machinery Section, Catalog Descriptions ....371 to 376

Shop Section, Catalog Descriptions....365 to 370

Tipple Section, Engineering Data and Catalog Descriptions .... 83 to 143

Track Section, Engineering Data and Catalog Descriptions ....377 to 400

Ventilation Section, Engineering Data and Catalog Descriptions ....257 to 286

Alphabetical List of Firms Catalogued

A

Aetna Explosive Co.........558, 559
Aldrich Pump Co., The......412, 413
Alexander Car Replacer Mfg. Co.485
Allen & Garcia Co................93
Allison Coupon Co..............618
Allis-Chalmers Mfg. Co...........
................204, 205, 299, 411
American Blower Co....267, 268, 269
American Car & Foundry Co.....
.... 336, 337
American Steam Gauge & Valve Mfg. Co. 226
American Steam Pump Co.......414
American Steel & Wire Co...321, 516
Anthracite Separator Co........113
Armstrong Cork & Insulation Co.216
Armstrong Mfg. Co.............197
Asbestos Protected Metal Co.....164
Ashton Valve Co., The..........227
Atlantic Refining Co., The.......250
Atlas Powder Co...........560, 561
Austin Powder Co..............557
Automatic Reclosing Circuit Breaker Co. 539

B

Ball Engine Co.................210
Barrett Co., The................156
Beck & Corbitt Iron Co..........598
Boylston Steam Specialty Co.....228
Boyts, Porter & Co.....415, 416, 417
Broderick & Bascom Rope Co....322
Brownell Co., The...............188
Buckeye Rolling Mill Co.........381
Buettner & Shelburne Machine Co. 504, 505
Buff & Buff Mfg. Co.............76
Buffalo Foundry & Mach. Co.....367
Burnet Company, The 332
Burton Powder Co., The.........566
Byers, A. M., Co................441

C

C-A-Wood-Preserver Co. 158
Cabot, Samuel, Inc. 157
Calebaugh Self-Lubricating Carbon Co. 540
Cambria Steel Co. 400
Cameron, A. S., Steam Pump Works 418, 419
Cancos Manufacturing Co.......236
Cast Iron Pipe Makers......442, 443
Cataract Refining & Mfg. Co.....251
Cement-Gun Co., Inc.............75
Chandler & Taylor Co...........189
Cheesman & Elliot 160
Cherry Tree Machine Co.........302
Cincinnati Frog & Switch Co., The 390
Cleveland Armature Works......549
Cling Surface Co................246
Clinton Switch Co...............391
Colonial Supply Co.....599, 600, 601
Combustion Engineering Corporation 200, 201
Concordia Safety Lamp Co., Inc..575
Connellsville Mfg. & Mine Supply Co. 275, 300, 301, 420
Coppus Engineering & Equipment Co. 202
Cordley & Hayes................573
Crawford & McCrimmon Co.....303
Cross Engineering Co...........123
Crouse-Hinds Co. 478
Cutler-Hammer Mfg. Co., The.....
..........................280, 281

D

D. & W. Fuse Co................517
Daum, A. F.....................543
Davis Instrument Mfg. Co., Inc...77
Dayton Turbine Pump Co., The..421
De Laval Steam Turbine Co.....428
Dempcy-Degener Co. 129
Deming Co., The ....
........422, 423, 424, 425, 426, 427
Detroit Graphite Co. 161
Diamond Machine Co. 308
Dixon, Joseph, Crucible Co......252
Dodge Sales & Engineering Co....
............114, 115, 245, 270, 271
Draeger Oxygen Apparatus Co...588
Drake, A. W., Drilling Co........65
Dravo Contracting Co............71
Dudley Electric & Machine Co....550
Duff Manufacturing Co., The.....606
Duncan Foundry & Machine Works.335
Du Pont, E. I. de Nemours & Co...
................562, 563, 564, 565
Durabla Mfg. Co................237

E

Economy Fuse & Mfg. Co.......544
Edison Storage Battery Co..469, 576
Electric Carrier Co. 465
Electric Railway Equipment Co..520
Electric Service Co., Inc., The.....551
Electric Service Supplies Co.528, 529
Electric Storage Battery Co......470
Elliott, B. K., Co.................78
Elliot Frog & Switch Co.........392
Elmore, Guy H.........116, 117, 429
Empire Chemical Co.............503
Enterprise Foundry & Machine Works 339
Epping-Carpenter Pump Co......430
Everhart Brass Co. 315

F

Fairbanks Co., The.........130, 229
Fairmont Mining Machinery Co...
....94, 95, 96, 97, 98, 99, 398, 399, 431, 498
Falk Co., The 314
Ferranti Contracting Co., The....72
Flood City Mfg. Co.........522, 523
Flory, S., Mfg. Co..........304, 305
Foster, L. B., Co................385
Foster Engineering Co..........230
Frank, M. K....................386
Freeman, S., & Sons Mfg. Co., The 190
Frick & Lindsay Co.........602, 603
Fulton Bag & Cotton Mills.......285
Fulton Pit Car & Mfg. Co....340, 341
Fulton Tool Co., The............614

G

Garton, W. R., Co., The..........530
Gem Mfg. Co...................247

Alphabetical List of Firms Catalogued---Continued

General Electric Co.........134, 206 207, 282, 316, 438, 459, 479, 499, 521

General Roofing Mfg. Co........165

Glow Electric Co., The..........372

Golden-Anderson Valve Specialty Co. 231

Goodin-Reid & Co...............283

Goodman Mfg. Co.......... 460, 491

Goodrich, B. F., Co., The....120, 238

Gould Storage Battery Co.......471

Goulds Mfg. Co. 432

Graham Nut Co. 360

Green, L. A. 387

Grier Bros. Co. 583

Gustafson Mfg. Co..............338

H

Hardsocg, Martin, Co., The...612, 613

Hardsocg Mfg. Co..........612, 613

Harrison Safety Boiler Works....222

Hazard Mfg. Co. 323, 518

Heller & Brightly 79

Hendrick Mfg. Co. 124

Hercules Powder Co....567, 568, 569

Hess-Bright Mfg. Co............480

Highland Chemical Products Co..440

Hoch Hame Co., Inc.............608

Hockensmith Wheel & Mine Car Co. 342, 343

Hoffman Brothers 66

Holmes, Robert, & Bros., Inc.306, 307

Homestead Valve Mfg. Co.......232

Houston, Stanwood & Gamble Co.191

Howe Scale Co., The............131

Howells Mining Drill Co.........500

Humphrys', R. A., Sons..........610

Hyatt Roller Bearing Co........359

Hyde, W. H......................73

I

Imperial Brass Mfg. Co.........368

Indestructo Electric Mine Lamp Co., Inc. 577

Indiana Foundry Co.............486

Indianapolis Switch & Frog Co., The 393

Ingersoll-Rand Co. 221, 224, 496

Iron City Electric Co.......531, 546

Ironton Engine Co..............466

Irwin Foundry & Mine Car Co...348

J

Jamison Rail Bond & Electrical Supply Co. 527

Jeffrey Mfg. Co........100, 101, 102 138, 272, 273, 274, 462, 463, 492, 493

Jenkins Bros. 233

Johannessen, J., & Son 67

Johns, H. W.,-Manville Co......166

Johns-Pratt Co. 239

Johnston-Morehouse-Dickey Co..286

Justrite Mfg. Co................584

K

Kanawha Mfg. Co..........104, 349

Keasbey & Mattison Co.........167

Keeler, E., Co..................192

Kenova Mine Car Co.......344, 345

Kerr Turbine Co................211

Kester Electric Co.............547

Keystone Lubricating Co........253

Kilby Frog & Switch Co.........394

King Powder Co., The..........570

Kingsford Foundry & Machine Works 433

Koehler Mfg. Co. 580

L

Lawrenceville Bronze Co........605

Lazarus, M. E., Co., The.........388

Leetonia Tool Co., The...........615

Lehigh Portland Cement Co.....169

Leschen, A., & Sons Rope Co....324

Le Valley-Vitae Carbon Brush Co. 541

Lidgerwood Mfg. Co. 309

Life Saving Devices Co. 589

Light Railway Equipment Co....395

Link-Belt Co. 103, 279

Litchfield Foundry & Machine Co.310

Lobdell Car Wheel Co.......346, 347

Mc

McCullough, W. T., Electric Co. 532

McKay, James, Co..............361

McClave-Brooks Co. 198

McCoy-Brandt Machinery Co....373

M

Macbeth-Evans Glass Co. 582

Macomber & Whyte Rope Co....325

Main Belting Co. 121

Malcolmson Briquet Engineering Co. 142

Mancha Storage Battery Locomotive Co. 467

Manierre Engineering & Machinery Co. 136

Mannesmann Light Co. of America, Inc. 578

Mashek Engineering Co. 143

Michigan Pipe Co. 444

Miller-Owen Electric Co., Inc....374

Milwaukee Locomotive Mfg. Co...476

Mine Safety Appliances Co......590

Miners' Supply Co. 572

Mines Otolok Check Co., Inc., The.364

Mitchell, W. K., & Co., Inc.......214

Moloney Electric Co. 548

Monarch Refillable Fuse Co......545

Montgomery Coal Washing & Mfg. Co. 108

Moon, George C., Co., Inc.......326

Morgan-Gardner Electric Co.461, 494

Morris Machine Works 434

Morrow Mfg. Co. 105

N

National Roofing Co. 162, 163

National Tube Co............446, 447 448, 449, 450, 451, 452, 453, 454, 455

National Valve & Mfg. Co.......215

New Jersey Car Spring & Rubber Co. 240

New York & New Jersey Lubricant Co. 256

New York Belting & Packing Co.241

New York Cordage Co...........244

Nicholson, W. H., & Co..........234

Nixon Mining Drill Co...........616

North American Construction Co.168

Northeastern Co., The...........159

Nuttall, R. D., Co.................482

(Continued on Next Page)

Alphabetical List of Firms Catalogued—Continued

O

Ohio Brass Co. 524
Ohio Grease Co., The....254, 255
Orenstein-Arthur Koppel Co. 350
Osborn Machine Co., The....319
Ottumwa Box Car Loader Co....137

P

Patterson, W. F.... 74
Pease, C. F., Co., The....80
Peerless Rubber Mfg. Co....242
Pennsylvania Casting & Machine Works 473
Pennsylvania Crusher Co. 139
Permutit Company, The 217
Philadelphia Storage Battery Co.472
Phillips Mine & Mill Supply Co. 128, 351
Pittsburgh Carbon Brush Co....542
Pittsburgh Coal Washer Co.106, 107
Pittsburgh Filter Mfg. Co....218
Pittsburgh Harness Supply Co..609
Pittsburgh Knife & Forge Co....362
Pittsburgh Reinforced Brazing & Machine Co. 375
Platt Iron Works 435
Pneumelectric Machine Co. 311, 436, 497, 501
Porter, H. K., Co....474
Post-Glover Electric Co. 533
Pressed Steel Car Co....352, 353
Provident Life & Casualty Co....596
Prox, Frank, Co. 506, 507
Punxsutawney Drilling & Contracting Co. 68

Q

Quaker City Rubber Co....243

R

Rand, McNally & Co. 619
Randolph-Means Co. 81
Reineke-Wagner Pump & Supply Co. 437
Remaly Mfg. Co., Inc....125
Renton, William, Inc. 248
Richards, J. R. 69
Richardson & Co., Inc. 389
Ridgway Dynamo & Engine Co. 212, 213
Roberts & Schaefer Co. 109
Robins Conveying Belt Co. 122
Robinson Ventilating Co....276, 277
Roebling's, John A., Sons Co.327, 519
Royer & Zweibel 318

S

S. K. F. Ball Bearing Co....481
Sackett Mine Supply Co., The...534
Safety First Supply Co..591, 592, 593
Sanford-Day Iron Works....354
Scaife, Wm. B., & Sons Co....219
Scottdale Machine & Mfg. Co. 110, 174
Scranton Electric Construction Co. 502
Simmons, John, Co. 585
Simonds, G. L., & Co. 203
Sims Company, The 223
Somers, Fitler & Todd Co....369
Southern Coupon Co. 620
Southern Wheel Co. 355
Standard Chain Co....363
Standard Railway Supply Co....525
Standard Scale & Supply Co....132
Standard Wood Pipe Co. 445
Star Mfg. Co....356
Stephens-Adamson Mfg. Co.118, 119
Sterling Equipment & Supply Co.220
Stonehouse Steel Sign Co., The...594
Stromberg-Carlson Telephone Mfg. Co. 538
Stuart, James, & Cooke, Inc....82
Sullivan Machinery Co. 70, 495
Sweet's Steel Co. 382

T

Tamaqua Mfg. Co. 126
Templeton, Kenly & Co., Ltd....607
Texas Company, The....330, 331
Thermoid Rubber Co. 320
Toledo Pipe Threading Machine Co. 370
Tool Steel Gear & Pinion Co....483
Tracy, Bertrand P. 508
Tranter Mfg. Co. 604
Turner, Laurin H. & Co. 284

U

Union Carbide Sales Co. 586
Union Electric Co. 535
Union Iron Works. 193
United States Powder Co. 571
United States Rail Co....383
Universal Lubricator Co. 235

V

Valley Iron Works 199
Van Dorn & Dutton Co., The....484
Vogt, Henry, Machine Co. 194
Vulcan Iron Works 278, 312, 475

W

Walsh & Weidner Boiler Co....195
Warwood Tool Co. 617
Waterbury Company 328
Watt Mining Car Wheel Co....357
Webster Mfg. Co. 111
Weir Frog Co. 396
Wellman-Seaver-Morgan Co. 313
West Virginia Rail Co., The....384
Western Electric Co....536, 537
Westinghouse Air Brake Co....225
Westinghouse Electric & Mfg. Co. 135, 208, 209, 317, 439, 464, 526
Wharton, Wm., Jr., & Co., Inc....397
Whitcomb, Geo. D., Co....468, 477
Wickes Boiler Co., The....196
Williams Improved Stretcher Co.595
Williams Patent Crusher & Pulverizer Co. 140, 141
Wilmot Engineering Co. 127
Winslow Government Standard Scale Works, Inc....133
Winterer, Herman L....376
Wisconsin Bridge & Iron Co....112
Witherbee Igniter Co....579
Wolf Safety Lamp Co. of America, Inc. 581
Wright Wire Co. 329

Y

Youngstown Steel Car Co....358

Alphabetical List of Firms Catalogued, giving List of Branch Offices, Representatives and Agencies

A

AETNA EXPLOSIVES COMPANY, INC. 558-559
120 Broadway, New York, N. Y.
Branch Offices:
Ashley, Pa.
Birmingham, Ala.
Buffalo, N. Y.
Chicago, Ill.
Des Moines, Ia.
Duluth, Minn.
Hazleton, Pa.
Louisville, Ky.
New Orleans, La.
Norristown, Pa.
Pittsburgh, Pa.
Pottsville, Pa.
St. Louis, Mo.

ALADDIN HOME COMPANY, THE.168
Bay City, Mich.

ALDRICH PUMP COMPANY, THE 412-413
Allentown, Pa.
Branch Offices:
Chicago, Ill.—W. N. Flickinger, 636 McCormick Bldg.
El Paso, Texas—Carroll Helmick, 121 San Francisco St.
Pittsburgh, Pa.—Crawford & Cameron, 2218 Farmers Bank Bldg.
Agencies:
Birmingham, Ala.—C. B. Davis Engineering Co., Brown-Marx Bldg.
Bluefield, W. Va.—Superior Supply Co.
Butte, Mont.—S. P. Wright & Co.
Denver, Colo.—Hendrie & Bolthoff Mfg. & Supply Co.
Huntington, W. Va.—Huntington Supply & Equipment Co.
Los Angeles, Cal.—Harron, Rickard & McCone.
St. Louis, Mo.—Reeves & Skinner Machinery Co.
St. Paul, Minn.—Robinson, Cary & Sands Co.
San Francisco, Cal.—Harron, Rickard & McCone.
Sherman, Texas—Hardwicke-Etter Co.
Spokane, Wash.—Hallidie Co.
Canadian Offices:
Cobalt, Ont., Can.—Grodwards Co.
Montreal, Quebec, Can.—Peacock Bros.

ALEXANDER CAR REPLACER MFG. CO. 485
Scranton, Pa.
Agencies:
Altoona, Pa.—Standard Supply & Equip. Co.
Boston, Mass.—Sherburne & Co.
Cincinnati, O.—Kinsey, E. A. Co.
Cincinnati, O.—Queen City Supply Co.
Chicago, Ill.—Crerar, Adams & Co.
Corry, Pa.—Climax Mfg. Co.
Duluth, Minn.—Marshall, Wells Hdw. Co.
Huntington, W. Va.—Banks Supply Co.
Kalamazoo, Mich.—Kalamazoo Ry. Supply Co.
Lima, O.—Lima Loco. Works.
New York, N. Y.—Fox Bros. & Co.
New York, N. Y.—Manning, Maxwell & Morre.
New York, N. Y.—Oliver Bros. Purchasing Co.
Philadelphia, Pa.—Standard Supply & Equip. Co.
Pittsburgh, Pa.—Biddle Purchasing Co.
Pittsburgh, Pa.—Frick & Lindsay Co.
Pittsburgh, Pa.—Pittsburgh Gauge & Supply Co.
Pittsburgh, Pa.—Standard Supply & Equip. Co.
Pittsburgh, Pa.—Somers, Fitler & Todd Co.
Portland, Ore.—Railway Equip. Co.
St. Louis, Mo.—Handlan-Buck Mfg. Co.
St. Louis, Mo.—Zelnicker Supply Co.
San Francisco, Cal.—Eccles & Smith Co.
Seattle, Wash.—Hofius Steel & Equip. Co.
Seattle, Wash.—Railway Supply Co.
Wilkes-Barre, Pa.—Vulcan Iron Wks.
Canadian Offices:
Montreal, Can.—F. H. Hopkins & Co.
Montreal, Can.—Mussels Limited.

ALLEN & GARCIA COMPANY......93
955 McCormick Bldg., Chicago, Ill.

ALLISON COUPON CO.............618
Indianapolis, Ind.

ALLIS-CHALMERS MANUFACTURING CO..........204-205-299-411
Milwaukee, Wis.
Branch Offices:
Atlanta, Ga.—1104 Healey Bldg.
Boston, Mass.—50 Congress St.
Buffalo, N. Y.—Elicott Square Bldg.
Chicago, Ill.—Peoples Gas Bldg.
Cincinnati, O.—First National Bank Bldg.
Cleveland, O.—Schofield Bldg.
Dallas, Texas.—Sumpter Bldg.
Denver, Colo.—First National Bank Bldg.
Detroit, Mich.—Ford Bldg.
Duluth, Minn.—Alworth Bldg.
El Paso, Texas.—2900 San Diego St.
Indianapolis, Ind.—516 Traction Terminal Bldg.
Kansas City, Mo.—Waldheim Bldg.
Los Angeles, Cal.—Title Insurance Bldg.
Milwaukee, Wis.—West Allis, Wis.
Minneapolis, Minn. — Corn Exchange Bldg.
New Orleans, La. — Maison Blanche Bldg.
New York, N. Y.—50 Church St.
Philadelphia, Pa. — 903 Pennsylvania Bldg.
Pittsburgh, Pa.—Frick Bldg.
Portland, Ore.—92 First St.
St. Louis, Mo. — Railway Exchange Bldg.
Salt Lake City, Utah.—Kearns Bldg.
San Francisco, Cal.—Rialto Bldg.
Seattle, Wash.—115 Jackson St.
Toledo, O.—Ohio Bldg.
Canadian Representative:
Toronto, Ont.—Canadian Allis-Chalmers, Limited.

AMERICAN BLOWER CO.. .267-268-269
Detroit, Mich.
Branch Offices:
Atlanta, Ga.
Chicago, Ill.
Dallas, Texas.
Des Moines, Ia.
Denver, Colo.—Hendrie & Bolthoff.
Indianapolis, Ind.
Kansas City, Mo.
Minneapolis, Minn.
New York, N. Y.
Philadelphia, Pa.
Pittsburgh, Pa.
Rochester, N. Y.
St. Louis, Mo.
Salt Lake City, Utah.
Seattle, Wash.

AMERICAN CAR & FOUNDRY CO. 336-337
Chicago, Ill.—421 Railway Exchange Bldg.
New York, N. Y.—165 Broadway.
St. Louis, Mo.—915 Olive St.
Branch Offices:
Berwick, Pa.
Buffalo, N. Y.—Clinton and Babcock Sts.
Detroit, Mich.—Russell and Ferry.
Huntington, W. Va.—First Ave. and 23rd St.
Indianapolis, Ind.—1503 Kentucky Av.
Jeffersonville, Ind.—Missouri Ave.
Madison, Ill.
Memphis, Tenn.
Milton, Pa.—Arch St.
Pittsburgh, Pa.—2221 Farmers Bank Bldg.
St. Charles, Mo.
Terre Haute, Ind.—10½ and Crawford Sts.
Wilmington, Del.

AMERICAN CAST IRON PIPE CO. 442-443
Birmingham, Ala.
General Sales Office:
Chicago, Ill. — First National Bank Bldg.
Branch Sales Offices:
Columbus, O.—607 New Hayden Bldg.
Dallas, Texas—1217 Praetorian Bldg.
Kansas City, Mo.—716 Scarritt Bldg.
Minneapolis, Minn. — 840 Plymouth Bldg.
New York, N. Y.—1 Broadway.
San Francisco, Cal.—461 Market St.

AMERICAN STEAM GAUGE & VALVE MFG. CO................226
Camden St., Boston, Mass.
Branch Offices:
Atlanta, Ga.
Chicago, Ill.
New York, N. Y.
Pittsburgh, Pa.

AMERICAN STEAM PUMP CO.....414
Battle Creek, Mich.
Branch Offices:
Chicago, Ill.—1220 Monadnock Bldg.
New York, N. Y.—17 Battery Place.
Sales Offices:
Cleveland, O.—Dravo-Doyle Co.
Indianapolis, Ind.—Dravo-Doyle Co.
Philadelphia, Pa.—Dravo-Doyle Co.
Pittsburgh, Pa.—Dravo-Doyle Co.

AMERICAN STEEL & WIRE CO. 321-516
208 South La Salle St., Chicago, Ill.
Sales Offices:
Baltimore, Md.—32 South Charles St.
Birmingham, Ala.—Brown-Marx Bldg.
Boston, Mass.—120 Franklin St.
Buffalo, N. Y.—337 Washington St.
Chicago, Ill.—208 South La Salle St.
Cincinnati, O.—Union Trust Bldg.
Cleveland, O.—Western Reserve Bldg.
Denver, Colo. — First National Bank Bldg.
Detroit, Mich.—Foot of First St.
New York, N. Y.—30 Church St.
Oklahoma City, Okla.—State National Bank Bldg.
Philadelphia, Pa.—Widener Bldg.
Pittsburgh, Pa.—Frick Bldg.
St. Louis, Mo.—Third National Bank Bldg.
St. Paul-Minneapolis, Minn. — Pioneer Bldg., St. Paul.
Salt Lake City, Utah.—Walker Bank Bldg.
Wilkes-Barre, Pa.—Miners Bank Bldg.
Worcester, Mass.—94 Grove St.
Pacific Coast Representatives:
Los Angeles, Cal.—U. S. Steel Products Co.
Portland, Ore.—U. S. Steel Products Co.
San Francisco, Cal.—U. S. Steel Products Co.
Seattle, Wash.—U. S. Steel Products Co.

ANTHRACITE SEPARATOR CO....113
Hazleton, Pa.
Branch Office:
Chicago, Ill.—Bituminous Coal Washing Co., 1114 McCormick Bldg.

ARMSTRONG CORK & INSULATION CO. 216
Pittsburgh, Pa.
Branch Offices:
Atlanta, Ga.—1202 Candler Bldg.
Boston, Mass.—84 North St.
Chicago, Ill.—320 West Randolph St.
Cincinnati, O.—18 East Third St.
Cleveland, O. — 404 American Trust Bldg.
Dallas, Texas.—Busch Bldg.
Detroit, Mich.—1101 Chamber of Commerce Bldg.
Indianapolis, Ind.—415 John Murphy Bldg.
Kansas City, Mo.—529 Reserve Bank Bldg.
Minneapolis, Minn. — 937 Plymouth Bldg.
New York, N. Y.—50 Church St.
Rochester, N. Y.—808 Powers Bldg.
St. Louis, Mo.—Third and Elm Sts.
Agencies:
Baltimore, Md.—John R. Livezey, 9-11 Commerce St.
Great Falls, Mont.—D. E. Fryer & Co., 321 Ford Bldg.
Los Angeles, Cal.—C. M. Gay & Son, 335 Towne Ave.
New Orleans, La.—H. T. Steffee, 605-7 Baronne St.
Philadelphia, Pa.—John R. Livezey, 1933 Market St.
Portland, Ore.—Gillon-Chambers Co., 66 North Front St.
San Francisco, Cal.—M. V. Van Fleet, Sharon Bldg., 120 Jessie St.
Seattle, Wash.—D. E. Fryer & Co., 305 Lumber Exchange Bldg.
Spokane, Wash.—D. E. Fryer & Co., 604 Paulsen Bldg.

(Continued on Next Page)

List of Firms Catalogued, Branch Offices, Representatives and Agencies---Cont

Tacoma, Wash.—D. E. Fryer & Co., National Realty Bldg.

Canadian Offices:

Montreal, Que., Can.—Armstrong Cork & Insulation Co., Ltd., 902 McGill Bldg.
Toronto, Ont., Can.—Armstrong Cork & Insulation Co., Ltd., 214 King St. East.

ARMSTRONG MFG. CO. 197
252 Ludlow Ave., Springfield, O.

ASBESTOS PROTECTED METAL CO. 164
First Nat. Bank Bldg., Pittsburgh, Pa.

Branch Offices:

Atlanta, Ga.—J. R. Nichols, 1323 Hurt Bldg.
Baltimore, Md.—O. O. Robinson, 415 Equitable Bldg.
Boston, Mass.—P. L. Jepson, 78 Equitable Bldg.
Buffalo, N. Y.—H. W. Littlefield, 918 Mutual Life Bldg.
Chicago, Ill.—Steel Sales Corp., Adams and Jefferson Sts.
Cincinnati, O.—E. G. Irwin, 629 Union Trust Bldg.
Cleveland, O.—Arthur B. Shepard, 603 Union Bldg.
Dallas, Texas.—T. R. Galey, 905 Preatorian Bldg.
Denver, Colo.—Davidson, O. H. Equip. Co., 1633 Tremont St.
Detroit, Mich. — M. W. Taber, 1950 Penobscot Bldg.
El Paso, Texas. — F. B. Hitchings, Mills Bldg.
Galveston, Texas.—J. H. Hedges, 320-1 Security Bldg.
Houston, Texas. — Harry H. Hedges, 410 First National Bank Bldg.
Kansas City, Mo.—Sprague, J. P. Co., Rialto Bldg.
Little Rock, Ark.—W. L. Clippard, 123 Louisiana Ave.
Milwaukee, Wis.—J. D. McCord, Majestic Bldg.
Minneapolis, Minn.—Wm. H. Hale & Co., 1042 McKnight Bldg.
New Orleans, La. — Jahncke, Fritz, Inc., 14 Howard Ave.
New York, N. Y. — W. J. Harris, 92 Beaver St.
New York, N. Y.—P. M. Stewart, 1206 Exchange Court Bldg., 52 Broadway.
Omaha, Neb. — H. M. Orschel Co., 1102-4 Farnum St.
Philadelphia, Pa.—F. C. Anderson, 1017 Real Estate Trust Bldg.
Portland, Ore. — P. L. Cherry & Co., Inc., Lumber Exchange Bldg.
St. Louis, Mo.—St. Louis Roofing Co., 2124 Market St.
San Francisco, Cal. — Asbestos Protected Metal Co., 424-426 Holbrook Bldg.
Salt Lake City, Utah.—O. H. Davidson Equip., Walker Bank Bldg.
Seattle, Wash.—S. W. R. Dally, Globe Bldg.
Scranton, Pa.—F. H. Coffin & Co., Board of Trade Bldg.

Canadian Office:

Montreal, P. Q. — Canadian Asbestos Co., 42 Youville Square.

ASHTON VALVE CO, THE 227
271 Franklin St., Boston, Mass.

Branch Offices:

Chicago, Ill.—The Ashton Valve Co., 174 North Market St.
New York, N. Y.—The Ashton Valve Co., 128 Liberty St.

Agents:

Atlanta, Ga.—Earl F. Scott, Candler Bldg.
Baltimore, Md.—615 Equitable Bldg.
Birmingham, Ala.—J. I. Blount & Co., Brown-Marx Bldg.
Buffalo, N. Y.—J. H. Ruckel & Son, 81 Main St.
Cincinnati, O. — Doermann-Roehrer Co., 325 East Third St.
Cleveland, O.—Tomlinson Steam Specialty Co., Wade Bldg.
Detroit, Mich. — Coon-DeVisser Co., Ford Bldg.
El Paso, Texas.—George S. Thomson, 406 San Francisco St.
New Orleans, La.—A. M. Lockett & Co., Ltd., 533 Baronne St.
Philadelphia, Pa.—Schade Valve Mfg. Co., 2528 North American St.
Pittsburgh, Pa.—James Bonar & Co., Park Bldg.
Rochester, N. Y.—Howe & Bassett, 23 Stillson St.
St. Louis, Mo. — Defender Automatic Regulator Co., 507 Oriel Bldg.
St. Paul, Minn.—R. E. Stanton, 367 Prior Ave.

San Antonio, Texas.—Higgins & Co., 212 Losoya St.
San Francisco, Cal.—Chas. M. Bailey, 505 Mission St.
Seattle, Wash.—Steam Supply & Rubber Co., 79 Washington Ave.

Canadian Agents:

Montreal, Can.—H. L. Peiler & Co., 380 St. James St.
Toronto, Ont., Can.—H. L. Peiler, 311 Kent Bldg.

ATLANTIC REFINING COMPANY, THE 250
3144 Passyunk Ave., Philadelphia, Pa.

Branch Offices:

Allentown, Pa.
Altoona, Pa.
Bellefonte, Pa.
Bethlehem, Pa.
Bloomsburg, Pa.
Butler, Pa.
Carbondale, Pa.
Chambersburg, Pa.
Chester, Pa.
Clearfield, Pa.
Coatesville, Pa.
Connellsville, Pa.
Danville, Pa.
Dubois, Pa.
Easton, Pa.
Erie, Pa.
Greensburg, Pa.
Harrisburg, Pa.
Hazleton, Pa.
Huntingdon, Pa.
Indiana, Pa.
Johnstown, Pa.
Kittanning, Pa.
Lancaster, Pa.
Latrobe, Pa.
Lebanon, Pa.
Lock Haven, Pa.
McKeesport, Pa.
Meadville, Pa.
Mt. Pleasant, Pa.
New Brighton, Pa.
New Castle, Pa.
New Kensington, Pa.
Norristown, Pa.
Oil City, Pa.
Philadelphia, Pa.
Philipsburg, Pa.
Pittsburgh, Pa.
Pittston, Pa.
Pottstown, Pa.
Pottsville, Pa.
Punxsutawney, Pa.
Reading, Pa.
Ridgway, Pa.
Scranton, Pa.
Shamokin, Pa.
Sharon, Pa.
Shenandoah, Pa.
Somerset, Pa.
Spangler, Pa.
Sunbury, Pa.
Titusville, Pa.
Uniontown, Pa.
Warren, Pa.
Washington, Pa.
Waynesburg, Pa.
Wellsboro, Pa.
West Chester, Pa.
Wilkes-Barre, Pa.
Williamsport, Pa.
Wilmington, Del.
York, Pa.

ATLAS POWDER CO. 560-561
Wilmington, Del.

Branch Offices:

Allentown, Pa.—Hunsicker Bldg.
Birmingham, Ala. — 724 Brown-Marx Bldg.
Boston, Mass.—704 Unity Bldg.
Houghton, Mich.—Masonic Bldg.
Joplin, Mo.—Cosgrove Bldg.
Kansas City, Kan.—520 R. A. Long Bldg.
Knoxville, Tenn. — Holston National Bank Bldg.
McAlester, Okla.—106 E. Grand Ave.
Nashville, Tenn.—Stahlman Bldg.
New Orleans, La.—1409 Whitney Central National Bank Bldg.
New York, N. Y.—3113 Equitable Bldg.
Philadelphia, Pa.—813 Harrison Bldg.
Pittsburg, Kan.—719 North Broadway.
Pittsburgh, Pa.—2419 Farmers Bank Bldg.
Pottsville, Pa.—Thompson Bldg.
St. Louis, Mo.—1401 Wright Bldg.
Wilkes-Barre, Pa.—Peoples Bank Bldg.

AUSTIN POWDER CO. 557
1229 Rockefeller Bldg., Cleveland, O.

Branch Offices:

Chicago, Ill. — Steger Bldg., 28 East Jackson Blvd.
Detroit, Mich.—423 Trussed Concrete Bldg., 58-60 La Fayette Ave.
St. Louis, Mo.—1548 Pierce Bldg.

AUTOMATIC RECLOSING CIRCUIT BREAKER CO. 539
38 North Water St., Columbus, O.

Agents:

Birmingham, Ala. — McClary-Jamison Machine Co.
Bluefield, W. Va.—A. Fred Phelps, Box No. 443.
Detroit, Mich.—Louis J. Kaiser, 146 Park Blvd.
Knoxville, Tenn. — Tennessee Mill & Mine Supply Co.
Milwaukee, Wis.—T. Weiss, 1420 Majestic Bldg.
New York, N. Y.—Jos. B. Noros, 50 Church St.
Philadelphia, Pa.—Wm. Miller Tompkins, 4813 Haverford Ave.
Pittsburgh, Pa. — Iron City Electric Co.
Pittsburgh, Pa.—Railway & Industrial Engr. Co., Peoples Bank Bldg.

B

BALL ENGINE COMPANY 210
Erie, Pa.

Branch Offices:

Chicago, Ill.—W. A. Kreider, Monadnock Bldg.
New York, N. Y.—L. Cappelston, 39 Courtland St.
Cleveland, O.—Dravo-Doyle Co.
Indianapolis, Ind.—Dravo-Doyle Co.
Philadelphia, Pa.—Dravo-Doyle Co.
Pittsburgh, Pa.—Dravo-Doyle Co.

BARRETT COMPANY, THE 156
17 Battery Place, New York, N. Y.

Branch Offices:

Birmingham, Ala.
Boston, Mass.
Chicago, Ill.
Cincinnati, O.
Cleveland, O.
Duluth, Minn.
Kansas City, Mo.
Louisville, Ky.
Minneapolis, Minn.
Nashville, Tenn.
New Orleans, La.
Philadelphia, Pa.
Pittsburgh, Pa.
St. Louis, Mo.
Salt Lake City, Utah.
Seattle, Wash.

Canadian Representatives:

Montreal—Patterson Mfg. Co.
Toronto.—Patterson Mfg. Co.
Vancouver.—Patterson Mfg. Co.
Winnipeg.—Patterson Mfg. Co.
Halifax, N. S. — Carritte-Patterson Mfg. Co., Ltd.
St. John, N. B. — Carritte-Patterson Mfg. Co., Ltd.
Sydney, N. S. — Carritte-Patterson Mfg. Co., Ltd.

BECK & CORBITT IRON CO 598
St. Louis, Mo.

BOYLSTON STEAM SPECIALTY CO. 228
Chicago, Ill.

Baltimore, Md.—Morton McI. Dukehart, 100 Lafayette St. West.
Boston, Mass.—Paul R. Hodges, 15 India St.
Buffalo, N. Y.—Owen F. Ryan, 756 Washington St.
Cincinnati, O.—W. C. Green Specialty Co., 310 Providential Bank Bldg.
Cleveland, O. — Frederick Leonhard, 536 East 123rd St.
Dallas, Tex.—Geo. H. Greenway, H. E., 2521 Rose Ave.
Denver, Colo. — Howard H. Fielding, Boston Bldg.
Detroit, Mich. — Wm. F. McDonald Co., Dime Bank Bldg.
Indianapolis, Ind.—Weinshank & Fenstermaker, Hume-Mansure Bldg.
Milwaukee, Wis.—Fred H. Dorner, 436 Wells Bldg.
Minneapolis, Minn. — Morgan-Gerrish Co., Plymouth Bldg.
Pittsburgh, Pa.—James A. Robinson, 917 Empire Bldg.
St. Louis, Mo.—W. G. Christy, 901 Chemical Bldg.
San Francisco, Cal.—R. B. Guernsey & Co., 667 Mission St.
Seattle, Wash.—Vacuum Engineering & Specialty Co., C. H. Blackwell, Henry Building.

BOYTS, PORTER & CO. 415-416-417
Connellsville, Pa.

BRODERICK & BASCOM ROPE CO. 322
St. Louis, Mo.
(Factory, South Seattle, Wash.)

List of Firms Catalogued, Branch Offices, Representatives and Agencies---Cont.

Branch Office:
New York, N. Y.—76 Warren St.
Agents:
Birmingham, Ala.—Perry & Hamilton Sales Co.
Chicago, Ill.—Carpenter, George B. & Co.
New Orleans, La.—C. T. Patterson Co.
Pittsburgh, Pa. — Somers, Fitler & Todd Co.
Seattle, Wash.—Broderick & Bascom Loggers' Supply Co.

BROWNELL COMPANY, THE......188
Dayton, O.
Branch Offices:
Chicago, Ill.—925 Monadnock Bldg.
Cincinnati, O.—Queen City Supply Co.
Cleveland, O. — E. P. Bates, 409 Superior St.
Columbus, O.—Neff & Ancher.
Dallas, Texas. — Briggs-Weaver Machine Co.
Denver, Colo.—M. J. O'Fallon Supply Co.
New Orleans, La.—A. Baldwin & Co.
New York, N. Y.—L. R. Merritt & Co., 52 Vanderbilt Ave.
Norfolk, Va.—Porter & Moore Co.
Pittsburgh, Pa.—B. S. Rederer, 1503 First National Bank Bldg.
Richmond, Va.—Sydnor Pump & Well Co.
St. Louis, Mo.—401 Bank of Commerce Bldg.
St. Paul, Minn.—R. B. Whitacre & Co.
Salt Lake City, Utah. — Salt Lake Hardware Co.
Savannah, Ga.—Georgia Supply Co.
San Antonio, Tex.—San Antonio Machine & Supply Co.
San Francisco, Cal.—General Machinery & Supply Co.
Seattle, Wash.—Puget Sound Machinery Depot.
Sidney, O.—Rhinehard Smith.
Toledo, O. — Shaw-Kendall Engineering Co.
Wilmington, N. C.—Wilmington Iron Works.

BUCKEYE ROLLING MILL CO., THE 381
Steubenville, O.
Branch Offices:
Chicago, Ill. — Wilmer Wickersham, 1850 Peoples Gas Bldg.
Cleveland, O.—The Hamill-Hickox Co., Hickox Bldg.
Kansas City, Mo.—R. A. Long Bldg.
Knoxville, Tenn.—Webster & Co., Holston Bank Bldg.
Middlesboro, Ky.—Webster & Co.
New York, N. Y.—Hudson Terminal Bldg., 30 Church St.
St. Louis, Mo.—C. F. Hutchison, Suite 913, Federal Reserve Bank Bldg.

BUETTNER & SHELBURNE MACHINE CO. 504-505
South Third St., Terre Haute, Ind.
Agent:
Pittsburgh, Pa.—J. L. Goss, 1663 Jancey St.

BUFF & BUFF MFG. CO............76
Boston, Mass.
Branch Offices:
Chicago, Ill.—1742 Monadnock Bldg.
New York, N. Y.—50 Church St.
Agents:
Denver, Colo. — J. S. Lallie Inst. & Supply Co.
Duluth, Minn.—J. S. Ray & Co.
Houston, Tex. — Texas Blue Print & Supply Co.
Los Angeles, Cal.—Adolf Frese Optical Co.
New Orleans, La.—Kokosky & Co.
Pittsburgh, Pa.—R. K. Elliott Co.
San Francisco, Cal.—Frederick F Post Co.
Seattle, Wash.—A. E. Fuller.
Washington, D. C.—Ward & Co.
Canadian Agent:
Montreal, Can. — Canadian Asbestos Co.

BUFFALO FOUNDRY & MACHINE CO. 367
Buffalo, N. Y.
Branch Office:
New York, N. Y.—17 Battery Place.
Representatives:
Chicago, Ill.—Jos. T. Ryerson & Son.
San Francisco, Cal. — F. O. Stallman Supply Co.

BURNET COMPANY, THE.........332
69 South St., New York, N. Y.

BURTON POWDER CO.............566
501 Liberty Ave., Pittsburgh, Pa.
Branch Offices:
Chicago, Ill.
Clarksburg, W. Va.
Columbus, O.
Cumberland, Md.
Fostoria, O.
Grand Rapids, Mich.
Joliet, Ill.
Ladysmith, Wis.
Saginaw, Mich.

BYERS, A. M. COMPANY..........441
Pittsburgh, Pa.
Branch Offices:
Boston, Mass.—11 Sleeper St.
Chicago, Ill.—720 Fulton St.
New York, N. Y.—23 Sullivan St.

C

CABOT, SAMUEL, INC.............157
141 Milk St., Boston, Mass.
Branch Offices:
Chicago, Ill.—24 West Kinzie St.
New York, N. Y.—1133 Broadway.

C-A-WOOD-PRESERVER CO., INC. 158
St. Louis, Mo.
Branch Offices:
Atlanta, Ga.—Carter Electric Co.
Boston, Mass.—H. C. Good, 642 Tremont Bldg.
Chicago, Ill.—Webster Bldg.
Cleveland, O.—C. H. Hoyt & Son.
Dallas, Tex.—Southwestern Life Bldg.
Denver, Colo.—1550 Glenarm Bldg.
Havana, Cuba.—Thos. F. Turull.
Louisville, Ky.—Starks Bldg.
Los Angeles, Cal.—Marsh-Strong Bldg.
New Orleans, La. — C. T. Patterson Co., Ltd.
New York, N. Y.—56 Liberty St.
Pittsburgh, Pa.—207 Fulton Bldg.
Portland, Ore.—Ainsworth Bldg.
Providence, R. I.—R. J. Weaver & Co.
Salt Lake City, Utah.—Dooly Block.
San Francisco, Cal.—Rialto Bldg.
San Juan.—Korber & Co.

CALEBAUGH SELF-LUBRICATING CARBON CO. 540
1503 Columbia Ave., Philadelphia, Pa.

CAMBRIA STEEL COMPANY.......400
Widener Bldg., Philadelphia, Pa.
Branch Offices:
Atlanta, Ga.—Candler Bldg.
Boston, Mass.—Scollay Bldg.
Chicago, Ill.—McCormick Bldg.
Cincinnati, O.—Union Trust Bldg.
Cleveland, O.—Swetland Bldg.
Detroit, Mich.—Penobscot Bldg.
New York, N. Y.—City Investing Bldg.
Pittsburgh, Pa.—Oliver Bldg.
San Francisco, Cal.—Monadnock Bldg.
Salt Lake City, Utah. — Newhouse Bldg.
Seattle, Wash.—Colman Bldg.
St. Louis, Mo.—Chemical Bldg.

CAMERON, A. S., STEAM PUMP WORKS 418-419
11 Broadway, New York, N. Y.
Branch Offices:
Birmingham, Ala.—H. M. Perry, Mgr., American Trust Bldg.
Chicago, Ill.—M. P. Frutchey, Mgr., Peoples Gas Bldg.
Cleveland, O.—W. A. Armstrong, Mgr., Williamson Bldg.
Duluth, Minn.—S. N. Hill, Mgr., Providence Bldg.
Juneau, Alaska.—(Sub Branch).
Knoxville, Tenn. — L. F. Thompson, Mgr., Holston National Bank Bldg.
Los Angeles, Cal. — W. Blackburn, Mgr., 1036 Union Oil Bldg.
Houghton, Mich.—Thomas F. Lynch, Mgr., Citizens National Bank Bldg.
Philadelphia, Pa.—Phil. Weiss, Mgr., Commercial Trust Bldg.
Pittsburgh, Pa.—W. F. Gillies, Farmers Bank Bldg.
St. Louis, Mo.—D. M. Armstead, Mgr., 300 North Broadway.
San Francisco, Cal.—H. L. Terwilliger, Mgr., Rialto Bldg.
Seattle, Wash.—R. W. Douglass, Mgr., Colman Bldg.
Domestic Agents:
Boston, Mass. — Ingersoll-Sergeant Drill Co., R. K. Swift, Mgr., 32 Oliver St.
Butte, Mont.—Ingersoll-Rand Co., R. W. Rusterholz, Mgr., 100 E. Broadway.
Denver, Colo. — Hendrie & Bolthoff Mfg. & Supply Co.
El Paso, Tex.—Ingersoll-Rand Co., J. D. Foster, Genl. Mgr., 121 San Francisco St.
Mexico City, Mex.—Cadona No. 2.
New Orleans, La. — Hibernia Bank Bldg.
Salt Lake City, Utah.—Galigher Machinery Co., J. E. Galigher, Mgr., 224 S. W. Temple St.
Washington, D. C.—Home Life Bldg.
Canadian Agents:
Montreal, Que., Can.—Canadian Ingersoll-Rand Co., Ltd., E. W. Gillman, V. Pres.

CANCOS MANUFACTURING CO....236
Philadelphia, Pa.
Agencies:
Baltimore, Md. — E. A. Micoll, 33 Franklin Bldg.
Boston, Mass. — J. J. Sullivan, 170 Summer St.
Pottsville, Pa.—J. C. Fitzgibbon, 324 Arch St.

CATARACT REFINING & MFG. CO. 251
1416 Marine Bank Bldg., Buffalo, N. Y.
Branch Offices:
Chicago, Ill.—327 South LaSalle St.
Detroit, Mich.—532 Hart Ave.
New York, N. Y.—17 Battery Place.
San Francisco, Cal.—199 First St.
Canadian Office:
Toronto, Can.—86 Don Esplanade.

CEMENT GUN CO., INC............75
30 Church St., New York, N. Y.

CHANDLER & TAYLOR CO........189
Indianapolis, Ind.
Branch Offices:
Chicago, Ill.—C. S. Buell, Mgr., 1641 Monadnock Bldg.
New York, N. Y.—J. Kilshaw, Mgr., 39 Cortlandt St.
Agencies:
Bloomington, Ill. — Keiser-Van Leer Co.
Danville, Ill.—Robt. Holmes & Bros.
Denver, Colo.—Hendrie & Bolthoff Co.
East Liverpool, O.—Patterson Foundry & Machine Co.
El Paso, Tex. — El Paso Foundry & Machine Co.
Jacksonville, Fla.—Farquhar Machinery Co.
Joplin, Mo.—McNeal Machinery Co.
Little Rock, Ark.—C. E. Rosenbaum Machinery Co.
Memphis, Tenn.—Chickaway Machine & Foundry Co.
New Orleans, La.—A. M. Locket & Co.
Ocalo, Fla.—McIver & MacKay.
Owensboro, Ky.—Wright Machine Co.
Portland, Ore.—W. L. Blake & Co.
Philadelphia, Pa.—National Supply & Equipment Co.
Salt Lake City, Utah.—Galigher Machinery Co.
San Francisco, Cal.—H. J. Lyons Co.
Seattle, Wash.—Washington Machinery & Supply Co.
Shreveport, La. — W. K. Henderson Iron Works & Supply Co.
Van Wert, O.—Spayd Bros.
Waco, Tex.—D. June Machinery Co.
Washington, D. C. — L. C. Holmes, Curay Bldg.

CHEESMAN & ELLIOT..............160
100 Williams St., New York, N. Y.
Agents:
Brooklyn, N. Y.—Norman Elliott, 639 Kent Ave.
Kirkville, N. Y.—J. Frank Case.
Lancaster, Pa.—Henry M. Schroeder.
Punxsutawney, Pa.—J. A. Whiteman.
Williamsport, Pa.—B. T. Epler, East Church St.

CHERRY TREE MACHINE CO.....302
Cherry Tree, Pa.

CINCINNATI FROG & SWITCH CO.390
Cincinnati, Ohio.

CLEVELAND ARMATURE WORKS 549
Cleveland, Ohio.

CLINTON SWITCH CO.............391
Clinton, Ind.

CLING-SURFACE COMPANY.......246
Buffalo, N. Y.
Branch Offices:
Boston, Mass.—170 Summer St.
Chicago, Ill.—301 Sharples Bldg.
New York, N. Y.—39 Cortland St.
St. Louis, Mo.—915 Security Bldg.

CLOW, JAMES B., & SONS......442-443
Chicago, Ill.
Eastern Office:
New York, N. Y.—17 Battery Place.

List of Firms Catalogued, Branch Offices, Representatives and Agencies---Cont.

COLONIAL SUPPLY CO....599-600-601
412-414 First Ave., Pittsburgh, Pa.

COMBUSTION ENGINEERING CORPORATION 200-201
11 Broadway, New York, N. Y.
Branch Offices:
Atlanta, Ga.
Birmingham, Ala. — Deiser-Geismer Engineering Co.
Boston, Mass.—Schumaker-Santry Co.
Chicago, Ill.—Fisher Bldg.
Hazleton, Pa.—Market Bank Bldg.
Minneapolis, Minn.—Pocock & Pollard Co.
Philadelphia, Pa.—718 Lincoln Bldg.
Pittsburgh Pa.—George J. Hagan, 401 Peoples Bank Bldg.
Salt Lake City, Utah.—P. O. Box 785.

CONCORDIA SAFETY LAMP CO. THE 575
Fulton Bldg., Pittsburgh, Pa.
Main Office:
Dortmund, Germany.—Concordia Elektrizitaets Aktien Gesellschaft.

CONNELLSVILLE MFG. & MINE SUPPLY CO., THE....275-300-301-420
Connellsville, Pa.
Branch Offices:
Birmingham, Ala. — J. I. Blount, Brown-Marx Bldg.
Chicago, Ill.—Carl Heim, 918 Webster Bldg.

COPPUS ENGINEERING & EQUIPMENT CO. 202
Worcester, Mass.

CORDLEY & HAYES 573
7-9 Leonard St., New York, N. Y.
Branch Offices:
Boston, Mass.—164 Milk St.
Chicago, Ill. — Room 423, 180 North Dearborn St.
Denver, Colo.—1717 Arapahoe St.
San Francisco, Cal.—528 Hearst Bldg.
Tacoma, Wash.—California Bldg.

CRAWFORD & McCRIMMON CO..303
Brazil, Ind.

CROSS ENGINEERING CO........123
Carbondale, Pa.

CROUSE-HINDS COMPANY.......478
Syracuse, N. Y.
Branch Offices:
Boston, Mass.—D. C. Gidley, Mgr., 210 Devonshire St.
Chicago, Ill.—F. F. Skeel, Mgr., 417 South Dearborn St.
Cincinnati, O.—C. M. Crofoot, Mgr., 1 to 7 Fourth St., W.
New York, N. Y.—F. M. Hawkins, 30 Church St.
Agencies:
Mansfield, O.—The Ohio Brass Co.
Pittsburgh, Pa.—Union Elec. Co., 31 Terminal Warehouses.

CUTLER-HAMMER MFG. CO. THE 280-281
Milwaukee, Wis.
Sales Offices:
Boston, Mass. — The Cutler-Hammer Mfg. Co., Columbian Life Bldg.
Chicago, Ill. — The Cutler-Hammer Mfg. Co., Peoples Gas Bldg.
Cincinnati, O. — The Cutler-Hammer Mfg. Co., Gwynne Bldg.
Cleveland, O. — The Cutler-Hammer Mfg. Co., Schofield Bldg.
Kansas City, Mo. — Barber-Dwinnell Co., 600 East 15th St.
Los Angeles, Cal.—H. B. Squires, San Fernando Bldg.
New York, N. Y.—The Cutler-Hammer Mfg. Co., 50 Church St.
Philadelphia, Pa. — The Cutler-Hammer Mfg. Co., Commonwealth Bldg.
Pittsburgh, Pa.—The Cutler-Hammer Mfg. Co., Farmers Bank Bldg.
San Francisco, Cal. — H. B. Squires, 579 Howard St.
Seattle, Wash. — H. B. Squires, 309 First Ave., South.

D

D. & W. FUSE COMPANY.........517
Providence, R. I.
Agents:
Western Electric Co.
Atlanta, Ga.
Birmingham, Ala.
Boston, Mass.
Buffalo, N. Y.
Chicago, Ill.
Cincinnati, O.
Cleveland, O.
Dallas, Tex.
Denver, Colo.
Detroit, Mich.
Houston, Tex.
Indianapolis, Ind.
Kansas City, Mo.
Los Angeles, Cal.
Milwaukee, Wis.
Minneapolis, Minn.
Newark, N. J.
New Orleans, La.
New York, N. Y.
Oakland, Cal.
Oklahoma City, Okla.
Omaha, Neb.
Philadelphia, Pa.
Pittsburgh, Pa.
Portland, Ore.
Richmond, Va.
St. Louis, Mo.
St. Paul, Minn.
Salt Lake City, Utah.
San Francisco, Cal.
Savannah, Ga.
Seattle, Wash.
Representatives:
Boston, Mass. — Pettingell-Andrews Co.
Chicago, Ill.—Central Electric Co.
New York, N. Y.—A. Hall Berry, 97 Warren St.
Canadian Agencies:
Calgary, Alta.—General Supplies, Ltd.
Halifax, N. S.—John Starr, Son & Co., Ltd.
Montreal, Que.—Electrical Equipment Co.
Quebec, Que.—Mechanical Supply Co., Ltd
Toronto, Ont.—Factory Products, Ltd.
Vancouver, B. C.—Frank Darling & Co.
Winnipeg, Man. — Bentz-Richardson Co.

DAUM, A. F.......................543
1157 Hodgkiss St., Pittsburgh, Pa.

DAVIS INSTRUMENT MFG. CO., INC. 77
110 W. Fayette St., Baltimore, Md.

DAYTON TURBINE PUMP CO., THE 421
American Trust Bldg., Cleveland, O.

DE LAVAL STEAM TURBINE CO.428
Trenton, N. J.
Representatives:
Birmingham, Ala.—N. C. Walpole, 2015 First Ave.
Boston, Mass.—Power Equipment Co., 131 State St.
Charlotte, N. C.—Fraser-Purser Co., Commercial Bank Bldg.
Chicago, Ill.—De Laval S. T. Co., Peoples Gas Co.
Cleveland, O.—Dravo-Doyle Co., Citizens Bldg.
Duluth, Minn.—Rich, Raley & Co., 216 Providence Bldg.
Indianapolis, Ind.,—Dravo-Doyle Co. Merchants Bank Bldg.
Kansas City, Mo.—Thermal Efficiency Co., 716 Finance Bldg.
New Orleans, La.—Walter Castanedo, 1103 Hennen Bldg.
New York, N. Y.—Turbine Equipment Co., 50 Church Street.
Philadelphia, Pa. — Dravo-Doyle Co., Commercial Trust Bldg.
Pittsburgh, Pa. — Dravo-Doyle Co., Diamond Bank Bldg.
Salt Lake City, Utah—Utah Engr. & Mach. Co., 616 Newhouse Bldg.
San Francisco, Cal.—Herzog Elec. & Engr. Co., 150 Steuart St.
South Seattle, Wash.—G. B. Adair & Son Co., 514 First Ave.
Canadian Representatives:
Montreal, Can. — E. Laurie Co., 243 Bleury St.
Toronto, Can. — Turbine Equip. Co., Ltd., C. P. R. Bldg.
Vancouver, B. C.—Taylor Engr. Co., Ltd., Credit Foncier Bldg.

DEMPCY-DEGENER CO. 129
307 Fourth Ave., Pittsburgh, Pa.

DEMING COMPANY, THE 422-423-424-425-426-427
Salem, O.
Agencies:
Birmingham, Ala.—Moore & Handley Hdwe. Co.
Boston, Mass. — Chas. J. Jager Co., 13-15 Custom House St.
Charlotte, N. C. — Thos. B. Whitted, Realty Bldg.
Chattanooga, Tenn. — James Supply Co.
Chicago, Ill.—Henion & Hubbell, 217-221 North Jefferson St.
Denver, Colo. — Hendrie & Bolthoff Mfg. & Supply Co.
Detroit, Mich.—Kerr Machinery Co.
El Paso, Tex.—El Paso Foundry & Machine Co.
Kansas City, Mo. — English Tool & Supply Co.
Knoxville, Tenn.—C. M. McClung & Co.
Los Angeles, Cal.—Chas. H. Sheldon.
Nashville, Tenn. — John Bouchard & Sons Co., 11th & Harrison St.
New York, N. Y. — Ralph B. Carter Co., 152 Chambers St.
Philadelphia, Pa.—W. P. Dallett, 49 North Seventh St.
Pittsburgh, Pa.—Harris Pump & Supply Co., 320-322 Second Ave.
Providence, R. I.—Chas. J. Jager Co., 33 Canal St.
Richmond, Va.—Sydnor Pump & Well Co., 1310 East Main St.
Salt Lake City, Utah. — Salt Lake Hardware Co.
Seattle, Wash.—Perine Machinery Co.
Toledo, O.—Joseph L. Skeldon Engineering Co.
Washington, D. C.—Columbia Pump & Well Co., 520 Twelfth St.
Canadian Office:
Montreal, Que., Can. — Darling Bros., Ltd.

DETROIT GRAPHITE CO..........161
Detroit, Mich.
Branch Offices:
Birmingham, Ala.—412 Jefferson Co. Bank Bldg.
Boston, Mass.—94 Milk St.
Buffalo, N. Y.—871 Ellicott Square.
Chicago, Ill.—1646 Monadnock Block.
Cincinnati, O. — 705 Provident Bank Bldg.
Cleveland, O.—313 Schofield Bldg.
Kansas City, Mo.—318 Reliance Bldg.
New York, N. Y.—Equitable Bldg.
Philadelphia, Pa. — 808 Land Title Bldg.
St. Louis, Mo. — Railway Exchange Bldg.
San Francisco, Cal.—708 Mills Bldg.
Springfield, Mass.—Stearns Bldg.

DIAMOND MACHINE COMPANY..308
Monongahela, Pa.

DIXON, JOSEPH, CRUCIBLE CO..252
1020 Arch St., Philadelphia, Pa.
Branch Offices:
Atlanta, Ga.—J. Lewis, 328 Peachtree St.
Baltimore, Md.—J. A. Condit, Mgr., 616 Professional Bldg.
Boston, Mass.—H. Nealley, Mgr., 347 John Hancock Bldg.
Chicago, Ill. — D. A. Johnson, Mgr., 1323-27 Monadnock Block.
New York, N. Y. — John A. Ready, Mgr., 68 Reade St.
St. Louis, Mo.—H. A. Van Derslice, Mgr., 501 Victoria Bldg.
San Francisco, Cal. — A. C. Bowles, Mgr., 155 Second St.

DODGE SALES & ENGINEERING CO. 114-115-245-270-271
Mishawaka, Ind.
Agencies:
Atlanta, Ga.—28 S. Forsyth St
Boston, Mass.—137 Purchase St.
Chicago, Ill.—208 S. Clinton St.
Cincinnati, O.—126 W. Third St.
Dallas, Tex.—Busch Bldg.
Indianapolis, Ind. — Merchants Bank Bldg.
Minneapolis, Minn.—100 N. Third St.
New York, N. Y.—21 Murray St.
Newark, N. J.—170 Pine St.
Philadelphia, Pa.—815 Arch St.
Pittsburgh, Pa.—337 Second Ave.
Portland, Ore.—Link-Belt and Dodge Products Co.
Providence, R. I.—39 Mechanic St.
St. Louis, Mo.—408 N. Fourth St.
Seattle, Wash.—Link-Belt and Dodge Products Co.

DONALDSON IRON CO. 442-443
Emaus, Pa.

DRAEGER OXYGEN APPARATUS CO., THE 588
422 First Avenue, Pittsburgh, Pa.
Branch Offices:
New York, N. Y.—Wolf Safety Lamp Co. of America, Inc., 74 Washington St.
Salt Lake City, Utah.—H. H. Sanderson, 46 E. 4th South St.
San Francisco, Cal.—A. W. V. Johnson, Merchants Exchange Bldg.
San Francisco, Cal.—G. W. Johannsen, Merchants Exchange Bldg.

List of Firms Catalogued, Branch Offices, Representatives and Agencies---Cont

DRAKE, A. W., DRILLING CO.......65
712-713 Markle Bank Bldg., Hazleton, Pa.

DRAVO CONTRACTING CO., THE...71
Diamond Bank Bldg., Pittsburgh, Pa.

DUDLEY ELECTRIC & MACHINE CO. 550
7 E. Fayette St., Uniontown, Pa.
Branch Offices:
Clarksburg, W. Va.—422 N. 4th St.
South Brownsville, Pa.—Second St.

DUFF MFG. CO., THE.............606
Pittsburgh, Pa.
Branch Offices:
Atlanta, Ga.—Candler Bldg.
Chicago, Ill.—Peoples Gas Bldg.
Denver, Colo.—First Natl. Bank Bldg.
New York, N. Y.—50 Church St.
St. Paul, Minn.—Merchants Bank Bldg.
San Francisco, Cal.—Monadnock Bldg.

DUNCAN FOUNDRY & MACHINE WORKS 335
Alton, Ill.

DU PONT, E. I., DE NEMOURS & CO. 562-563-564-565
Du Pont Bldg., Wilmington, Del.
Branch Offices:
Birmingham, Ala.—C. J. Perry, Mgr., Brown-Marx Bldg.
Chicago, Ill. — Dale Bumstead, Mgr., McCormick Bldg.
Springfield, Ill.—G. K. Larrimore.
Denver, Colo. — W. C. Howard, Mgr., Central Savings Bank Bldg.
Duluth, Minn. — F. D. Orr, Mgr., Fidelity Bldg.
Huntington, W. Va. — C. W. Phellis, Mgr., Robson-Prichard Bldg.
New York, N. Y.—F. C. Peters, Mgr., 1816 Equitable Bldg.
Buffalo, N. Y.—E. N. McCarney, 510 Prudential Bldg.
Pittsburgh, Pa.—F. W. Pichard, Mgr., May Bldg., Cor. Fifth and Liberty Aves.
San Francisco, Cal. — C. A. Haight, Sales Agent, Ninth Floor, Chronicle Bldg.
Seattle, Wash.—J. H. Willman, Mgr., Maynard Bldg.
Portland, Ore. — George E. Willman, 230 Stark St.
Spokane, Wash. — Harry Witt, 523 First Ave.
St. Louis, Mo. — W. E. Pratt, Mgr., Wright Bldg.
Scranton, Pa.—Henry Belin, Jr., Pres., E. I. du Pont de Nemours & Co., of Penna.

DURABLA MANUFACTURING CO.237
114-118 Liberty St., New York, N. Y.
Branch Offices:
Chicago, Ill.—Fisher Bldg.
Pittsburgh, Pa.—Hartje Office Bldg.
Philadelphia, Pa.—27 Seventh St.

E

ECONOMY FUSE & MFG. CO......544
Kinzie and Orleans Sts., Chicago, Ill.
Branch Offices:
Atlanta, Ga.—1423 Empire Bldg.
Buffalo, N. Y.—1205 Electric Bldg.
Detroit, Mich.—1406 Majestic Bldg.
Cincinnati, O.—Greenwood Bldg.
Cleveland, O.—715 Citizens Bldg.
Pittsburgh, Pa.—2223 Farmers Bank Bldg.
New York, N. Y.—154 Nassau St.
St. Louis, Mo.—301 Frisco Bldg.

EDISON STORAGE BATTERY CO. 469-576
232 Lakeside Ave., Orange, N. J.
Distributors:
Boston, Mass.
Chicago, Ill.
Detroit, Mich.
New Orleans, La.
New York, N. Y.
Los Angeles, Cal.
San Francisco, Cal.
Seattle, Wash.
Washington, D. C.

ELECTRIC CARRIER COMPANY..465
220 Broadway, New York, N. Y.

ELECTRIC RAILWAY EQUIPMENT CO. 520
Cincinnati, O.
Agents:
Birmingham, Ala. — McClary-Jemison Machine Co.
Bluefield, W. Va. — Superior Supply Co.
Charleston, W. Va.—Cooke & Wilson Co.
Chicago, Ill.—W. R. Garton Co., 11 S. Desplaines St.
Denver, Colo.—The O. H. Davidson Equip. Co.
El Paso, Tex.—The O. H. Davidson Equip. Co.
Jellico, Tenn.—Arthur L. Ware.
Knoxville, Tenn.—C. M. McClung & Co.
New York, N. Y. — J. G. Ripp, 30 Church St.
Pittsburgh, Pa.—Cooke-Wilson Electric Supply Co., Penn Ave. and Barbeau St.
St. Louis, Mo.—Grayson Railway Supply Co., 405 La Salle Bldg.
Salt Lake City, Utah. — The O. H. Davidson Equipment Co.

ELECTRIC SERVICE COMPANY, THE 551
212 Walnut St., Cincinnati, O.

ELECTRIC SERVICE SUPPLIES CO. 528-529
17th and Cambria Sts., Philadelphia, Pa.
Branch Offices:
Atlanta, Ga.—1526 Candler Bldg.
Chicago, Ill.—Monadnock Bldg.
Agencies:
Birmingham, Ala. — McClary-Jemison Machinery Co.
Denver, Colo.—Franklin Sales Co.
Los Angeles, Cal.—Eccles & Smith Co.
Portland, Ore.—Eccles & Smith Co.
San Francisco, Cal.—Eccles & Smith Co.
Wheeling, W. Va.—Gee Electric Co.
Canadian Agencies:
Montreal, Que., Can.—Lymen Tube & Supply Co.
Toronto, Ont., Can.—Lymen Tube & Supply Co.

ELECTRIC STORAGE BATTERY CO., THE 470
Allegheny Ave. and Nineteenth St., Philadelphia, Pa.
Sales Offices:
Atlanta, Ga. — Cor. Peach Tree and Baker Sts.
Boston, Mass.—718-720 Beacon St.
Chicago, Ill.—Marquette Bldg.
Cleveland, O.—Citizens Bldg.
Denver, Colo.—Geo. D. Luther, Soliciting Agent, 1424 Wazee St.
Detroit, Mich. — 208 Hayward Bldg., 961-971 Woodward Ave.
New York, N. Y.—100 Broadway.
Pittsburgh, Pa.—Keystone Bldg.
Rochester, N. Y. — 184 Clinton Ave., South.
St. Louis, Mo.—H. B. Marshall, Soliciting Agent, Federal Reserve Bank Bldg.
San Francisco, Cal.—Geo. R. Murphy, Soliciting Agent, 1536-1556 Bush St.
Washington, D. C.—1828 L St., N. W.
Canadian Office:
Toronto, Ont., Can. — The Canadian General Electric Co., Ltd., King and Simcoe Sts.

ELLIOTT, B. K., COMPANY.........78
Pittsburgh, Pa.
Branch Office:
Cleveland, O.—Wm. F. Chew, Mgr., 737 Prospect Ave.

ELLIOT FROG & SWITCH CO.....392
301 S. Main St., East St. Louis, Ill.

ELMORE, G. H............116-117-429
Philadelphia, Pa.
Agencies:
Birmingham, Ala.—Keiser & Geismer Engr. Co., American Trust Bldg.
Chicago, Ill.—Roberts & Schaefer Co., McCormick Bldg.
Duluth, Minn. — Waldron & Woodbridge, Torrey Bldg.

EMPIRE CHEMICAL COMPANY...503
Huntington, W. Va.

ENTERPRISE FOUNDRY & MACHINE WORKS 339
Bristol, Tenn.
Representatives:
Birmingham, Ala.—Patton Sales Co., Brown-Marx Bldg.
Knoxville, Tenn.—Webster & Co., Holston Bank Bldg.
Philadelphia, Pa.—Thos. B. Whitney, 33 South Sixteenth St.
Pittsburgh, Pa.—Gellatly & Co., Union Bank Bldg.

EPPING-CARPENTER PUMP CO...430
Pittsburgh, Pa.
Branch Offices:
Baltimore, Md.—T. A. Wilkinson, 915 Equitable Bldg.
Birmingham, Ala.—John S. Jemison, First National Bank Bldg.
Chicago, Ill.—Western Pump & Engineering Co.
Cleveland, O.—328 Champlain Ave.
Huntington, W. Va.—Banks Supply Co.
New York, N. Y.—90 West St.
Philadelphia, Pa.—1108 Harrison Bldg.
Rochester, N. Y.—Alden L. Covill, 728 Granite Bldg.

EVERHART BRASS WORKS, THE..315
Scranton, Pa.

FAIRBANKS COMPANY, THE..130-229
Broome and Lafayette Sts., New York, N. Y.
Factories:
Binghamton, N. Y., Rome, Ga., St. Johnsbury, Vt.
Sales Offices:
Albany, N. Y.—360-366 Broadway.
Baltimore, Md. — Light and Lombard Sts.
Boston, Mass.—32-44 Pearl St.
Buffalo, N. Y.—108 Pearl St.
Hartford, Conn.—326-330 Pearl St.
Newark, N. J.—90-92 Academy St.
New Orleans, La.—900-926 Camp St.
New York, N. Y.—Broome and Lafayette Sts.
Paterson, N. J. — Market and Union Sts.
Philadelphia, Pa.—Arch and Seventh Sts.
Pittsburgh, Pa.—105 Wood St.
Providence, R. I.—54 South Water St.
Syracuse, N. Y.—Franklin and Walton Sts.

FAIRMONT MINING MACHINERY CO...94-95-96-97-98-99-398-399-431-498
Fairmont, W. Va.
Agencies:
Denver, Colo.—O. H. Davidson Equipment Co.
Huntington, W. Va.—Huntington Supply & Equipment Co.
Middlesboro, Ky.—Webster & Co.
Pittsburgh, Pa.—S. M. Casterline, 1218 Boyle St.
Terre Haute, Ind.—Smith Equipment Co.

FALK COMPANY, THE 314
Milwaukee, Wis.
Branch Offices:
Denver, Colo. — Denver Engineering Works.
New York, N. Y.—M. P. Fillingham, Hudson Terminal Bldg.
Pittsburgh, Pa.—W. O. Beyer, 1024 Park Bldg.
San Francisco, Cal.—F. W. Grimwood, Santa Marina Bldg.
Wilkes-Barre, Pa.—Vulcan Iron Wks.

FERRANTI CONTRACTING CO., THE, INC. 72
322 E. Norwegian St., Pottsville, Pa.

FLOOD CITY MFG. CO.........522-523
Johnstown, Pa.
Agency:
Scranton, Pa. — Francis H. Coffin & Co., Board of Trade Bldg.

FLORY, S., MFG. CO...........304-305
Bangor, Pa.
Agents:
Birmingham, Ala.—Chas. T. Lehman.
Chicago, Ill. — Clapp, Norstrum & Riley, 12 South Canal St.
Cincinnati, O.—Geo. B. Curd, Merchants Bldg.
Cleveland, O.—McKenna Co.
Huntington, W. Va. — Banks Supply Co.
Little Rock, Ark.—C. E. Rosenbaum Machinery Co.
Memphis, Tenn. —Riechman-Crosby Co.
New York, N. Y.—Lenher Engineering Co., 95 Liberty St.
Norfolk, Va.—Henry Walke Co.
Philadelphia, Pa.—Allen Engineering Co., 907 Penna. Bldg.
Pittsburgh, Pa.—Baird Machinery Co., 125 Water St.
Portland, Ore. — Zimmerman. Wells Brown Co.
San Francisco, Cal.—A. L. Young Machinery Co.

(Continued on Next Page)

List of Firms Catalogued Branch Offices Representatives and Agencies---Cont.

Canadian Agents:
Montreal, Que., Can.—Mussens, Ltd.
New Glasgow, N. S., Can.—I. Matheson Co.
Winnipeg, Man., Can.—Kelly Powell, Ltd., 602 McArthur Bldg.

FOSTER, L. B. CO.................385
Pittsburgh, Pa.

FOSTER ENGINEERING CO.......230
Newark, N. J.
Branch Offices:
Boston, Mass.—161 Sumner St.
Chicago, Ill.—180 N. Dearborn St.
Philadelphia, Pa.—Harrison Bldg.
Pittsburgh, Pa.—Arrott Bldg.
Agents:
Houston, Tex. — Ahrens & Ott Mfg. Co.
Louisville, Ky.—Ahrens & Ott Mfg. Co.
New Orleans, La.—Ahrens & Ott Mfg. Co.
Pittsburgh, Pa.—Standard Mfg. Co.
San Francisco, Cal.—Pacific Hardware & Steel Co.
Seattle, Wash.—Steam Supply & Rubber Co.
Canadian Agents:
Canadian-Fairbanks-Morse Co., Ltd.

FRANK, M. K.....................386
Frick Bldg., Pittsburgh, Pa.

FREEMAN, S., & SONS MFG. CO. THE 190
Racine, Wis.
Agencies:
Chicago, Ill.—The S. Freeman & Sons Mfg. Co., 530 Monadnock Bldg.
Cleveland, O. — Industrial Equipment Co., 208 American Trust Bldg.
Dallas, Tex.—J. U. Jones, 3819 Rawlin St.
Memphis, Tenn.—Southern Boiler & Tank Co.
Milwaukee, Wis.—Wm. T. Doyle, 167 Twelfth St.
Minneapolis, Minn.—Pocock & Pollard Co., 208 Iron Exchange.
Omaha, Neb. — Vincent Kenny, 414 McCague Bldg.
Pittsburgh, Pa.—R. B. Murray, 1521 Farmers Bank Bldg.
Portland, Ore. — Colby Engineering Co., 70 First St.
St. Louis, Mo.—P-K Engineers, Syndicate Trust Bldg.
San Francisco, Cal.—H. F. Lyons Co., 33 California St.

FRICK & LINDSAY CO........602-603
Pittsburgh, Pa.
Branch Offices:
Cleveland-West Park, O.
Clarksburg, W. Va.
Evans City, Pa.
Junction City, O.
Lancaster, O.
Marietta, O.
New Straitsville, O.
Winchester, Ky.

FULTON BAG & COTTON MILLS..285
330 Wytne Ave., Brooklyn, N. Y.
Atlanta, Ga. — South Blvd. and So. R. R.
Dallas, Tex.—Preston St. and Pacific Ave.
New Orleans, La.—South Peters and Gainnie Sts.
Oklahoma City, Okla.—719 Insurance Bldg.
St. Louis, Mo.—606 South Seventh St.

FULTON PIT CAR & MFG. CO. 340-341
Canal Fulton, O.
Branch Offices:
Chicago, Ill.—C. W. Campbell, 1736 Michigan Ave.
Kenova, W. Va.—Chas. Smith, Kenova Mine Car Co.
Pittsburgh, Pa.—D. A. Casey, Fulton Bldg.

FULTON TOOL CO., THE.........614
Huntington, W. Va.
Representatives:
Pittsburgh, Pa.—The Hartzell Sales Co., 7-9 West Canal St., N. S.
Huntington, W. Va. — The Hartzell Sales Co.
St. Louis, Mo.—W. R. Young, 74 Arundel Place.

G

GARTON, W. R., CO., THE.........530
11-17 S. Desplaines St., Chicago, Ill.

GEM MANUFACTURING CO.......247
N. S., Pittsburgh, Pa.
Branch Offices:
Chicago, Ill.—Stoker & Stott, 168 No. Michigan Ave.
New York, N. Y.—Walter Waghorn, Room 1204 Broadway.
Philadelphia, Pa.—W. H. Filley, 1502 Real Estate Trust Bldg.

GENERAL ELECTRIC CO.
134-206-207-282-316-438-459-479-499-521
Schenectady, N. Y.
Sales Offices:
Atlanta, Ga.—Third Natl. Bank Bldg.
Baltimore, Md.—Munsey Bldg.
Birmingham, Ala.—Brown-Marx Bldg.
Boston, Mass.—84 State St.
Butte, Mont.—Electric Bldg.
Chicago, Ill.—Monadnock Bldg.
Chattanooga, Tenn.—James Bldg.
Cincinnati, O.—Provident Bank Bldg.
Cleveland, O.—Illuminating Bldg.
Charleston, W. Va.—Charleston Natl. Bank Bldg.
Charlotte, N. C. — Commercial Natl. Bank Bldg.
Columbus, O. — Columbus Savings & Trust Bldg.
Dayton, O.—Schwind Bldg.
Denver, Colo.—First Natl. Bank Bldg.
Buffalo, N. Y.—10th Floor Elec. Bldg.
Dallas, Tex.—1701 N. Market St.
Des Moines, Ia.—Hippee Bldg.
Detroit, Mich.—G. E. Co. of Michigan, Dime Savings Bank Bldg.
Duluth, Minn.—Fidelity Bldg.
El Paso, Tex.—500 San Francisco St.
Erie, Pa.—Marine Bank Bldg.
Elmira, N. Y.—Hulett Bldg.
Ft. Wayne, Ind.—Ft. Wayne Electric Works.
Houston, Tex.—Third and Washington Sts.
Indianapolis, Ind.—Traction Terminal Bldg.
Jackson, Fla.—Heard Natl. Bank Bldg.
Joplin, Mo.—Miners Bank Bldg.
Kansas City, Mo.—Dwight Bldg.
Knoxville, Tenn.—Bank & Trust Bldg.
Los Angeles, Cal.—Corporation Bldg.
Louisville, Ky.—Starks Bldg.
Memphis, Tenn.—Randolph Bldg.
Milwaukee, Wis.—Public Service Bldg.
Minneapolis, Minn. — 410 Third Ave., North.
Nashville, Tenn.—Stahlman Bldg.
New Orleans, La. — Maison-Blanche Bldg.
New Haven, Conn. — Hartford Natl Bank Bldg.
New York, N. Y.—Hudson Terminal Bldg., 30 Church St.
Niagara Falls, N. Y.—Gluck Bldg.
Omaha, Neb.—Union Pacific Bldg.
Oklahoma City, Okla. — Insurance Bldg.
Philadelphia, Pa.—Witherspoon Bldg.
Pittsburgh, Pa.—Oliver Bldg.
Portland, Ore.—Electric Bldg.
Providence, R. I.—1012 Turks Head Bldg.
Rochester, N. Y.—Granite Bldg.
Richmond, Va.—Virginia Rwy. & Pr. Bldg.
Salt Lake City, Utah. — Newhouse Bldg.
San Francisco, Cal.—Rialto Bldg.
Scranton, Pa.—Scranton Electric Construction Co.
Schenectady, N. Y.—G. E. Works.
Seattle, Wash.—Colman Bldg.
St. Louis, Mo.—Pierce Bldg.
Springfield, Mass. — Mass. Mutual Bldg.
Spokane, Wash.—Paulsen Bldg.
Syracuse, N. Y.—Onondaga Co. Sav. Bank Bldg.
Toledo, O.—Spitzer Bldg.
Washington, D. C.—Wick Bldg.
Youngstown, O.—Evans Bldg.

GENERAL ROOFING MFG. CO.....165
Boatmen's Bank Bldg., St. Louis, Mo.
Branch Offices:
Atlanta, Ga.—H. J. Ouellette, Healy Bldg.
Boston, Mass. — R. S. Chase, Unity Bldg.
Chicago, Ill.—H. A. Jackson, Continental & Commercial National Bank Bldg.
Cincinnati, O. — R. T. Shaw, Union Central Bldg.
Cleveland, O.—W. A. Murphy, Leader-News Bldg.
Detroit, Mich. — E. C. Richardson, Dime Savings Bank Bldg.
Houston, Tex.—D. J. O'Keefe, Wood and Walnut Sts.
Indianapolis, Ind. — T. W. Winans, Merchants Bank Bldg.
Kansas City, Mo.—C. J. Stovel, R. A. Long Bldg.
Los Angeles, Cal. — Curtis C. Noel, Citizens Bank Bldg.
Minneapolis, Minn. — L. R. Walker, Plymouth Bldg.
New Orleans, La.—C. A. Bartholomew, Audubon Bldg.
New York, N. Y.—Wm. M. Taylor, Woolworth Bldg.
Philadelphia, Pa.—H. P. Stewart, New Stock Exchange Bldg.
Pittsburgh, Pa.—O. W. Sheets, Oliver Bldg.
Richmond, Va.—W. F. Barnes, Virginia Railway & Power Bldg.
St. Louis, Mo. — H. N. Saylor, Jr., Boatmens Bank Bldg.
San Francisco, Cal.—John W. Geary, Insurance Exchange Bldg.
Seattle, Wash.—Alan P. Cline, L. C. Smith Bldg.

GLAMORGAN PIPE & FOUNDRY CO. 442-443
Lynchburg, Va.
General Sales Office:
Chicago, Ill.—431 The Rookery.

GLOW ELECTRIC CO., THE.......372
Cincinnati, Ohio.

GOLDEN-ANDERSON VALVE SPECIALTY CO..................231
Fulton Bldg., Pittsburgh, Pa.

GOODIN, REID COMPANY 283
Cincinnati, Ohio.

GOODMAN MFG. CO. 460-491
4834 Halsted St., Chicago, Ill.
Branch Offices:
Birmingham, Ala.—General Machinery Co., Brown-Marx Bldg.
Charleston, W. Va.—1208 Union Bldg.
Cincinnati, O.—317-321 Sycamore St.
Denver, Colo. — Lindrooth-Shubert & Co., Boston, Bldg.
Pittsburgh, Pa.—2218 Farmers Bank Bldg.
St. Louis, Mo.—1501 Boatman's Bank Bldg.
Seattle, Wash. — L. W. Shirley, 580 First Ave., South.

GOODRICH, B. F., THE........120-238
Akron, Ohio.
Branches and Depots:
Birmingham, Ala.—424 S. 20th St.
Boston, Mass.—851 Boylston St.
Buffalo, N. Y.—1050-52 Main St.
Chicago, Ill.—1925 Michigan Ave.
Denver, Colo.—1422 Court Place.
Detroit, Mich. — Woodward Ave. and Hancock St.
Joplin, Mo.—216 W. Fourth St.
Los Angeles, Cal.—11th and Oliver Sts.
New York, N. Y.—1780 Broadway.
Norfolk, Va.—223 Water St.
Philadelphia, Pa.—519 N. Broad St.
San Francisco, Cal.—401 Mission St.
Seattle, Wash.—113 King St.
London, England. — 117 Golden Lane, E. C.
Syracuse, N. Y.—117 W. Taylor St.
Special Distributors.
Akron, O.—Union Rubber Co.
Atlanta, Ga.—Southern Rubber & Supply Co.
Beaumont, Tex.—E. L. Wilson Hardware Co.
Cincinnati, O.—Atlas Rubber & Belting Co.
Houston, Tex. — Southern Rubber & Belting Co.
Cleveland, O.—Forest City Rubber Co., 1276 Ontario St.
Columbus, O.—Columbus Mill & Mine Supply Co.
Dayton, O.—Atlas Rubber & Belting Co.
Indianapolis, Ind.—Central Rubber & Supply Co.
Jacksonville, Fla.—J. G. Christopher Co.
Louisville, Ky.—Laib Co.
Macon, Ga.—J. S. Schofield's Sons Co.
Nashville, Tenn.—Keith, Simmons & Co.
New Orleans, La. — Whitney Supply Co.
Pittsburgh, Pa.—Speck-Marshall Co.

GOULD STORAGE BATTERY CO..471
30 E. 42nd St., New York, N. Y.
(Factory, Depew, N. Y.)
Branch Offices:
Chicago, Ill.—225 E. 22nd St.
Cleveland, O.—1765 E. 18th St.
Detroit, Mich.—100 Beaubien St.
Los Angeles, Cal.—118 E. Pico St.
Philadelphia, Pa.—613 Lincoln Bldg.
San Francisco, Cal.—1448 Van Ness Ave.

List of Firms Catalogued, Branch Offices, Representatives and Agencies---Cont.

GOULDS MANUFACTURING CO...432
Seneca Falls, N. Y.

Branch Offices:
- Atlanta, Ga.—Third Natl. Bank Bldg.
- Baltimore, Md.—304 Continental Bldg.
- Boston, Mass.—58 Pearl St.
- Chicago, Ill.—12-14 S. Clinton St.
- Houston, Tex.—1001 Carter Bldg.
- New York, N. Y.—16 Murray St.
- Philadelphia, Pa.—111 No. 3rd St.
- Pittsburgh, Pa.—636 Henry W. Oliver Bldg.

Agencies:
- Cleveland, O. — Robert R. Harkins, Schofield Bldg.
- Los Angeles, Cal.—Smith-Booth-Usher Co.
- Philadelphia, Pa.—H. E. Trotman, 111 N. Third St.
- Pittsburgh, Pa. — Reineke-Wagner Pump & Supply Co., 416-18 First Av.

GRAHAM NUT CO.................360
Pittsburgh, Pa.

GREEN, L. A.......................387
First Natl. Bank Bldg., Pittsburgh, Pa.

GRIER BROS. CO., THE...........583
124 Second Ave., Pittsburgh, Pa.

GUSTAFSON MFG. CO.............338
Chattanooga, Tenn.

H

HARDSOCG, MARTIN CO. THE 612-613
Pittsburgh, Pa.

HARDSOCG MFG. CO..........612-613
Ottumwa, Ia.

Branch Office:
- Evansville, Ind.

HARRISON SAFETY BOILER WORKS 222
17th St. and Allegheny Ave.,
Philadelphia, Pa.

Representatives:
- Atlanta, Ga.—W. R. Jennison.
- Jacksonville, Fla.—W. R. Jennison.
- Boston, Mass.—Oliver Bldg.
- Chicago, Ill. — A. Sorge, Jr., & Co., Monadnock Block.
- Cincinnati, O.—H. P. Thompson, Mercantile Library Bldg.
- Cleveland, O.—Dravo-Doyle Co.
- Pittsburgh, Pa.—Dravo-Doyle Co.
- Detroit, Mich.—F. H. Mason, Moffatt Bldg.
- Houston, Tex. — H. A. Paine, 1302 Nance St.
- Indianapolis, Ind. — I. C. DeHaven, State Life Bldg.
- Kansas City, Kas.—R. V. Jones, Finance Bldg.
- Los Angeles, Cal.—Chas. C. Morre & Sons Engr. Co.
- Salt Lake City, Utah.—Chas. C. Morre & Sons Engr. Co.
- San Francisco, Cal.—Chas. C. Morre & Sons Engr. Co.
- Seattle, Wash. — Chas. C. Morre & Sons Engr. Co.
- Tucson, Ariz.—Chas. C. Morre & Sons Engr. Co.
- New Orleans, La.—Walter Castanedo, Hennen Bldg.
- New York, N. Y. — F. E. Idell, 50 Church St.
- St. Louis, Mo. — W. L. Flower Co., Cupple Block.

Canadian Representative:
- Toronto, Can.—Canadian Allis-Chalmers, Ltd., King and Simcoe Sts.

HAZARD MFG. CO...............323-518
Wilkes-Barre, Pa.

Branch Offices:
- Chicago, Ill.—552 W. Adams St.
- New York, N. Y.—533 Canal St.
- Pittsburgh, Pa.—2213 First National Bank Bldg.

Agencies:
- Aberdeen, Wash. — Grays Harbor Hardware Co.
- Baltimore, Md.—The John B. Adt Co.
- Baltimore, Md. — The New Era Elevator & Machine Co.
- Baltimore, Md. — Shepherd-Fluharty Electric Co.
- Barre, Vt.—C. W. Averill & Co.
- Bath, Me.—Frank A. Palmer.
- Birmingham, Ala. — The Electric & Auto Supply Co.
- Birmingham, Ala.—The Young & Vann Supply Co.
- Biloxi, Miss.—W. O. Clark.
- Boston, Mass. — Perrin, Seamans & Co.
- Brooklyn, N. Y.—Brooklyn Electrical Supply Co.
- Charleston, S. C.—J. J. W. Luden & Co.
- Chattanooga, Tenn. — Rogers-Bailey Hardware Co.
- Cincinnati, Ohio.—Cincinnati, Railway Supply Co.
- Columbus, Ohio.—Avery & Loeb Electric Co.
- Denver, Colo. — Stearns-Roger Mfg. Co.
- El Paso, Tex. — Krakauer, Zork & Moyes, Successors, Inc.
- El Paso, Tex.—J. E. Robertson & Co.
- Hancock, Mich.—(Special Agent) E. J. Leach.
- Hartford, Conn.—L. L. Ensworth & Son.
- Huntington, W. Va.—The Miller Supply Co.
- Indianapolis, Ind.—Indianapolis Electric Supply Co.
- Jacksonville, Fla.—Geo. E. Chase & Co.
- Jacksonville, Fla.—Ligingston, Yonge Co.
- Jacksonville, Fla.—Malsby Machinery Co.
- Kansas City, Mo. — B-R Electric & Telephone Mfg. Co.
- Los Angeles, Cal.—J. E. Robertson & Co.
- Milwaukee, Wis. — Badger-Packard Machinery Co.
- Minneapolis, Minn.—R. M. Laird Electric Co.
- Mobile, Ala.—Mobile Ship Chandlery Co.
- New London, Conn.—The Darrow & Comstock Co.
- New Orleans, La.—A. Baldwin & Co., Ltd.
- New York, N. Y.—Central Electrical Supply Co.
- New York, N. Y.—River Plate Commercial Co., Inc.
- Norfolk, Va.—Woodhouse Electric Co., Inc.
- Parkersburg, W. Va.—J. J. Crotty & Co.
- Philadelphia, Pa.—Burrows, Sloan & Co.
- Philadelphia, Pa.—Lewis & Roth Co.
- Pittsburgh, Pa. — W. T. McCullough Electric Co.
- Portland, Ore.—Marshall-Wells Hardware Co.
- Providence, R. I.—Walter Coleman & Sons.
- Richmond, Va.—W. H. Jenks.
- Rochester, N. Y.—Rochester Electrical Supply Co.
- Savannah, Ga.—The Paulsen Co.
- St. Louis, Mo.—The Continental Supply Co.
- St. Louis, Mo.—The Wesco Supply Co.
- Spokane, Wash. — Marshall-Wells Hardware Co.
- Syracuse, N. Y. — Burhans & Black, Inc.
- Syracuse, N. Y.—H. J. Gorke.
- Syracuse, N. Y.—George F. Grant Co., Inc.
- Utica, N. Y.—David F. Foster, Sons & Co.
- Utica, N. Y.—Porter Electric Co., Inc.
- Washington, D. C.—Barber & Ross.
- Washington, D. C.—Carroll Electric Co.
- Wilmington, Del.—Delaware Electric & Supply Co.
- Wilmington, Del.—Garrett, Miller & Co.

HELLER & BRIGHTLY 79
S. E. Cor. Spring Garden and Ridge Avs.,
Philadelphia, Pa.

HENDRICK MFG. CO..............124
Carbondale, Pa.

Branch Offices:
- Hazleton, Pa.—C. C. Boone.
- New York, N. Y.—B. C. Guerin, 30 Church St.

Representatives:
- Birmingham, Ala. — McCrossin Eng. Co., American Trust Bldg.
- Chicago, Ill.—R. B. Clark, Jr., Monadnock Block.
- Chicago, Ill.—Carl L. Pettersen, Pioneer Press Bldg.
- Denver, Colo.—James C. Dolan, 1617 Blake St.

HERCULES POWDER CO..567-568-569
Wilmington, Del.

Branch Offices:
- Chicago, Ill.—332 So. Michigan Ave.
- Hazleton, Pa.—2 Markle Bank Bldg.
- Pittsburg, Kan.—Commerce Bldg.
- Pittsburgh, Pa.—Fulton Bldg.
- Salt Lake City, Utah.—Kearns Bldg.
- San Francisco, Cal.—Chronicle Bldg.
- Joplin, Mo.—Independent Bldg.
- New York, N. Y.—120 Broadway.
- Denver, Colo.—317-319 Century Bldg.
- St. Louis, Mo.—1524 Pierce Bldg.

Subsidiary:
- Hercules Powder Sales Co., Bank of Commerce & Trust Bldg., Memphis, Tenn., and Knoxville, Tenn.

HESS-BRIGHT MFG. CO., THE....480
Front St. and Erie Ave.,
Philadelphia, Pa.

HIGHLAND CHEMICAL PRODUCTS CO. 440
Connellsville, Pa.

Agents:
- Chicago, Ill.—F. W. Priester, 4729 N. Troy St.
- Kansas City, Mo.—Irving Smith Supply Co.
- Scranton, Pa.—Francis H. Coffin Co., Board of Trade Bldg.

HOCH HAMES CO., INC., THE....608
803 Markle Bank Bldg., Hazleton, Pa.

Agencies:
- Apalache, Va. — Virginia Wholesale Co.
- Ashland, Ky.—Ben Williamson Hardware Co.
- Altoona, Pa. — Standard Supply & Equipment Co.
- Bluefield, W. Va. –Bluefield Hardware Co.
- Charleston, W. Va. — Charleston Hardware Co.
- Greensburg, Pa.—Probst & Son.
- Logan, W. Va.—Logan Hardware Co.
- Norton, Va.—Norton Hardware Co.
- Uniontown, Pa.—W. D. Ghrist.

HOCKENSMITH WHEEL & MINE CAR CO...............342-343
Penn Station, Pa.

Representatives:
- Chicago, Ill.—Orenstein-Arthur Koppel Co., Peoples Gas Bldg.
- Huntington, W. Va.—Huntington Supply & Equipment Co., Robson-Prichard Bldg.
- Johnstown, Pa.—Johnson & Moses, Johnstown Trust Bldg.
- Knoxville, Tenn.—Webster & Co., Holston Bank Bldg.
- St. Louis, Mo. — Orenstein-Arthur Koppel Co., Railway Exchange Bldg.

HOFFMAN BROS. 66
Punxsutawney, Pa.

HOLMES ROBERT, & BROS., INC. 306-307
Danville, Ill.

Agency:
- Hendrie & Bolthoff Mfg. & Supply Co., Denver, Colo.

HOMESTEAD VALVE MFG. CO....232
P. O. Box 1754, Pittsburgh, Pa.

Agents:
- Mobile, Ala.—American Supply Co.
- Atlanta, Ga.—Atlanta Manufacturing & Supply Co.
- Baltimore, Md.—Aumen Machinery Co.
- Detroit, Mich.—Kenneth Anderson Co.
- Muskogee, Okla.—Atlas Supply Co.
- Kansas City, Mo. — English Tool & Supply Co.
- Portland, Me.—W. L. Blake & Co.
- New York, N. Y.—Frank Boyle, 428 Park Row Bldg.
- Little Rock, Ark.—Geo. A. Boosey, 304 E. Markham St.
- Philadelphia, Pa.—Brogan & Co., 810 Race St.
- Dallas, Tex.—Briggs-Weaver Machinery Co.
- Providence, R. I.—E. M. Dart Manufacturing Co., 136 Clifford St.
- Tampa, Fla.—Cameron & Barkley Co.
- Jacksonville, Fla.—J. G. Christopher Co.
- St. Louis, Mo.—Donovan Iron & Supply Co.
- Erie, Pa.—Erie Manufacturing & Supply Co.
- Salt Lake City, Utah.—Galligher Machinery Co.
- Denver, Colo. — Hendrie & Bolthoff Mfg. & Supply Co.
- Houston, Tex.—F. W. Heitman & Co.
- Indianapolis, Ind.—Indianapolis Belting & Supply Co.
- El Paso, Tex. — Krakauer, Moyes & Zork Co.
- Cincinnati, O.—E. A. Kinsey Co.
- Everett, Wash.—Lloyd Manufacturing Agency.
- Louisville, Ky.—E. D. Morton & Co.

(Continued on Next Page)

List of Firms Catalogued, Branch Offices, Representatives and Agencies----Cont.

Fort Smith, Ark.—Meister Brothers-Bracht Co.
Oklahoma City, Okla.—Mideke Supply Co.
San Francisco, Cal.—Marshall-Newell Supply Co.
Memphis, Tenn.—N. O. Nelson Co.
Chicago, Ill. — McMaster-Carr Supply Co., 174 No. Market St.
Richmond, Va.—James McGraw & Co., 1440 East Main St.
Oil City, Pa.—Oil Well Supply Co.
Beaver Falls, Pa.—H. S. Palmer Supply Co.
Cleveland, O.—W. M. Pattison Supply Co.
Warren, Pa.—Pickett Hardware Co.
Minneapolis, Minn.—Power Equipment Co.
Buffalo, N. Y.—J. H. Ruckel & Son.
McAlester, Okla. — Russell Hardware Co.
Seattle, Wash. — Steam Specialty & Rubber Co.
Scranton, Pa.—Charles B. Scott Co.
Los Angeles, Cal.—Smith-Booth-Usher Co., 238 Central Ave.
Savannah, Ga.—Savannah Supply Co., West Bay St.
San Antonio, Tex.—San Antonio Machine & Supply Co.
Fort Worth, Tex.—Texas Manufacture Co.
Portland, Ore.—The Tomlinson Co.
Knoxville, Tenn. — Tennessee Mill & Mine Co.
Omaha, Neb. — United States Supply Co.
Tacoma, Wash.—Walsh & Gardner.
New Orleans, La.—Woodward, Wight & Co.
Butte, Mont.—Western Mining Supply Co.
Birmingham, Ala. — Young & Vann Supply Co.
Troy, N. Y.—Fred K. Blanchard, 422 River St.
Boston, Mass.—Braman, Dow & Co.
Springfield, Mass.—Wycoff & Lloyd Supply Co.
Toledo, O. — Standard Manufacturing Co.

HOUSTON, STANWOOD & GAMBLE CO. 191
Cincinnati, Ohio.

HOWE SCALE CO., THE...........131
(Factory, Rutland, Vermont)
Branch Offices:
Atlanta, Ga.
Boston, Mass.
Chicago, Ill.
Cincinnati, O.
Cleveland, O.
Kansas City, Mo.
Los Angeles, Cal.
Minneapolis, Minn.
New York, N. Y.
Philadelphia, Pa.
Pittsburgh, Pa.
Portland, Ore.
St. Louis, Mo.
San Francisco, Cal.

HOWELLS MINING DRILL CO.....500
Plymouth, Pa.

HUMPHRYS', R. A., SONS.........610
1021-1023 Callowhill St.,
Philadelphia, Pa.

HYATT ROLLER BEARING CO....359
Newark, N. J.

HYDE, W. H........................73
P. O. Box 791, Pittsburgh, Pa.
Branch Office:
Washington, D. C.—1305 Delafield St., N. W.

I

IMPERIAL BRASS MFG. CO.......368
1200 West Harrison St., Chicago, Ill.
Branch Offices:
Detroit, Mich.—Jas. T. Greenlee, Stevens Bldg.
New York, N. Y.—C. L. Newkom, 51 E. 42nd St.
San Francisco, Cal.—A. J. Buckley, 530 Monadnock Bldg.

INDESTRUCTO ELECTRIC MINE LAMP CO., INC......................577
1215-17 S. Fifteenth St.,
Philadelphia, Pa.

INDIANA FOUNDRY CO., LTD....486
Indiana, Pa.

INDIANAPOLIS SWITCH & FROG CO., THE 393
Springfield, O.
Branch Offices:
Chicago, Ill. — 1528-29 McCormick Bldg.
New York, N. Y.—50 Church St.

INGERSOLL-RAND CO. 221-224-496
11 Broadway, New York, N. Y.
Branch Offices:
Birmingham, Ala.—H. M. Perry, Mgr., American Trust Bldg.
Boston, Mass.—R. K. Swift, Mgr., 32 Oliver St.
Buffalo, N. Y.—114 Claremont Ave.
Butte, Mont.—R. W. Rusterholz, Mgr., 109 E. Broadway.
Chicago, Ill.—M. P. Frutchey, Mgr., Peoples Gas Bldg.
Cleveland, O.—W. A. Armstrong, Mgr., Williamson Bldg.
Denver, Colo. — Stearns-Roger Mfg. Co., 1718 California St.
Duluth, Minn.—S. H. Hill, Mgr., Providence Bldg.
El Paso, Tex.—J. D. Foster, Mgr., 121 San Francisco St.
Houghton, Mich. — Thos. F. Lynch, Mgr., Citizens Natl. Bank Bldg.
Joplin, Mo.—111 West Third St.
Knoxville, Tenn. — L. F. Thompson, Mgr., Holston Natl. Bank Bldg.
Los Angeles, Cal. — W. Blackburn, Mgr., 1035 Union Oil Bldg.
Mexico City, Mex.—Cadena No. 2.
New Orleans, La. — Hibernia Bank Bldg.
Philadelphia, Pa.—Phil. Weiss, Mgr., Commercial Trust Bldg.
Pittsburgh, Pa.—W. F. Gilles, Mgr., Farmers Bank Bldg.
Scranton, Pa. — Dime Savings Bank Bldg.
St. Louis, Mo.—D. M. Armstead, Mgr., 300 N. Broadway.
Salt Lake City, Utah.—Galigher Machinery Co., 224 S. W. Temple St.
San Francisco, Cal.—H. L. Terwilliger, Mgr., 139 Townsend St.
Seattle, Wash.—R. W. Douglass, Mgr., Colman Bldg.
Washington, D. C.—Fred S. Hardesty, Home Life Bldg.

IRON CITY ELECTRIC CO.....531-546
711 Grant St., Pittsburgh, Pa.
Representative:
Cumberland, Md. — C. W. White, 86 Decatur St.

IRONTON ENGINE CO.............466
Ironton, Ohio.

IRWIN FOUNDRY & MINE CAR COMPANY 348
Irwin, Pa.

J

JAMISON RAIL BOND & ELECTRICAL SUPPLY CO., THE......527
7077-7078 Jenkins Arcade,
Pittsburgh, Pa.
District Offices:
Boston, Mass.—19 Milk St.
Chicago, Ill.—327 So. LaSalle St.
Cleveland, O.—1617 Williamson Bldg.
Denver, Colo.—1619 Glenarm St.
Los Angeles, Cal.—403 Trust & Savings Bldg.
New York, N. Y.—Atkinson & Utech Co., 111 Broadway.
New Orleans, La.—John S. Black Co., 908 Hennen Bldg.
Salt Lake City, Utah.—R. J. Glendinning & Co., 1102 Newhouse Bldg.

THE JEFFREY MFG. CO.......100-101-102-138-272-273-274-462-463-492-493
962 N. Fourth St., Columbus, Ohio.
Branch Offices:
Birmingham, Ala. — C. M. Blanchard, Mgr., Brown-Marx Bldg.
Chicago, Ill.—S. S. Shive, Mgr.; Geo. B. Ellstrom, C. C. Ford, 1807 McCormick Bldg.
Denver, Colo.—Frank R. Field, Mgr.; E. C. Horne, C. M. Goddard, First National Bank Bldg.
Dallas, Tex.—J. U. Jones, Mgr., Commonwealth Bank Bldg.
Middlesboro, Ky.—J. L. Moore.
Milwaukee, Wis.—A. Q. Dufour, Mgr., M. & M. Bldg.
New York, N. Y.—G. H. Mueller, Mgr.; F. C. Ayers, W. C. Miller, J. B. Noros, 50 Dey St.
Philadelphia, Pa.—J. G. Ogden, Mgr., Real Estate Trust Co.
Pittsburgh, Pa. — W. W. Woodruff, Mgr.; C. H. Fisher, J. H. McKinley, Farmers Bank Bldg.
St. Louis, Mo.—W. V. Cullen, Mgr., Room A-21 Railway Exchange Bldg.
Seattle, Wash.—P. E. Wright, Mgr., L. C. Smith Bldg.
Canadian Office:
Montreal, Que., Can.—M. W. Sherwood, Mgr., Power Bldg.
Protected Agents:
Atlanta, Ga.—Cotton States Belting & Supply Co.
Baltimore, Md. — Carey Machinery & Supply Co.
Boston, Mass.—H. C. Freeman & Co., 141 Milk St.
Buffalo, N. Y.—Hendee-Connor Co.
Cedar Rapids, Ia.—Cedar Rapids Pump Co.
Charleston, S. C.—Bailey-Lebbey Co., Meeting St.
Charleston, W. Va.—Charleston Electrical Supply Co.
Cincinnati, O.—Wirthlin-Mann Co.
Cleveland, O. — Strong, Carlisle & Hammond Co.
Fort Smith, Ark.—Meister Brothers-Bracht Co.
Fort Worth, Tex.—Texas Mfg. Co.
Houston, Tex.—Peden Iron & Steel Co.
Indianapolis, Ind.—Indianapolis Belting & Supply Co.
Jacksonville, Fla.—Georgia Supply Co.
Louisville, Ky.—W. H. Neill Co.
Memphis, Tenn. — Reichman-Crosby Co.
Minneapolis, Minn.—Frank J. Rose Co.
Montgomery, Ala.—Alabama Machinery & Supply Co.
Nashville, Tenn.—Keith-Simmons Co.
New Bern, N. C.—Hyman Supply Co.
New Orleans, La.—A. M. Lockett & Co.
Norfolk, Va.—Henry Walke Co.
Richmond, Va.—Smith-Courtney Co.
St. Louis, Mo.—Crickwell Mine & Mill Supply Co.
Salt Lake City, Utah.—R. J. Glendenning & Co.
San Francisco, Cal.—General Machinery & Supply Co.
Savannah, Ga.—Georgia Supply Co.
Syracuse, N. Y.—Syracuse Supply Co.
Troy, N. Y.—Tolhurst Machine Works.
Wilmington, N. C. — Hyman Supply Co.
Agents Not Protected:
Cleveland, O.—C. B. Reed, 1617 Williamson Bldg.
Fort Wayne, Ind.—National Mill Supply Co.
Macon, Ga.—Schofield Sons Co.
Little Rock, Ark.—Central Supply Co.
Mobile, Ala. — McGowan-Lyons Hdwe Co.
Mulberry, La.—Mine & Mill Supply Co.
New Orleans, La.—Fairbanks Co.
Portland, Ore.—Portland Machinery & Supply Co.
St. Mary's, O.—Jasperson Supply Co.
Toledo, O.—Standard Mfg. Co.
Washington, N. C.—McKeel-Richardson Hdwe. Co.

JENKINS BROS. 233
80 White St., New York, N. Y.
Branch Offices:
Boston, Mass.—524 Atlantic Ave.
Chicago, Ill.—300 West Lake St.
Philadelphia, Pa.—133 No. Seventh St.

JOHANNESSEN, J., & SON..........67
Punxsutawney, Pa.

JOHNS, H. W.—MANVILLE CO....166
Madison Ave. and Forty-first St.,
New York, N. Y.
Branches:
Chicago, Ill. — T. T. Lyman, Mgr., Michigan Ave. and Eighteenth St.
Cleveland, O. — Harry Gillett, Mgr., 813-15 Superior Ave., N. W.
New York, N. Y.—J. J. Greene, Mgr., Madison Ave. and Forty-first St.
New York, N. Y.—1930 Broadway.
Philadelphia, Pa. — E. Searing, Mgr., 210 N. Broad St.
Pittsburgh, Pa.—A. G. Cutting, Mgr., 100-102 Wood St.
St. Louis, Mo.—W. G. Klauss, Mgr., 501-505 N. Third St.
Seattle, Wash.—D. W. Boylan, Mgr., Third Ave. and Stewart St.

H. W. Johns-Manville Co.
of Massachusetts
Boston, Mass.—H. R. Trainer, Mgr., 55-61 High St.
Boston, Mass.—74 Brookline Ave.
San Francisco, Cal.—W. S. Greenfield, Mgr., Second and Howard Sts.

List of Firms Catalogued, Branch Offices, Representatives and Agencies--Cont.

H. W. Johns-Manville Co.
of California
San Francisco, Cal.—1247-49 Van Ness Ave.

The Canadian
H. W. Johns-Manville Co., Limited
Toronto, Ont.—W. M. Hiller, Mgr., 19 Front St., East.

Offices:
H. W. Johns-Manville Co.
Akron, O.—717 Second National Bank Bldg.
Albany, N. Y.—260 Central Ave.
Atlanta, Ga.—31-A So. Broad St.
Baltimore, Md.—207-213 E. Saratoga St.
Birmingham, Ala. — 315 Brown-Marx Bldg.
Buffalo, N. Y.—206-208 Main St.
Cincinnati, O.—654-656 Main St.
Columbus, O.—45 West Long St.
Dayton, O.—604 Schwind Bldg.
Denver, Colo. — 534 Denver Gas & Elec. Bldg.
Detroit, Mich.—72 Jefferson Ave.
Detroit, Mich.—874 Woodward Ave.
Duluth, Minn.—327 West First St.
Houghton, Mich.—96 Shelden St.
Indianapolis, Ind. — 408-410 Capitol Ave.
Kansas City, Mo.—1514 Grand Ave.
Louisville, Ky. — 659-661 So. Fourth Ave.
Memphis, Tenn.—274 Monroe St.
Milwaukee, Wis.—201-231 Clybourn St.
Minneapolis, Minn.—18 So. Eighth St.
Nashville, Tenn.—922 Stahlman Bldg.
Newark, N. J.—239 Halsey St.
New Orleans, La.—Cor. Magazine and Gravier Sts.
Omaha, Neb.—1003 Farnam St.
Portland, Ore.—69 Broadway.
Rochester, N. Y. — 521 Chamber of Commerce.
St. Paul, Minn.—420 Merchants Natl. Bank Bldg.
Syracuse, N. Y.—344 Gurney Bldg.
Toledo, O.—237 Erie St.
Tulsa, Okla.—308 Unity Bldg.
Washington, D. C.—Builders & Mfrs. Exchange Bldg.
Wilkes-Barre, Pa. — Coal Exchange Bldg.
Youngstown, O.—502 Stambaugh Bldg.

H. W. Johns-Manville Co. of Texas
Dallas, Tex.—2008-10 Commerce St.
El Paso, Tex.—726 Mills Bldg.
Galveston, Tex.—2209-11 Strand St.
Houston, Tex.—304 Texas Co. Bldg.

H. W. Johns-Manville Co. of Utah
Salt Lake City, Utah.—408-9 Dooley Block.

Canadian Offices:
The Canadian
H. W. Johns-Manville Co., Limited
Toronto, Ont.—W. M. Hiller, Mgr., 19 Front St., East.
Montreal, Que.—450-452 St. James St.
Vancouver, B. C.—511 Winch Bldg.
Winnipeg, Man.—385 Portage Ave.

H. W. Johns-Manville Co.
of California
Los Angeles, Cal.—1232 So. Grand Av.
Sacramento, Cal.—1015 Tenth St.
San Diego, Cal.—726 Broadway.
Havana, Cuba.—Obispo 49.

JOHNS-PRATT CO., THE............239
Hartford, Conn.

Agents:
Baltimore, Md. — Carey Machinery & Supply Co.
Boston, Mass.—Eagle Oil & Supply Co.
Buffalo, N. Y.—Buffalo Mill Supply Co.
Charlotte, N. C. — The Textile Mill Supply Co.
Chicago, Ill. — Seehausen, Wehrs & Co.
Cincinnati, O.—The Queen City Supply Co.
Cleveland, O. — The Mau-Sherwood Supply Co.
Denver, Colo.—The Mountain States Rubber Co.
Detroit, Mich. — Kenneth Anderson Co.
Duluth, Minn.—Marshall-Wells Hardware Co.
El Paso, Tex.—The Mountain States Rubber Co.
Erie, Pa.—H. P. Weller Supply Co.
Evansville, Ind.—Laib Co.
Fort Worth, Tex.—Texas Mfg. Co.
Hartford, Conn.—Hartford Mill Supply Co.
Holyoke, Mass. — Holyoke Valve & Hydrant Co.
Houston, Tex.—J. B. Russ.
Little Rock, Ark. — Central Supply Co.
Los Angeles, Cal.—Warren & Bailey Mfg. Co.
Louisville, Ky.—Laib Co.
Macon, Ga.—Mallary Mill Supply Co.
Memphis, Tenn.—Reed & Duecker.
New Orleans, La.—Ahrens & Ott Mfg. Co.
New York, N. Y.—John Simmons Co.
Norfolk, Va.—E. V. White & Co.
Omaha, Neb.—H. M. Orschel & Co.
Philadelphia, Pa. — Collieries Supply & Equipment Co.
Pittsburgh, Pa. — Steam Equipment Mfg. Co.
Portland, Ore.—Gutta Percha & Rubber Mfg. Co.
Rochester, N. Y.—Haverstick & Co.
Salt Lake City, Utah.—The Mountain States Rubber Co.
San Francisco, Cal.—Gutta Percha & Rubber Mfg. Co.
Seattle, Wash.—Gutta Percha & Rubber Mfg. Co.
St. Louis, Mo.—Donovan Iron & Supply Co.
St. Paul, Minn. — Robinson-Cary & Sands Co.
Toledo, O.—The Hardy & Dischinger Co.
Troy, N. Y.—Troy Belting & Supply Co.
Utica, N. Y.—Charles Millar & Son Co.

JOHNSTON-MOREHOUSE-DICKEY CO., THE..............286
Pittsburgh, Pa.

JUSTRITE MFG. CO..............584
2061-2081 Southport Ave., Chicago, Ill.

K

KANAWHA MFG. CO..........104-349
Charleston, W. Va.

KEASBEY & MATTISON CO.......167
Ambler, Pa.
Branch Offices and Agents:
Atlanta, Ga. — Clayton S. Berry, 46 Fairlie St.
Baltimore, Md. — Chesapeake Rfg. & Pipe Covg. Co., 117 Cheapside.
Baltimore, Md.—Wallace & Gale, 115 S. Gay St.
Boston, Mass.—186 Purchase St.
Boston, Mass.—Nightingale & Childs Co., 205 Congress St.
Buffalo, N. Y.—17 Terrace.
Chattanooga, Tenn. — Porter Warner, Room 320 Hamilton Natl. Bank.
Chicago, Ill.—222-24 Lake St.
Cincinnati, O.—528 Main St.
Cleveland, O.—513-14 American Trust Bldg.
Denver, Colo. — W. S. Gore, 204 Eudora St.
Detroit, Mich.—S. P. Conkling, 68 Jefferson Ave.
Houston, Tex.—521 Beatty Bldg.
Indianapolis, Ind. — Lemcke Bldg. Thru Cincinnati.
Jackson, Miss.—Jackson Lbr. Co.
Kansas City, Mo.—F. T. Crowe Co., 1103 First St.
Kansas City, Mo.—R. V. Aycock & Co., 1737 Walnut St.
Minneapolis, Minn.—427-29 Washington Ave., N.
Nashville, Tenn.—Specialties Co., 50 Arcade.
New Orleans, La.—J. T. Mann & Co., 909 Union St.
New York, N. Y.—217 Broadway.
Philadelphia, Pa. — Mag. Covg. Co., 1927-29 Market St.
Pittsburgh, Pa.—Monongahela House, 339 Water St.
Portland, Ore. — Gillen-Chambers, 66 N. Front St.
St. Louis, Mo.—105 Main St.
Salt Lake City, Utah.—T. A. Williams, 211-15 Scott Bldg.
San Francisco, Cal.—J. A. Drummond, 245 Mission St.
Steelton, Pa.—Geo. L. Merryman.
Syracuse, N. Y.—319 Seitz Bldg.
Washington, D. C.—1111 Fourteenth St., N. W.
Wilkes-Barre, Pa. — W. E. Steelman Co., 85 N. Main St.

KELLER, E., CO., THE............192
Williamsport, Pa.
Agencies:
Boston, Mass. — Widger-Miller, 141 Milk St.
Chicago, Ill.—E. Keller Co., 1409 Harris Trust Bldg.
New Orleans, La.—A. Baldwin, Ltd.
New York, N. Y.—E. Keller Co., Room 1878, 50 Church St.
Philadelphia, Pa.—E. Keller Co., 1518 Real Estate Trust Bldg.
Pittsburgh, Pa. — E. Keller Co., 905 Commonwealth Bldg.
Portland, Ore. — Power Equipment Co., 816-17 Lewis Bldg.
Richmond, Va.—J. L. Lindsay, Inc., 1321 Main St.
Richmond, Va. — Hawkins-Hamilton Co., American National Bank Bldg.
Rochester, N. Y. — Strong-Hery Co., 301-307 State St.
Seattle, Wash.—Power Equipment Co., Central Bldg.

KENOVA MINE CAR CO.......344-345
Huntington, W. Va.

KERR TURBINE COMPANY.......211
Wellsville, N. Y.
Branch Offices:
Atlanta, Ga.
Birmingham, Ala.
Boston, Mass.
Charlotte, N. C.
Chicago, Ill.
Cincinnati, O.
Cleveland, O.
Detroit, Mich.
Denver, Colo.
Houston, Tex.
Indianapolis, Ind.
Kansas City, Mo.
Memphis, Tenn.
Minneapolis, Minn.
New Orleans, La.
New York, N. Y.
Omaha, Neb.
Philadelphia, Pa.
Pittsburgh, Pa.
Portland, Ore.
St. Louis, Mo.
Salt Lake City, Utah.
San Francisco, Cal.
Seattle, Wash.
Sherman, Tex.
Washington, D. C.
Winnipeg, Mo.
Canadian Offices:
Montreal, Can.; Toronto, Ont., Can.; Vancouver, B. C., Can.

KESTER ELECTRIC CO., THE.....547
Terre Haute, Ind.

KEYSTONE LUBRICATING CO....253
Philadelphia, Pa.
Branch Offices:
Boston, Mass.—141 Milk St.
Chicago, Ill.—3633-39 So. Racine Ave.
Denver, Colo.—First Natl. Bank Bldg.
New York, N. Y.—1777 Broadway.
New Orleans, La.—609 Chartres St.
Philadelphia, Pa. — Twenty-first and Clearfield Sts.
Pittsburgh, Pa.—Jenkins Arcade Bldg.
San Francisco, Cal.—268 Market St.
Savannah, Ga.—141 Drayton St.

KILBY FROG & SWITCH CO......394
Birmingham, Ala.

KING POWDER CO., THE.........570
Cincinnati, O.
Agency:
Charleston, W. Va.—Lewis, Hubbard & Co.

KINGSFORD FOUNDRY & MACHINE WORKS..............433
Oswego, N. Y.

KOEHLER MFG. COMPANY.......580
Marlboro, Mass.
Representatives:
Pittsburgh, Pa.—Mine Safety Appliance Co.
Scranton, Pa.—G. A. Luckenbach, 1643 Jefferson Ave.

L

LAWRENCEVILLE BRONZE CO...605
31st St. and Penn Ave., Pittsburgh, Pa.
Representatives:
Chicago, Ill. — Geo. W. Talmage, 60 East Lake St.
Philadelphia, Pa.—Ed. G. Loose, 2315 North Eighteenth St.
New York, N. Y.—Ellsworth Haring, 114-118 Liberty St.

LAZARUS, M. E., CO., THE........388
978 Rockefeller Bldg., Cleveland, O.

LEHIGH PORTLAND CEMENT C................................169
Allentown, Pa.

LEETONIA TOOL COMPANY......615
Leetonia, Ohio.

List of Firms Catalogued, Branch Offices, Representatives and Agencies---Cont.

LESCHEN, A., & SONS ROPE CO...324
914-926 N. First St., St. Louis, Mo.
Branch Offices:
New York Store—87-90 West St.
Chicago Store—171-173 West Lake St.
Denver Store—1645-1647 Wazee St.
Salt Lake Store—921 Kearns Bldg.
San Francisco Store — Monadnock Bldg.

LE VALLEY-VITAE CARBON BRUSH CO. 541
521 West 23rd St., New York, N. Y.
Sales Offices:
Birmingham, Ala. — McClary-Jemison Machinery Co., 3 S. Twentieth St.
Cleveland, O. — Edward S. Ford, 11 Wade Bldg.
New Orleans, La.—John S. Black, 908 Hennen Bldg.
Pittsburgh, Pa.—William D. Stevenson, Westinghouse Bldg.
North Fork, W. Va.—C. C. McGuire.
Knoxville, Tenn.—H. H. Ashmore.

LIDGERWOOD MFG. CO.............309
96 Liberty St., New York, N. Y.
Branch Offices:
Chicago, Ill.—Fisher Bldg.
Philadelphia, Pa.—Widener Bldg.
Pittsburgh, Pa.—Union Bank Bldg.
Seattle, Wash.—63-5 Columbia St.

LIFE SAVINGS DEVICES CO......589
180 N. Market St., Chicago, Ill.
Detroit, Mich.—Life Saving Devices Co., 540 David Whitney Bldg.
New York, N. Y.—Life Saving Devices Co., 1107 Times Bldg.

LIGHT RAILWAY EQUIPMENT COMPANY 395
Chester, Pa.
Branch Offices:
Philadelphia, Pa. — 828 Commercial Trust Bldg.
Pittsburgh, Pa.—Federal Engineering Co., 1116 House Bldg.

LINK-BELT COMPANY 103-279
39th St. and Stewart Ave., Chicago, Ill.
Ewart Works: West Michigan St. and Holmes Ave., Indianapolis, Ind.
Belmont Works: Belmont Ave. and "Pennsylvania" and "Big Four" tracks, Indianapolis, Ind.
Philadelphia, Pa.—P. & R. Ry. and Hunting Park Ave.
Branch Offices:
Boston, Mass.—49 Federal St.
Buffalo, N. Y.—698 Ellicott Square.
Cleveland, O.—1304 Rockefeller Bldg.
Detroit, Mich.—732 Dime Bank Bldg.
Los Angeles, Cal.—161 N. Los Angeles St.
New York, N. Y.—299 Broadway.
Pittsburgh, Pa.—1501-2 Park Bldg.
Portland, Ore.—Fourteenth and Lovejoy Sts.
St. Louis, Mo. — Central Natl. Bank Bldg.
Seattle, Wash.—580 First Ave., S.
Wilkes-Barre, Pa.—Second Natl Bank Bldg.
Sales Offices:
Birmingham, Ala.—General Machinery Co., 546 Brown-Marx Bldg.
Denver, Colo.—Lindrooth, Shubart & Co.
Knoxville, Tenn.—D. T. Blakey, 704 Empire Bldg.
Louisville, Ky.—Frederick Wehle, 1121 Starks Bldg.
Minneapolis, Minn.—418 S. Third St.
Mobile, Ala.—Turner Supply Co., St. Louis and Commerce Sts.
New Orleans, La. — C. O. Hinz, 612 Hibernia Bank Bldg.
New Orleans, La. — Whitney Supply Co., 418 S. Peters St.
San Francisco, Cal.—The Eby Mchy. Co., 35 Main St.
Canadian Representatives:
Brantford, Ont., Can.—Waterous Engine Works Co., Ltd.
Toronto, Que., Can.—Canadian Link-Belt Co., Ltd.

LOBDELL CAR WHEEL CO....346-347
Wilmington, Del.
Branch Office:
New York, N. Y.—G. S. Thompson, Mgr., 6 Church St.
Representatives:
Bluefield, W. Va.—F. M. Archer.
Norton, Va.—Norton Electric Supply & Equipment Co.

LITCHFIELD FOUNDRY & MACHINE CO. 310
Litchfield, Ill.

LYNCHBURG FOUNDRY CO...442-443
Lynchburg, Va.
General Sales Office:
Chicago, Ill.—Peoples Gas Bldg.
Branch Sales Offices:
Dallas, Tex.
Los Angeles, Cal.
Portland Ore.
Tacoma, Wash.

Mc

McCLAVE-BROOKS CO.............198
Scranton, Pa.
Branch Offices:
New York, N. Y.—S. C. Smith, Room 351, 50 Church St.
Boston, Mass.—S. C. Smith, Rooms 409-410, 261 Franklin St.
Chicago, Ill.—F. G. Smith, 708 Fisher Bldg.
Philadelphia, Pa.—Geo. Blair, Jr., 34 N. Woodlawn Ave., Aldan, Del. Co. (suburb of Philadelphia).
Buffalo, N. Y. — M. E. Henshaw, 55 Laurel St.
Southern Representative:
New Orleans, La.—Chas. Gruneberg, 425 Gravier St.

McCOY-BRANDT MACHINERY CO. 373
Pittsburgh, Pa.

McCULLOUGH, W. T., ELECTRIC COMPANY 532
2315 Penn Ave., Pittsburgh, Pa.

McKAY, JAMES, COMPANY.........361
Pittsburgh, Pa.

M

MACBETH-EVANS GLASS CO......582
Pittsburgh, Pa.
Branch Offices:
Boston, Mass.—60 High St.
Chicago, Ill.—172 West Lake St.
Cincinnati, O.—Pickering Bldg.
Cleveland, O.—1900 Euclid Ave.
New York, N. Y.—143 Madison Ave.
Philadelphia, Pa.—1613 Chestnut St.
San Francisco, Cal.—Rialto Bldg.
St. Louis, Mo. — Laclede Gas Light Bldg.
Canadian Office:
Toronto, Ont., Can. — Macbeth-Evans Glass Co., Ltd., 160 Bay St.

MACOMBER & WHYTE ROPE COMPANY 325
Kenosha, Wis.
Branch Offices:
Chicago, Ill.
Pittsburgh, Pa.
Portland, Ore.
Agencies:
Atlanta, Ga.—W. E. Austin Machinery Co.
Atlanta, Ga.—Fulton Supply Co.
Appleton, Wis. — Schlafer Hardware Co.
Bay City, Mich.—Alert Pipe & Supply Co.
Butler, Pa.—Spand & Co.
Bloomington, Ind.—Seward & Co.
Baltimore, Md.—John C. Louis.
Chicago, Ill. — Macomber & Whyte Rope Company.
Cincinnati, O.—J. R. Wood Supply Co.
Chattanooga, Tenn.—Magill Hardware Co.
Cleveland, O.—W. M. Pattison Supply Co.
Detroit, Mich.—United Forge & Machine Co.
Denver, Colo.—Advance Machinery & Supply Co.
Dayton, O.—M. D. Larkin Supply Co.
Duluth, Minn.—National Iron Co.
Erie, Pa.—H. P. Weller Supply Co.
Eau Claire, Wis.—H. Hobbs Supply Co.
Findlay, O.—Ohio Pipe Co.
Ft. Smith, Ark.—Meister Brothers Bracht Co.
Habana, Cuba.—Quinones & Martinez, S. en C.
Hazard, Ky.—Sterling Hardware Co.
Helena, Ark.—Helena Hardware Co.
Huntington, W. Va.—Huntington Supply & Equipment Co.
Indianapolis, Ind.—Indianapolis Belting & Supply Co.
Jacksonville, Fla. — L. A. Hardee & Co.
Joplin, Mo.—McNeal Machinery Co.
Knoxville, Tenn.—W. J. Savage Co.
Kansas City, Mo.—Kansas City Steel Products Co.
Kittanning, Pa.—Louden & Smith.
Leavenworth, Kans.—Great Western Mfg. Co.
Louisville, Ky.—Todd Donigan Iron Co.
Little Rock, Ark.—C. E. Rosenbaum Machinery Co.
Lansing, Mich.—A. T. Vandervoort.
Minneapolis, Minn.—Hudson & Thurber Co.
Macon, Ga.—Taylor Iron Works & Supply Co.
Marietta, O. — Producers Supply & Tool Co.
Milwaukee, Wis.—H. F. Evans.
Nashville, Tenn. — Atlas Machinery Co.
New Orleans, La. — Whitney Supply Co.
Norfolk, Va.—Herbert H. Cory, Inc.
Omaha, Neb.—Hudson & Thurber Co.
Pittsburgh, Pa.—Macomber & Whyte Rope Co.
Pittsburgh, Pa.—Pittsburgh Gage & Supply Co.
Portland, Ore. — Macomber & Whyte Rope Co.
Richmond, Va.—James McGraw.
Saginaw, Mich. — Saginaw Hardware Co.
Scranton, Pa.—Chas. B. Scott Co.
St. Joseph, Mo. — Jamieson Machine Co.
St. Cloud, Minn.—St. Cloud Iron Wks.
St. Louis, Mo.—H. P. Webb Co.
Tulsa, Okla.—Western Rope & Cordage Co.
Van Buren, Ark.—Engineering Wks.
Valdosta, Ga. — Strickland-Tillman Hardware Co.
Waco, Tex.—Herrick Hardware Co.
Wheeling, W. Va.—C. H. Berry Supply Co.

MAIN BELTING CO. 121
Twelfth and Carpenter Sts., Philadelphia, Pa.
Branch Offices:
Chicago, Ill.—J. W. Cullen, Mgr., 13-17 N. Jefferson St.
New York, N. Y.—W. C. Schreiner, Mgr., 2 Rector St.
Pittsburgh, Pa. — W. C. Schreiner, Mgr., 33 Terminal Way.
San Francisco, Cal.—Wm. M. Taylor, Mgr., 156 Second St.
Canadian Offices:
Montreal, Que., Can. — Main Belting Co. of Canada, Ltd., 10½ St. Peter St., D. E. Parker, Mgr.
Toronto, Ont.,—Foy Bldg., 32 Front St., West.

MALCOLMSON BRIQUET ENGINEERING CO. 142
Old Colony Bldg., Chicago, Ill.
Branch Office:
St. Louis, Mo.—818 Security Bldg.

MANCHA STORAGE BATTERY LOCOMOTIVE CO. 467
St. Louis, Mo.

MANIERRE ENGINEERING & MACHINERY CO. 136
Milwaukee, Wis.
Branch Offices:
Chicago, Ill.
Denver, Colo.—Lindrooth, Shubart & Co.
Philadelphia, Pa.
Salt Lake City, Utah.—Utah Engineering & Machinery Co.

MANNESMANN LIGHT CO. OF AMERICA, INC. 578
Tompkinsville, N. Y.
Branch Office:
Denver, Colo. — W. F. Murphy, 415 Seventeenth St.

MASHEK ENGINEERING CO.......143
90 West St., New York, N. Y.

MASSILLON IRON & STEEL CO. 442-443
Massillon, O.
General Sales Office:
Chicago, Ill.—The Rookery.

MICHIGAN PIPE CO., THE........444
Bay City, Mich.
Representatives:
Chicago, Ill.—F. C. Justice, 203 South Dearborn St.
New York, N. Y.—Wyckoff Pipe & Creosoting Co., 30 E. 42nd St.
Scranton, Pa. — Scranton Supply & Machinery Co.

MILLER-OWEN ELECTRIC CO., THE 374
217-219 First Ave., Pittsburgh, Pa.

List of Firms Catalogued, Branch Offices, Representatives and Agencies----Cont.

MILWAUKEE LOCOMOTIVE MFG. CO. 476
Milwaukee, Wis.
Sales Offices:
Knoxville, Tenn.—1005 Bank & Trust Bldg.
Pittsburgh, Pa. — 307-309 Westinghouse Bldg.
Agents:
San Francisco, Cal.—Eccles & Smith Co.
Seattle, Wash. — Contractors Equipment Co.

MINE SAFETY APPLIANCES CO..590
541 4th Ave., Pittsburgh, Pa.
Representatives:
Charleston, W. Va.
Huntington, W. Va.
Salt Lake City, Utah.
San Francisco, Cal.
Scranton, Pa.
Walsenburg, Colo.

MINERS' SUPPLY CO...............572
St. Clair, Pa.
Agencies:
Florence, Neb.—E. I. du Pont Powder Co.
Louviers, Colo.—E. I. du Pont Powder Co.
St. Louis, Mo.—E. I. du Pont Powder Co.

MINES OTOLOK CHECK CO., INC., THE 364
House Bldg., Pittsburgh, Pa.

MITCHELL, W. K. & CO..........214
29th and Ellsworth Sts., Philadelphia, Pa.

MOLONEY ELECTRIC CO..........548
St. Louis, Mo.
Branch Offices:
Chicago, Ill.
Montreal, Que.
New York, N. Y.
San Francisco, Cal.
Toronto, Canada.
Winnipeg, Mo.

MONARCH REFILLABLE FUSE CO. 545
Buffalo, N. Y.

MONTGOMERY COAL WASHING & MFG. CO. 108
Birmingham, Ala.
Agencies:
Knoxville, Tenn. — Webster & Co., P. O. Box 1005.
Seattle, Wash.—Percy E. Wright, 422 New York Block.

MOON, GEORGE C., CO., INC......326
124-26 White St., New York, N. Y.

MORGAN-GARDNER ELECTRIC CO. 461-494
Chicago, Ill.
Agents:
Cleveland, O.—Cooke-Wilson Electric Co.
Cleveland, O.—Cooke-Walson Electric Supply Co.
Pittsburgh, Pa. — Cooke-Wilson Electric Supply Co.

MORRIS MACHINE WORKS.......434
Baldwinsville, N. Y.
Branch Offices:
Charlotte, N. C.—Realty Bldg.
New York, N. Y.—39-41 Cortlandt St.
Representatives:
Boston, Mass.—Fred Goldthwait, 110 Pearl St.
Butte, Mont.—Western Mining Supply Co.
Buffalo, N. Y.—Root Neal & Co.
Charleston, S. C.—Cameron & Barkley Co.
Chicago, Ill.—Henion & Hubbell, 217 N. Jefferson St.
Cleveland, O. — Strong-Carlisle-Hammond Co.
Denver, Colo.—Mine & Smelter Supply Co.
Detroit, Mich.—Chas. J. Diederich.
Houston, Tex.—H. A. Paine.
Kansas City, Mo. — English Tool & Supply Co.
Los Angeles, Cal.—Harron, Rickard & McCone.
New Orleans, La.—John H. Murphy Co.
Philadelphia, Pa.—J. J. Shannon & Co., 1744 Market St.
Pittsburgh, Pa.—Harris Pump & Supply Co.
Portland, Ore. — Zimmerman, Wells-Brown Co.
St. Louis, Mo.—N. O. Nelson Mfg. Co.
St. Paul, Minn. — Robinson Cary & Sands Co.
Seattle, Wash. — Hallidie Machinery Co.
San Francisco, Cal.—Harron, Rickard & McCone.
Tampa, Fla.—Cameron & Barkley Co.
Canadian Offices:
Montreal, Que., Can.—Storey Pump & Equipment Co.
Toronto, Ont., Can.—Storey Pump & Equipment Co.

MORROW MFG. CO., THE..........105
Wellston, Ohio.

N

NATIONAL ROOFING CO., THE 162-163
Tonawanda, N. Y.
Agencies:
Baltimore, Md. — Thomas Roofing & Paint Co., 1048 W. Baltimore St.
Binghamton, N. Y.—Gillett Barnes, 91 State St.
Buffalo, N. Y.—Cordes, Ayrault & Co., 51 Broadway.
Cleveland, O. — National Roofing & Paint Co., 6318 Kinsman Road.
Des Moines, Ia.—National Roofing & Supply Co., Third and Market Sts.
Detroit, Mich. — National Roofing & Paint Co., 395 Michigan Ave.
East Baltimore, Md.—Clarke, Asphalt Roofing & Paint Co., 546 Monument St.
Louisville, Ky.—Central Paint & Roofing Co., 314 W. Main St.
Milwaukee, Wis.—Cream City Roofing & Paint Co., 219 Eighth St.
New Orleans, La. — Kracke-Flanders Co., 715 Perdido St.
Niagara Falls, N. Y.—Cordes, Ayrault & Co., 1405 Main St.
Philadelphia, Pa.—H. Loeb & Son, 33rd and Master Sts.
Providence, R. I.—Narragansett Supply Co., 830 Eddy St.
St. Paul, Minn.—F. G. Leslie Co.
Syracuse, N. Y. — Onondaga Bldg. Supply Co., 569 So. Clinton St.

NATIONAL TUBE CO.
446-447-448-449-450-451-452-453-454-455
Frick Bldg., Pittsburgh, Pa.
Branch Offices:
Atlanta, Ga.—Candler Bldg.
Boston, Mass.—John Hancock Bldg.
Chicago, Ill.—208 So. LaSalle St.
Denver, Colo.—Majestic Bldg.
Kansas City, Mo.—R. A. Long Bldg.
New Orleans, La.—Maison Blanche.
New York, N. Y. — Hudson Terminal Bldg.
Omaha, Neb.—City National Bank Bldg.
Philadelphia, Pa.—Widener Bldg.
Pittsburgh, Pa.—Frick Bldg.
St. Louis, Mo.—Third National Bank Bldg.
St. Paul, Minn.—Pioneer Bldg.
Salt Lake City, Utah.—Walker Bank Bldg.
Pacific Coast Representatives:
Los Angeles, Cal.—Central Ave. and Jackson St.
Portland, Ore.—Selling Bldg.
Seattle, Wash.—Fourth Ave., S. (Cor. Connecticut).
San Francisco, Cal.—Rialto Bldg.

NATIONAL VALVE & MFG. CO....215
31st St. and Liberty Ave., Pittsburgh, Pa.
Branch Offices:
Atlanta, Ga.—E. F. Scott, 702 Candler Bldg.
Chicago, Ill.—E. J. Ward, Westminster Bldg.
Cleveland, O.—L. S. Garrett, New England Bldg.
Indianapolis, Ind. — I. C. DeHaven, State Life Bldg.
Philadelphia, Pa.—National Supply & Equip. Co., Bulletin Bldg.

NEW JERSEY CAR SPRING & RUBBER CO. 240
Jersey City, N. J.
Branch Offices:
Atlanta, Ga.—E. C. Atkins & Co.
Birmingham, Ala. — Moore-Handley Hardware Co.
Chicago, Ill.—New Jersey Car Spring & Rubber Co., 55 West Lake St.
Cincinnati, O.—J. R. Wood Supply Co.
Cleveland, O.—Philpott Rubber Co.
Los Angeles, Cal.—Bennett-Hubbard Rubber Co., 1315 Figueroa St., S.
Memphis, Tenn.—E. C. Atkins & Co.
Philadelphia, Pa. — New Jersey Car Spring & Rubber Co., 324 Lafayette Bldg.
Pittsburgh, Pa. — Steam Equipment Mfg. Co., Jenkins Arcade Bldg.

NEW YORK & NEW JERSEY LUBRICANT CO. 256
165 Broadway, New York, N. Y.
Branch Offices:
Charleston, W. Va. — The Kanawha Engineering Co., M. J. Carmack, Mgr., 8 Capital St.
Chicago, Ill.—M. K. Barnes, Mgr., 35 So. Dearborn St.
Knoxville, Tenn.—H. H. Ashmore, 407 Empire Bldg.

NEW YORK BELTING & PACKING CO. 241
91-93 Chambers St., New York, N. Y.
(Factories, Passaic, N. J.)
Branch Offices:
Boston, Mass.—65 Pearl St.
Chicago, Ill.—124-26 W. Lake St.
Philadelphia, Pa.—821-23 Arch St.
Pittsburgh, Pa.—420 First Ave.
St. Louis, Mo.—218-220 Chestnut St.
San Francisco, Cal.—519 Mission St.
Spokane, Wash.—157 So. Monroe St.

NEW YORK CORDAGE CO.........244
83 Wall St., New York, N. Y.

NICHOLSON, W. H., & CO..........234
Wilkes-Barre, Pa.

NIXON MINING DRILL CO........616
Chattanooga, Tenn.

NORTH AMERICAN CONSTRUCTION CO., THE 168
Bay City, Mich.

NORTHEASTERN CO., THE........159
6 Beacon St., Boston, Mass.
Branch Office:
New York, N. Y.—35 West 32nd St.
Agencies:
Chicago, Ill.—S. Reid Holland, 208 So. LaSalle St.
New Orleans, La.—H. Lynn Beach, 863 Camp St.
Seattle, Wash.—Bertram D. Dean, 2123 L. C. Smith Bldg.

NUTTALL, R. D., CO................482
Pittsburgh, Pa.
Distributors:
Atlanta, Ga. — Geo. E. Watts, 1526 Candler Bldg.
Boston, Mass.—Chas. N. Wood Co., 79 Milk St.
Butte, Mont.—Westinghouse E. & M. Co., Lewishon Bldg.
Chicago, Ill.—Westinghouse E. & M. Co., 39 So. LaSalle St.
Dallas, Tex.—Westinghouse E. & M. Co., 418 Main St.
Denver, Colo.—Westinghouse E. & M. Co., 429 Seventeenth St.
Kansas City, Mo.—Westinghouse E. & M. Co., 1012 Baltimore Ave.
Los Angeles, Cal.—Westinghouse E. & M. Co., I. N. Van Nuys Bldg.
Philadelphia, Pa. — Electric Service Supplies Co., 17th and Cambria Sts.
Pittsburgh, Pa. — Union Electric Co., Terminal Warehouses.
Portland, Ore.—Westinghouse E. & M. Co., Northwestern Bank Bldg.
St. Louis, Mo.—Westinghouse E. & M. Co., National Bank Commerce Bldg.
Salt Lake City, Utah.—Westinghouse E. & M. Co., 212 S. W. Temple St.
San Francisco, Cal.—Westinghouse E. & M. Co., 165 Second St.
Seattle, Wash.—Westinghouse E. & M. Co., Alaska Bldg.
Canadian Distributor:
Montreal, Can.—John Millen & Son.

O

OHIO BRASS CO., THE............524
Mansfield, Ohio.
Branch Offices:
Chicago, Ill.—The Ohio Brass Co., 343 So. Dearborn St.
New York, N. Y.—The Ohio Brass Co., 30 Church St.
Sales Agents:
Birmingham, Ala.—Shook & Fletcher Supply Co.
Charleston, W. Va.—Charleston Electrical Supply Co.
Columbus, O.—Jeffrey Mfg. Co.
Columbus, O.—Columbus Mill & Mine Supply Co.
Denver, Colo. — Hendrie & Bolthoff Mfg. Co.

(Continued on Next Page)

Fairmont, W. Va. — Fairmont Mining Machine Co.
Los Angeles, Cal. — R. D. Holabird, 1208 S. Main St.
Pittsburgh, Pa. — Burt Gellatly, 306 Fourth Ave.
San Francisco, Cal. — Holabird-Reynolds. 525 Mission St.
Wheeling, W. Va.—Sands Electric & Mfg. Co.

Canadian Sales Agent:
Toronto, Ont., Can.—P. A. Hinds, 88 Farnham Ave.

OHIO GREASE CO., THE.......254-255
Loudonville, Ohio.

ORENSTEIN-ARTHUR KOPPEL CO 350
Benedum-Trees Bldg., Pittsburgh, Pa.
General Office:
Koppel, Pa.
Branch Offices:
Chicago, Ill.—Peoples Gas Bldg.
New York, N. Y.—Hudson Terminal Bldg.
San Francisco, Cal.—Rialto Bldg.
Agencies:
Bluefield, W. Va.—Stephen H. Meem Co.
Cleveland, O.—Charles E. Stamp Co.

OSBORN MACHINE CO. 319
DuBois, Pa.

OTTUMWA BOX CAR LOADER CO. 137
Ottumwa, Iowa.
Agent:
Knoxville, Tenn.—Tri-States Machinery Co., 1005 Bank & Trust Bldg.
Alabama.
Kentucky.
Tennessee.
Virginia.

P

PATTERSON, W. F., JR............74
337 Oliver Bldg., Pittsburgh, Pa.
Branch Office:
Waverly, O.

PEASE, C. F., CO., THE...........80
213-231 Institute Place, Chicago, Ill.
Branch Office:
New York, N. Y. — Room 726, 30 Church St.

PEERLESS RUBBER MFG. CO....242
31 Warren St., New York, N. Y.
(Factory, New Durham, N. J.)
Branch Offices:
Boston, Mass.—36 Oliver St.
Chicago, Ill.—130 West Lake St.
Philadelphia, Pa.—122 No 13th St.

PENNSYLVANIA CASTING & MACHINE WORKS 473
505 Preble Ave., N. S., Pittsburgh, Pa.
Branch Offices:
Cleveland, O.—National Car Wheel Co.
New York, N. Y.—National Car Wheel Co., 556 West 34th St.
Rochester, N. Y.—National Car Wheel Co.
Waverly, N. Y.—National Car Wheel Co.

PENNSYLVANIA CRUSHER CO....139
Stephen Girard Bldg., Philadelphia, Pa.
Branch Offices:
Pittsburgh, Pa.—Peoples Bank Bldg.
New York, N. Y.—Hudson Terminal Bldg.
Seattle, Wash.—L. C. Smith Bldg.

PERMUTIT COMPANY, THE.......217
30 E. 42nd St., New York, N. Y.
Representatives:
Buffalo, N. Y.—O. E. Honsberger, 304 Brisbane Bldg.
Chicago, Ill.—B. M. Ferguson, 110 So. Dearborn St.
Cincinnati, O.—Arthur Dechman, 2538 Highland Ave.
Detroit, Mich.—John H. Heath, 1938 Dime Bank Bldg.
Evansville, Ind.—W. H. Durbin, 517 Parrott St.
Great Falls, Mont.—I. E. Leininger, Box 1135.
Indianapolis, Ind. — L. S. Ferguson, 910 Merchants Bank Bldg.
Jacksonville, Fla.—J. Stewart Knight, P. O. Box 1461.
Los Angeles, Cal.—F. H. Cowles, 1140 Citizens Natl. Bank Bldg.
Minneapolis, Minn.—H. G. Taylor, 626 McKnight Bldg.
Philadelphia, Pa.—M. F. Corin, 311 Widener Bldg.
Pueblo, Colo. — Southern Colorado Engr. Co.
St. Louis, Mo. — Reeves & Skinner Machinery Co., 2211 Olive St.
Springfield, O.—Geo. S. Cotter, Springfield Water Works.
Syracuse, N. Y.—J. I. Wile, Box 621, 334 Montgomery St.
West Orange, N. J.—A. T. Smith, 63 Wittingham Place.
Canadian Representatives:
Calgary, Alta.—Theo. Kipp Co., 404 Loughheed Bldg.
Winnipeg, Man. — Theo. Kipp Co., Union Trust Bldg.

PHILADELPHIA STORAGE BATTERIES CO. 472
Ontario and C. Sts., Philadelphia, Pa.
Branch Offices:
Atlanta, Ga.
Boston, Mass.
Chicago, Ill.—1621 S. Michigan Ave.
Cleveland, O.—613 Citizens Bldg.
Denver, Colo.—749 Broadway.
New York, N. Y.—W. L. Thompson, 1789 Broadway.
Pittsburgh, Pa.
Rochester, N. Y.—96 Plymouth Ave.
St. Louis, Mo.—Entz Auto & Battery Co., 5189 Delmar Blvd.
Washington, D. C.—Sterrett & Fleming, 2155 Champlain Ave.

PHILLIPS MINE & MILL SUPPLY CO. 128-351
Pittsburgh, Pa.
Agencies:
Huntington, W. Va. — Miller Supply Co.
Seattle, Wash.—A. F. Blair, C. & M. E.
Canadian Agency:
Lethbridge, Can.—J. B. Turney & Co.

PITTSBURGH CARBON BRUSH CO. 542
512 E. Diamond St., Pittsburgh, Pa.

PITTSBURGH COAL WASHER CO. 106-107
Fulton Bldg., Pittsburgh, Pa.

PITTSBURGH FILTER MFG. CO...218
503 Farmers Bank Bldg., Pittsburgh, Pa.
Branch Office:
Kansas City, Mo.—429 Rialto Bldg.

PITTSBURGH HARNESS SUPPLY.609
Pittsburgh, Pa.

PITTSBURGH KNIFE & FORGE CO. 362
709 Belmont St., N. S., Pittsburgh, Pa.
Agencies:
Huntington, W. Va.—Huntington Supply & Equipment Co.
Middlesboro, Ky.—F. L. Rennebaum.

PITTSBURGH REINFORCED BRAZING & MACH. CO.........375
2525 Liberty Ave., Pittsburgh, Pa.

PLATT IRON WORKS 435
Dayton, Ohio.
Branch Offices and Agents:
Atlanta, Ga.—E. C. Butner, 1019 Empire Bldg.
Baltimore, Md. — Morton McI. Dukehart, 100 West Fayette St.
Boston, Mass. — F. H. Hayes, Mach. Co., 94 Pearl St.
Birmingham, Ala. — Keiser-Geismer Engineering Co., 1308 American Trust Bldg.
Chicago, Ill.—John T. Shay, 1242-43 Monadnock Block.
Cincinnati, O.—W. C. Dunn, 26 Hulbert Block.
Cleveland, O.—H. W. Conrad, 550 Rockefeller Bldg.
Columbia, S. C.—Gibbes Machinery Co.
Dallas, Tex.—Briggs-Weaver Machinery Co.
Dayton, O.—C. M. Kelso Co., 1063-4 Reibold Bldg.
Denver, Colo. — Hendrie & Bolthoff Mfg. Co., 1621-39 17th St.
Detroit, Mich. — H. M. Stark, 1502 Kresge Bldg.
Indianapolis, Ind.—The Shotwell Co., 312 Traction Terminal Bldg.
Jacksonville, Fla. — The Cameron & Barkley Co.
Kansas City, Mo.—Merkle-Hines Machinery Co., 508-511 Interstate Bldg.
Los Angeles, Cal.—Sprado Engineering Co., 704 American Bank Bldg.
Memphis, Tenn. — Hoshall Machinery Co., 828 Bank of Commerce & Trust Bldg.
Mexico City, Mex.—Babcock & Wilcox Co., Apartado, 416.
Minneapolis, Minn.—J. F. Gould, 712 Plymouth Bldg.
Montreal, Can.—Rudel-Belnap Machinery Co., 95 McGill St.
New Orleans, La. — C. T. Patterson Co.
New York, N. Y.—George W. Neff, 50 Church St.
Omaha, Neb. — Merkle-Hines Machinery Co., 1020 W. O. W. Bldg.
Philadelphia, Pa.—W. E. Herring, 1104 Commonwealth Bldg.
Pittsburgh, Pa.—F. G. Otto, 702 Oliver Bldg.
Portland, Ore. — Edward G. Gordon, 224 Pine St.
Richmond, Va. — Hawkins-Hamilton Co., 301 American Natl. Bank Bldg.
San Antonio, Tex.—San Antonio Machine & Supply Co.
San Francisco, Cal. — K. W. Eichelberger, 401 Rialto Bldg.
Salt Lake City, Utah.—E. G. Dewald, 324 Kearns Bldg.
Seattle, Wash. — Hallidie Machinery Co., Occidental Ave. and King St.
Spokane, Wash.—The General Machinery Co., First and Stevens Sts.
Toronto, Can.—Rudel-Belnap Machinery Co., 26 Adelaide St., West.

PNEUMELECTRIC MACHINE CO., THE 311-436-497-501
Syracuse, N. Y.
Branch Offices:
Knoxville, Tenn.—1005 Holston Natl. Bank Bldg.
Pittsburgh, Pa.—2328 Oliver Bldg.
Salt Lake City, Utah.—615-616 Newhouse Bldg.
Canadian Office:
Montreal, Que., Can.—309 West Craig St.
Birmingham, Ala.—General Machinery Co.

PORTER, H. K., CO...............474
Pittsburgh, Pa.
Branch Offices:
Minneapolis, Minn. — J. W. Copeland, Metropolitan Life Bldg.
New Orleans, La.—W. P. Luck, Godchaux Bldg.
New York, N. Y.—Wonham, Bates & Goode, Inc., 17 Battery Place.
Philadelphia, Pa. — J. M. Reed Co., Commercial Trust Bldg.
Salt Lake City, Utah. — Stimpson Equipment Co.
San Francisco, Cal. — N. D. Phelps, Sheldon Bldg.

POST-GLOVER ELECTRIC CO.....533
314-6 W. Fourth St., Cincinnati, O.

PRESSED STEEL CAR CO.. ..352-353
Farmers Bank Bldg., Pittsburgh, Pa.
(Works, Hegewisch, Ill.; McKees Rocks, Pa.; N. S., Pittsburgh, Pa.)
Sales Offices:
Chicago, Ill.—Peoples Gas Bldg.
New York, N. Y.—24 Broad St.
Washington, D. C.—Munsey Bldg.

PROVIDENT LIFE & CASUALTY CO. 596
Provident Bldg., Charleston, W. Va.
Charleston, W. Va.—Paul G. Edmunds, Superintendent of Agents.
Charleston, W. Va.—M. C. Williams, Agency Director.
Branch Offices:
Altoona, Pa.—B. F. McCartney, Dist. Mgr., Altoona Trust Bldg.
Davy, W. Va.—E. L. Hogan, Dist. Mgr.
Huntington, W. Va.—H. H. Huddleston, Dist. Mgr. for Kentucky, 627 Elm St.
Jellico, Tenn. — W. B. Siler, Special Agent for Tennesse and Southeastern Kentucky.
Jenkins, Ky.—John M. McCall, Agent.
La Follett, Tenn.—Wm. Mozingo, Dist. Mgr.
Logan, W. Va.—L. F. Hale, Dist. Mgr.
Matoaka, W. Va.—Hogan & Elliott.
Mt. Hope, W. Va.—R. L. Caviness, Dist. Mgr.
Mullens, W. Va.—Wyoming Insurance Agency.
Prestonsburg, Ky.—W. J. Wark, Agt.
Somerset, Pa.—W. E. Binford, Dist. Mgr.
Williamson, W. Va.—W. R. Duncan, Dist. Mgr.

PROX, FRANK, CO.............506-507
Terre Haute, Ind.

PUNXSUTAWNEY DRILLING & CONTRACTING CO. 68
Punxsutawney, Pa.

List of Firms Catalogued, Branch Offices, Representatives and Agencies---Cont.

Q

QUAKER CITY RUBBER CO.......243
629 Market St., Philadelphia, Pa.
Branch Offices:
Chicago, Ill.—182 W. Lake St.
Pittsburgh, Pa.—211 Wood St.
New York, N. Y.—207 Fulton St.

R

RAND, McNALLY & CO...........619
Chicago, Ill.
Branch Office:
New York, N. Y.—40-42 E. 22nd St.

RANDOLPH-MEANS CO. 81
Oliver Bldg., Pittsburgh, Pa.

REINEKE-WAGNER PUMP & SUPPLY CO. 437
Pittsburgh, Pa.

REMALY MFG. CO.................125
Tamaqua, Pa.

RENTON, WM., INC...............248
Pittsburgh, Pa.

RICHARDS, J. R....................69
Indiana, Pa.

RICHARDSON & CO., INC..........389
Bessemer Bldg., Pittsburgh, Pa.

RIDGWAY DYNAMO & ENGINE CO. 212-213
Ridgway, Pa.
Branch Offices:
Atlanta, Ga.—Walton Bldg.
Boston, Mass.—53 State St.
Chicago, Ill.—Marquette Bldg.
Cincinnati, O.—P. O. Box 747.
Cleveland, O.—Schofield Bldg.
New York, N. Y.—38 W. 32nd St.
Philadelphia, Pa.—Real Estate Trust Bldg.
Pittsburgh, Pa.—Oliver Bldg.
St. Louis, Mo.—Chemical Bldg.
Washington, D. C.—Colorado Bldg.
Wilkes-Barre, Pa.—Second Natl. Bank Bldg.
Agencies:
Denver, Colo.—Lindrooth, Shubart & Co., Boston Bldg.
Minneapolis, Minn.—Pocock & Pollard Co.
Seattle, Wash. — Hallidie Machinery Co., Occidental and King Sts.

ROBERTS & SCHAEFER CO.......109
McCormick Bldg., Chicago, Ill.

ROBINS CONVEYING BELT CO....122
Park Row Bldg., New York, N. Y.
Branch Office:
Chicago, Ill.—Old Colony Bldg.
Agencies:
Birmingham, Ala.—C. B. Davis Eng. Co., Brown-Marx Bldg.
San Francisco, Cal.—The Griffin Co., Alaska Commercial Bldg.
Canadian Agency:
Toronto, Ont., Can.—Gutta Percha & Rubber Co., Ltd.

ROBINSON VENTILATING CO.276-277
8044-45 Jenkins Arcade Bldg., Pittsburgh, Pa.

ROEBLING'S, JOHN A. SONS CO. 327-519
Trenton, N. J.
Branch Offices:
Atlanta, Ga.—69 Walton St.
Chicago, Ill.—165 West Lake St.
Cleveland. O.—701 St. Clair Ave.
Philadelphia, Pa.—627 Market St.
Pittsburgh, Pa.—Sandusky and Robinson Sts.

Roebling's, John A. Sons Co., of New York.
New York, N. Y.—117-121 Liberty St.
Boston, Mass.—93-95 Pearl St.
son Sts.

Roebling's, John A. Sons Co., of California.
Los Angeles, Cal.—216 So. Alameda St.
Portland, Ore.—82 Fourth St.
San Francisco, Cal.—624-646 Folsom St.
Seattle, Wash.—900 First Ave.

ROYER & ZWEIBEL 318
27-29-31 E. North St., Wilkes-Barre, Pa.
Agency:
Pittsburgh, Pa.—Mine & Mill Equip. Co., S. C. Webb, 801 Oliver Bldg.

S

S. K. F. BALL BEARING CO......481
50 Church St., New York, N. Y.
SACKETT MINE SUPPLY CO., THE 534
Columbus, Ohio.
Agent:
Welch, W. Va.—W. P. Sinclair.
Williamson, W. Va.—E. T. Bryant.

SAFETY FIRST SUPPLY CO. 591-592-593
Hartje Office Bldg., Pittsburgh, Pa.

SANFORD DAY IRON WORKS.....354
Knoxville, Tenn.
Branch Offices:
Birmingham, Ala. — 1308 American Trust Bldg.
Evansville, Ind.—W. M. Cowell, P. O. Box 124.
New York, N. Y.—2 Rector St.
Pittsburgh, Pa.—W. O. McKamey, P. O. Box 1413.
Agencies:
Bramwell, W. Va.—H. S. Brown.
Charleston, W. Va.—N. P. Pritchard, P. O. Box 1070.
Charleston, W. Va.—P. J. & C. B. Goodwin, 1 Masonic Temple Bldg.
Denver, Colo.—O. H. Davidson Equipment Co., 1633 Tremont St.
Minneapolis, Minn.—W. M. Ziegler, 320 Temple Court.
Salt Lake City, Utah—O. H. Davidson Equipment Co., Walker Bank Bldg.
Seattle, Wash. — Washington Alaska Purchasing Bureau, 411 Mutual Life Bldg.
Whites Creek, W. Va.—C. F. Millender.
Beckley, W. Va.—M. B. Smith.
Cobalt, Ont.—H. L. Usborne.
Douglas, Ariz.—L. W. Mendenhall, Box 531.
Cumberland, Md.—Chris Himmler, P. O. Box 217.

SCAIFE, WM. B., & SONS CO.......219
221 First Ave., Pittsburgh, Pa.
Branch Office:
New York, N. Y.—26 Cortlandt St.

SCOTTDALE MACHINE & MFG. CO. 110-174
Scottdale, Pa.
Agencies:
Birmingham, Ala.—J. F. Donahoo Co., Jefferson Co. Bank Bldg.
Bluefield, W. Va.—S. H. Meem & Co., 35 Thornton Bldg.
St. Louis, Mo.—Crockwell Mine & Mill Supply Co., Federal Reserve Bank Bldg.

SCRANTON ELECTRIC CONSTRUCTION CO. 502
Connell Bldg., Scranton, Pa.

SIMMONS, JOHN, CO..............585
34 Thirty-fifth St., Brooklyn, N. Y.
Branch Offices:
Salt Lake City, Utah—322 Dooly Bldg.
San Francisco, Cal.—268 Market St.
Springfield, Ill.—1028 E. Madison St.
Canadian Office:
Montreal, Que., Can.—146 Bleury St.

SIMONDS, G. L., & CO.............203
230 LaSalle St., Chicago, Ill.
Agents:
Birmingham, Ala.—McClary-Jemison Mach. Co.
Charlotte, N. C.—James E. Weinhold, Realty Bldg.
Chattanooga, Tenn.—C. E. Moore, 518 Cherry St.
Cleveland, O.—The Hale-Stephan Co., 500 Schofield Bldg.
Denver, Colo.—S. G. Elbe, 1230 16th St.
Detroit, Mich. — Coon-DeVisser Co., Ford Bldg.
Indianapolis, Ind. — Irving C. DeHaven, 1101 State Life Bldg.
Milwaukee, Wis. — Newton-Johnson Sales Engineers, 1002 Majestic Bldg.
New Orleans, La.—Henry J. Malochee, 917 Hennen Bldg.
New York, N. Y.—DeVed-Kissick Co., Singer Bldg.
Omaha, Neb.—F. W. Hay, 1141 South 31st St.
Philadelphia, Pa.—DeVed-Kissick Co., Commonwealth Bldg.
Pittsburgh, Pa. — Service Supply & Equip. Co., Fulton Bldg.
St. Louis, Mo. — Bonsack Machinery Co., 1935 Boatmen's Bank Bldg.
St. Paul, Minn.—Hildred-Nelson Co., 47 East Third St.

SIMS COMPANY, THE 223
Erie, Pa.
Branch Offices and Agencies:
Atlanta, Ga.—Earl F. Scott, Candler Bldg.
Birmingham, Ala. — Moore-Handley Hardware Co.
Chicago, Ill. — B. W. Thurtell, 22 Quincy St.
Denver, Colo.—Mine & Smelter Supply Co.
Huntington, W. Va.—Huntington Supply & Equip. Co.
New York, N. Y.—C. J. Moulton, Room 754 Marbridge Bldg.
Philadelphia, Pa. — Manufacturers Sales Co., 255 N. 12th St.
Pittsburgh, Pa. — Guy L. Andrews, 1732 Buena Vista St.
St. Louis, Mo.—Henry M. Fife, 1111 Holland Bldg.

SOMERS FITLER & TODD CO.....369
327 Water St., Pittsburgh, Pa.

SOUTHERN COUPON COMPANY...620
Birmingham, Ala.

SOUTHERN WHEEL COMPANY...355
Railway Exchange Bldg., St. Louis, Mo.
Branch Office:
Birmingham, Ala.

STANDARD CAST IRON PIPE & FOUNDRY CO. 442-443
Bristol, Pa.
General Sales Office:
Bristol. Pa.
Eastern Sales Office:
New York, N. Y.—30 Church St.

STANDARD CHAIN COMPANY....363
Pittsburgh, Pa.
Branch Offices:
Chicago, Ill.—J. E. Pumphrey, Chicago Athletic Assn.
Denver, Colo.—Duncan Bond, Colorado Natl. Bank Bldg.
New Orleans, La.—Woodward, Wight & Co.
New York, N. Y.—Hendricks & Class, 30 Church St.
Philadelphia, Pa. — Maurice Joy, Franklin Bank Bldg.
San Francisco, Cal.—A. C. Rulofson Co., 315 Monadnock Bldg.
Tacoma, Wash. — Edward Knoble & Son, P. O. Box 1085.

STANDARD RAILWAY SUPPLY CO. 525
4229 Fergus St., Cincinnati, O.

STANDARD SCALE & SUPPLY CO. 132
1631 Liberty Ave., Pittsburgh, Pa.
Branch Offices:
Baltimore, Md.—409-411 N. Gay St.
Chicago, Ill.—1345-47 Wabash Ave.
Cincinnati, O.—212 Walnut St.
Cleveland, O.—Columbus Road.
New York, N. Y.—145 Chambers St.
Philadelphia, Pa.—35 S. Fourth St.

STANDARD WOOD PIPE CO.......445
Williamsport, Pa.

STAR MFG. CO., THE...........356
New Lexington, O.
Agency:
Pittsburgh, Pa.—Wm. J. Harris Co., Bellevue Station.

STEPHENS-ADAMSON MFG. CO. 118-119
Aurora. Ill.
Branch Offices:
Boston, Mass.—Colwell & McMullin, Mgrs., 79 Milk St.
Chicago, Ill.—First Natl. Bank Bldg.
Detroit, Mich.—824 Dime Bank Bldg.
Huntington, W. Va.—First Natl. Bank Bldg.
New York, N. Y.—50 Church St.
Pittsburgh, Pa.—H. W. Oliver Bldg.
St. Louis, Mo.—Federal Reserve Bank Bldg.
Salt Lake City, Utah.—J. W. Gates, Mgr., 503 Dooly Block.
Canadian Office:
Toronto, Ont.—E. J. Bansfield, Agent, 310 Stair Bldg.

STERLING EQUIPMENT & SUPPLY CO. 220
315 Cherry St., Philadelphia, Pa.

List of Firms Catalogued, Branch Offices, Representatives and Agencies---Cont.

THE STONEHOUSE STEEL SIGN COMPANY 594

17th and Lawrence Sts., Denver, Colo.
Agencies:
Birmingham, Ala.—Fossick Co.
Butte, Mont.—Anaconda Copper Mng. Co.
Chicago, Ill.—H. Kohnstamm & Co., 26-28 N. Franklin.
El Paso, Tex. — Monsen-Dunnegan-Ryan Co.
Pittsburgh, Pa.—Mine Safety Appliance Co., 541 Fourth Ave.
San Francisco, Cal.—E. D. Bullard.
Canadian Agency:
Sherbrooke, Que., Can. — Jenckes Mach. Co.

STROMBERG-CARLSON TELEPHONE MFG. CO...........538
Rochester, N. Y.
Branch Offices:
Chicago, Ill.—710 W. Jackson Blvd.
Kansas City, Mo.—1322 Main St.
Canadian Office:
Toronto, Ont., Can.—110 Church St.
Agents:
Charleston, W. Va.—Charleston Electric Supply Co.
Los Angeles, Cal.—Telephone Electric Equip. Co., 901-2 Union Oil Bldg.
New York, N. Y.—American Trading Co., 25 Broad St.
New York, N. Y.—Telephone Sales & Equipment Co., 20 Nassau St.
Pittsburgh, Pa.—Union Electric Co.
Portland, Ore. — Telephone Electric Equipment Co., 410 Lumberman's Bldg.
San Francisco, Cal.—Telephone Electric Equip. Co., 612 Howard St.
Scranton, Pa.—Scranton Electric Construction Co.
Seattle, Wash. — Telephone Electric Equip. Co., 1002 First Ave.

STUART, JAMES, & COOKE........82
Charleston, W. Va.
Branch Offices:
New York, N. Y.—Equitable Bldg.
Pittsburgh, Pa.—Commonwealth Bldg.

SULLIVAN MACHINERY CO....70-495
122 So. Michigan Ave., Chicago, Ill.
Branch Offices:
Barre, Vt.
Boston, Mass.—185 Devonshire St.
Butte, Mont.—48 E. Broadway.
Claremont, N. H.
Denver, Colo.—837 Equitable Bldg.
El Paso, Tex.—511 Mills Bldg.
Huntington, W. Va.—841 Court St.
Joplin, Mo.—4th and Wall Sts.
Knoxville, Tenn.—Houston Bldg.
New York, N. Y.—30 Church St.
Pittsburgh, Pa.—Farmers Bank Bldg.
St. Louis, Mo.—Railway Exchange.
Salt Lake City, Utah.—Kearns Bldg.
San Francisco, Cal.—461 Market St.
Spokane, Wash.—Hutton Bldg.
Canadian Offices:
Cobalt, Ont., Can.
Montreal, Que., Can. — Shaughnessy Bldg.
Nelson, B. C., Can.
Vancouver, B. C., Can.—Granville St. Bridge.

SWEET'S STEEL COMPANY......382
Williamsport, Pa.
Branch Offices:
New York, N. Y.—2 Rector St.
Philadelphia, Pa.—Land Title Bldg.
Agencies:
Cleveland, O. — H. D. Cushman Co., 952 Rockefeller Bldg.
Oakland, Cal.—Pelton & Pelton, 2425 Grove St.
Canadian Agency:
Montreal, Can. — Rubinovich & Haskell, 346 Notre Dame St., W.

TAMAQUA MFG. CO...............126
Tamaqua, Pa.

T

TEMPLETON, KENLY & CO., LTD. 607
1020 So. Central Ave., Chicago, Ill.
Agencies:
Alexandria, La. — Brown - Roberts Hardware Co.
Bangor, Me.—Rice & Miller.
Bay City, Mich.—Albert Pipe & Supply Co.
Beaumont, Tex.—W. L. Wilson Hardware Co.
Buffalo, N. Y.—H. D. Taylor Co.
Dallas, Tex.—Moroney Hardware Co.
Davenport, Ia.—Sickels & Preston.
Elmira, N. Y.—Barker, Rose & Clinton Co.
El Paso, Tex. — Krakauer, Zork & Moye Co., Inc.
Grand Rapids, Mich.—Sherwood-Hall Co., Ltd.
Greensboro, N. C. — Odell Hardware Co.
Hartford, Conn. — Hartford Contractors' Supply Co.
Houston, Tex. — Peden Iron & Steel Co.
Indianapolis, Ind.—Van Camp Hdwe & Iron Co.
Indianapolis, Ind. — Vonnegut Hardware Co.
Kansas City, Mo.—Richards & Courtney Co.
Louisville, Ky. — Todd-Donigan Iron Co.
Lynchburg, Va. — Barker-Jennings Hardware Co.
Minneapolis, Minn.—Simmons Hardware Co.
Nashville, Tenn. — Gray & Dudley Hardware Co.
New Orleans, La.—A. Baldwin Co.
New York, N. Y.—Simmons Hardware Co.
Philadelphia, Pa.—Simmons Hardware Co.
Providence, R. I.—Congdon & Carpenter.
Richmond, Va.—Smith-Courtney Co.
St. Louis, Mo. — Simmons Hardware Co.
St. Paul, Minn.—Rank & Goodell.
San Antonio, Tex. — Peden Iron & Steel Co.
Shreveport, La. — W. K. Henderson Iron Works & Supply Co.
Sioux City, Ia.—Simmons Hardware Co.
Sioux Falls, S. D.—Dakota Iron Stores Co.
Springfield, Mass. — Chas. C. Lewis Co.
Toledo, O.—Simmons Hardware Co.
Troy, N. Y.—J. M. Warren & Co.
Tulsa, Okla.—Frick-Reid Supply Co.
Washington, D. C.—J. B. Kendall Co.
Wichita, Kas. — Simmons Hardware Co.
Wilkes-Barre, Pa. — Eastern Penna. Supply Co.
Wilmington, Del. — N. Jacobi Hardware Co.
Worcester, Mass. — Brierly-Lombard Co.
Youngstown, O. — Stambaugh-Thompson Co.

TEXAS COMPANY, THE.......330-331
Texas Company Bldg., Houston, Tex.
Branch Offices:
Atlanta, Ga.—161 W. Georgia Ave.
Birmingham, Ala.—American Bank & Trust Bldg.
Boston, Mass. — Walker Bldg., 120 Boylston St.
Chicago, Ill.—McCormick Bldg.
Dallas, Tex.
Denver, Colo.—First Natl. Bank Bldg.
El Paso, Tex.
New Orleans, La.—Baronne and Girod Sts.
New York, N. Y.—Whitehall Bldg., 17 Battery Place.
Norfolk, Va.—Royster Bldg.
Philadelphia, Pa.—Morris Bldg.

THERMOID RUBBER CO..........320
Trenton, N. J.
Branch Offices:
Boston, Mass.
Chicago, Ill.
Detroit, Mich.
Indianapolis, Ind.
New York, N. Y.
Philadelphia, Pa.
Pittsburgh, Pa.
St. Louis, Mo.
San Francisco, Cal.

TOLEDO PIPE THREADING MACHINE CO. 370
Toledo, Ohio.
Branch Office:
New York, N. Y. — Room 803 Centurian Bldg., 1182 Broadway, Clarence A. Popp.
turian Bldg., Clarence A. Popp.

TOOL STEEL GEAR & PINION COMPANY, THE 483
Elmwood Place, Cincinnati, O.
Agencies:
Chicago, Ill.—U. S. Metal & Mfg. Co., McCormick Bldg.
Denver, Colo.—F. C. Webb, Equitable Bldg.
Huntington, W. Va. — Huntington Supply & Equipment Co.
New York, N. Y.—U. S. Metal & Mfg. Co., 165 Broadway.
Pittsburgh, Pa.—J. P. Biggert, Oliver Bldg.

TRACY, BERTRAND P............508
3201 Penn Ave., Pittsburgh, Pa.

TRANTER MFG. CO. 604
105 Water St., Pittsburgh, Pa.

TURNER, LAURIN H., & CO.......284
160 West Jackson Blvd., Chicago, Ill.
Agencies:
Bluefield, W. Va.—Superior Supply Co.
Pittsburgh, Pa.—Gage & Supply Co.
Pittsburgh, Pa. — Somers, Fitler & Todd.

U

UNION CARBIDE SALES CO.......586
42nd St. Bldg., New York, N. Y.
Chicago, Ill.—Peoples Gas Bldg.
San Francisco, Cal.—Kohl Bldg.
Branch Offices:
Alabama:
Birmingham—1916 Morris Ave.
Mobile—262-268 S. Water St.
Montgomery—114 N. Perry St.
Arizona:
Phoenix—16 S. Central Ave.
California:
Eureka—109 Second St.
Fresno—932 H St.
Los Angeles—639 Gibbon St.
Sacramento—1523-31 Front St.
San Diego—326-336 Fifth St.
San Francisco—Kohl Bldg.
Colorado:
Denver—19th and Wazee Sts.
Victor—Third and Diamond Sts.
Connecticut
Hartford—877 Main St.
District of Columbia
Washington—Maryland Ave. and 9th St., S. W.
Florida:
Jacksonville—106 E. Forsyth St.
Tampa—418 Tampa St.
Georgia:
Atlanta—Cor. Haynes and Rhodes Sts., P. O. Box 1594.
Savannah—Ogeechee Canal, South of Bay St., P. O. Box 78.
Illinois:
Chicago—Peoples Gas Bldg., Michigan Blvd.
Decatur—133-147 W. Williams St.
East St. Louis—600 Walnut Ave.
Marion—315 S. Granite St., Box 747.
Monmouth—601 S. First St.
Peoria—721-731 So. Washington St.
Quincy—222 S. Eighth St.
Streator—702 East Elm St.
Indiana:
Evansville—1601 Illinois St.
Indianapolis—110-112 S. Alabama St.
Terre Haute—921 Wabash Ave.
Iowa
Des Moines—117-119 Fifth St.
Dubuque—8th and Washington Sts.
Ottumwa—207-9-11 S. Washington St.
Sioux City—925 Fourth St., P. O. Box 398.
Kansas:
Pittsburg—109 W. Third St.
Salina—103 S. Fifth St.
Wichita—721 Beacon Bldg.
Kentucky:
Louisville—126 E. Main St.
Louisiana:
New Orleans—715-717 Perdido St.
Maine:
Portland—202 Commercial St.
Maryland:
Baltimore—19 E. Lombard St.
Cumberland—1 N. Liberty St.
Salisbury—Opp. Fulton Station.
Massachusetts:
Boston—(See Cambridge "A").
Cambridge "A" — Waverly St. and Putnam Ave.
Springfield—Napier St.
Michigan:
Detroit — Jefferson Ave. and Orleans St.
Grand Rapids — 135 Ottawa Ave., N. W.
Hancock—First Natl. Bank Bldg.
Iron Mountain—215 E. A St.
Jackson—172 South Water St.
Saginaw—1902 N. Michigan Ave.
Sault Ste. Marie.
Minnesota:
Minneapolis—334 N. First St.
Virginia—413 Chestnut St.
Mississippi:
Vicksburg—1312 Washington St.
Missouri:
Kansas City—1316-1318 W. 8th St.

(Continued on Next Page)

List of Firms Catalogued, Branch Offices, Representatives and Agencies---Cont.

St. Joseph—920 S. 6th St., Sta. "A."
St. Louis—(See East St. Louis, Ill).
Nebraska:
Omaha — 1007-9-11 Jones St., Union Sta. P. O.
New Hampshire:
Concord—77 South Main St.
New Jersey:
Camden—Delaware Ave. and Cooper St.
Jersey City—554-56 Henderson St.
New York:
Albany—108 Third Ave.
Binghamton—21 Jarvis St.
Geneva—Exchange St. and Railroad Place.
Jamaica—11 New York Ave.
Kingston—O'Neil St., near Broadway.
New York City—42nd St. Bldg.
Niagara Falls.
Poughkeepsie—Smith St. and N. Y., N. H. & H. R. R. Tracks.
Roscoe.
Utica—127 Hotel St.
Watertown—438 Court St.
Whitehall—57 Canal St.
North Carolina:
Wilmington—105 North Water St.
North Dakota:
Fargo—17-19 Broadway.
Ohio:
Cincinnati—63-65 Plum St.
Cleveland—601 The Citizens' Bldg.
Columbus—310 Dublin Ave.
Dayton—812-828 E. First St.
Lima—338 East High St.
Toledo—414 S. Erie St.
Zanesville—Main and Second Sts.
Oklahoma:
Oklahoma City—27-29 E. Grand Ave.
Oregon:
Portland—104 North Fifth St.
Pennsylvania:
Beaver.
DuBois—Weber Ave. and Franklin St.
Erie—1426 Chestnut St.
Harrisburg—627 Walnut St.
Johnstown—Messenger St. and B. & O. R. R.
Pittsburgh—32nd St. and Penna. R. R.
Pottsville — Railroad and Sanderson Sts.
Scranton—4 Cliff St.
Williamsport—Canal and Court Sts.
Rhode Island:
Providence—Allen's Ave., P. O. Box 419.
South Carolina:
Charleston—153 Church St.
Tennessee:
Chattanooga—700 E. Tenth St.
Knoxville—426 West Depot Ave.
Memphis—671 South Main St.
Nashville—105-107-109 Broadway.
Texas:
Dallas—802-810 Cadiz St.
El Paso—900 Overland St.
Houston—Baker and Cedar Sts., Box 745.
San Antonio—Cor. Leal and N. Salado Sts.
Waco—633 So. Seventh St.
Utah:
Salt Lake City—118 W. Second South St.
Vermont:
Burlington—87 College St.
Virginia:
Lynchburg—1324 Commerce St.
Norfolk—Cor. First and Front Sts.
Richmond—18th and Cary Sts.
West Virginia:
Bluefield—195 Roanoke St.
Charleston—Broad St. and K. & M. R. R.
Fairmont—"A" St.
Huntington—820 Third Ave.
Washington:
Seattle—1103 First Ave.
Spokane—646 Peyton Bldg.
Wisconsin:
La Crosse—Front and King Sts.
Madison—309 East Wilson St.
Milwaukee—120-134 Jefferson St.

UNION ELECTRIC COMPANY.....535
Terminal Warehouses,
Pittsburgh, Pa.

UNION IRON WORKS.............193
Erie, Pa.
Branch Offices and Agencies:
Buffalo, N. Y.—G. B. Foster, 550 Ellicott Square Bldg.
Chicago, Ill.—Hoyt-Noe Steel Co., Cor. Monroe & Jefferson Sts.
Cincinnati, O.—The Randle Machinery Co.
Cleveland, O.—M. T. Slattery, 550 Rockerfeller Bldg.
Columbus, O.—Scioto Valley Supply Co.
Concord, N. H.—Page Belting Co.
Los Angeles, Cal.—Western Heating Co., Union League Bldg.
New York, N. Y.—Ambrose B. Dean, 39 Cortlandt St.
Philadelphia, Pa.—T. T. Burchfield Co., 54 No. 6th St.
Pittsburgh, Pa. — Dravo-Doyle Co., Diamond Bank Bldg.
Portland, Ore.—J. M. Main & Co.
Richmond, Va.—Hackley Morrison, P. O. Box 120.
Rochester, N. Y.—Barr & Creelman Co.
St. Louis, Mo.—F. C. Schwaner & Co., Bank of Commerce Bldg.
Sherman, Tex.—Hardwicke-Etter Co.
Toledo, O.—W. Hawley, 950 Nicholas Bldg.
Washington, D. C.—L. C. Holmes, Ouray Bldg.
Scranton, Pa.—Scranton Supply & Machinery Co.

UNITED STATES CAST IRON PIPE & FOUNDRY CO. 442-443
Burlington, N. J.
General Sales Office:
Philadelphia, Pa.—1421 Chestnut St.
Branch Sales Offices:
New York, N. Y.—71 Broadway.
Chicago, Ill.—122 So. Michigan Ave.
Birmingham, Ala.—American Trust Bldg.
Kansas City, Mo.—R. A. Long Bldg.
Pittsburgh, Pa.—Oliver Bldg.
St. Louis, Mo.—Security Bldg.
San Francisco, Cal.—Monadnock Bldg.
Portland, Ore.—Northwestern Bank Bldg.

UNITED STATES POWDER CO...571
Terre Haute, Ind.
Branch Office:
Columbus, O.—C. L. Rood, 166 East Frambes Ave.

UNITED STATES RAIL CO........383
Cumberland, Md.

UNIVERSAL LUBRICATOR CO....235
136 Chestnut St., Philadelphia, Pa.

V

VALLEY IRON WORKS...........199
Williamsport, Pa.
Branch Offices:
New York, N. Y. — Room 707, 30 Church St.
Pittsburgh, Pa.—207 Fulton Bldg.

VAN DORN & DUTTON CO., THE..484
2978 Woodhill Road, Cleveland, O.
Sales Offices:
Atlanta, Ga. — J. R. Whitman, 1018 Healey Bldg.
Baltimore, Md.—James Gibbons, 339 Title Bldg.
Chicago, Ill.—Nelson P. Hall, 14 East Jackson Blvd.
Denver, Colo.—O. H. Davidson Equip. Co., 1633 Tremont St.
El Paso, Tex.—F. B. Hitchings, 813 Mills Bldg.
New York, N. Y.—Frank Van Anden, D. S. M., 556 West 34th St.
San Francisco, Cal.—W. B. Wilson, 515 Mission St.
Salt Lake City, Utah. — L. Branderburger, 311 Walker Bank Bldg.
Special Sales Representatives:
Cleveland, O. — Frank Du Gay, 2978 Woodhill Road.
Cleveland, O. — George Stoiber, 2978 Woodhill Road.
Cleveland, O. — L. G. Hewins, 2978 Woodhill Road.
Sales Representatives:
Boston, Mass.—Frank Ridlon Co., 158 Summer St.
Chicago, Ill.—Henderson-Lee Co., 11-17 S. Desplaines St.
Kansas City, Mo.—Satterlee Electric Co., 22-24 East Ninth St.
St. Louis, Mo.—Brown & Hall Supply Co., 1124 Pine St.
St. Louis, Mo.—Grayson Ry. Supply Co., LaSalle Bldg.
St. Louis, Mo.—Wesco Supply Co.
Canadian Representative:
Toronto, Ont.; Can. — C. E. A. Carr, 2 Toronto St.

VOGT, HENRY, MACHINE CO.....194
Louisville, Ky.

VULCAN IRON WORKS....278-312-475
Wilkes-Barre, Pa.
Branch Offices:
Chicago, Ill.—McCormick Bldg.
New York, N. Y.—50 Church St.

W

WALSH & WEIDNER BOILER CO.195
Chattanooga, Tenn.
Branch Offices:
Birmingham, Ala. — G. R. Mueller, Brown-Marx Bldg.
Dallas, Tex. — M. G. Lipscomb, 1308 Busch Bldg.
Knoxville, Tenn. — Tennessee Mill & Mine Supply Co.
Memphis, Tenn. — Hoshall Mach. Co., Bank of Commerce & Trust Bldg.
New Orleans, La.—Friend & Webre, Hibernia Bank Bldg.
Norfolk Va.—Empire Foundry & Machine Co.
San Francisco, Cal. — California Hydraulic Eng. & Supply Co., 70 Fremont Ave.

WARWOOD TOOL COMPANY......617
Wheeling, W. Va.

WATERBURY COMPANY 328
63 Park Row, New York, N. Y.
Agent:
Dallas, Tex.—A. T. Powell & Co., 911 Southwestern Life Bldg.
Branch Offices:
Chicago, Ill.—W. R. Peete, Mgr., 419 West 12th Place.
New Orleans, La. — Wm. Fitzpatrick, 1018 Maison Blanche Bldg.
San Francisco, Cal.—Frank J. Sims, 35-45 Davis St.

WATT MINING CAR WHEEL CO., THE 357
Barnesville, Ohio.
Agencies:
Denver, Colo.—Lindrooth, Shubart & Co.
San Francisco, Cal. — N. D. Phelps, Sheldon Bldg.
...**(Agents in all foreign countries.)**...

WEBSTER MFG. CO., THE........111
Tiffin, Ohio.
Agents:
Atlanta, Ga.—Fulton Supply Co., 86 Marietta St.
Birmingham, Ala. — G. R. Mueller, Brown-Marx Bldg.
Buffalo, N. Y.—G. A. Hancock, 55 Terrace.
Chattanooga, Tenn. — R. R. Nixon, Hamilton Natl. Bank Bldg.
Chicago, Ill.—Webster Mfg. Co., McCormick Bldg.
Columbus, O. — P. W. Holstein, 235 16th Ave.
Denver, Colo.—C. L. Dean, 1718 California Ave.
Detroit, Mich.—Palmer-Bee Co., Grand Blvd.
Douglas, Ariz. — L. W. Mendenhall, 1019 Avenue G.
Knoxville, Tenn. — Webster & Co., Holston Bank Bldg.
Los Angeles, Cal.—F. F. Foster Co., 443 East Third St.
Louisville, Ky.—F. D. Morton & Co., 516 West Main St.
Milwaukee, Wis. — William Classman, Wells Bldg.
New York, N. Y.—Webster Mfg. Co., 90 West St.
Philadelphia, Pa.—Charles Bond Co., 520 Arch St.
Pittsburgh, Pa.—Dempcy-Degener Co., 307 Fourth Ave.
Salt Lake City, Utah.—Utah Engr. & Machy. Co., New House Bldg.
Seattle, Wash.—Brinkley Supply Co., 524 First Ave., South.
Canadian Agent:
Vancouver, B. C. — B. C. Equipment Co., Bank of Ottawa Bldg.

WEIR FROG COMPANY...........396
Cincinnati, Ohio.
Southern Sales Agent:
Washington, D. C.—R. H. Pilson, 809 Munsey Bldg.
Branch Offices:
Cincinnati, O.—C. E. Hogan.
Louisville, Ky.—T. C. Coleman, American Natl. Bank Bldg.
San Francisco, Cal.—Allen L. Wetmore, 614-5 Balboa Bldg.

WELLMAN-SEAVER-MORGAN CO.313
East 70th St. and Central Ave.,
Cleveland, Ohio.
Branch Offices:
Denver, Colo.—612 Ideal Bldg.
New York, N. Y.—50 Church St.

List of Firms Catalogued, Branch Offices, Representatives and Agencies---Cont.

WESTERN ELECTRIC CO.....536--537
463 West St., New York, N. Y.

Branch Offices:
Atlanta, Ga.—230 Lee St.
Boston, Mass.—115 Purchase St.
Buffalo, N. Y.—98 Terrace.
Chicago, Ill.—500 S. Clinton St.
Cincinnati, O.—129 Government Sq.
Cleveland, O.—413-415 Huron Road.
Dallas, Tex.—Pacific Ave. and Ervay St.
Denver, Colo.—1425-27 Curtis St.
Detroit, Mich.—Kirby Ave. and Dequindre St.
Houston, Tex.—1205 Commerce Ave.
Indianapolis, Ind. — 121-123 S. Pennsylvania St.
Kansas City, Mo.—608-610 Wyandotte St.
Los Angeles, Cal.—301 East 8th St.
Milwaukee, Wis.—458 Milwaukee St.
Minneapolis, Minn.—114-120 N. Third St.
New Orleans, La.—309 Magazine St.
New York, N. Y.—463 West St.
Newark, N. J.—64 Park Place.
Oakland, Cal. — Telegraph Ave. and Nineteenth St.
Oklahoma City, Okla.—1 East 6th St.
Omaha, Neb.—802 Farnam St.
Philadelphia, Pa.—11th and York Sts.
Pittsburgh, Pa.—P. O. Box 42.
Portland, Ore.—14 Union Ave.
Richmond, Va.—Sixth and Cary Sts.
St. Louis, Mo.—814 Spruce St.
St. Paul, Minn.—235-7 E. Sixth St.
Salt Lake City, Utah. — 41-43 West Broadway.
San Francisco, Cal.—680 Folsom St.
Savannah, Ga.—210 Bay St.
Seattle, Wash.—907 First Ave.

WEST VIRGINIA RAIL CO., THE 384
Huntington, W. Va.

WESTINGHOUSE AIR BRAKE CO.225
Wilmerding, Pa.
Branch Offices:
Atlanta, Ga.—Candler Bldg.
Boston, Mass.—Exchange Bldg.
Chattanooga, Tenn. — Hamilton Natl. Bank Bldg.
Chicago, Ill.—Railway Exchange Bldg.
Chicago, Ill.—Conway Bldg., 111 W. Washington St.
Columbus, O. — Columbus Savings & Trust Bldg.
Denver, Colo.—Tramway Bldg.
Des Moines, Ia.—Fleming Bldg., 216½ Sixth Ave.
Houston, Tex.—4802 Main St.
Los Angeles, Cal. — Pacific Electric Bldg.
New York, N. Y. — City Investing Bldg.
Pittsburgh, Pa.—Westinghouse Bldg.
Portland, Ore.—Spalding Bldg.
St. Louis, Mo.—Boatmen's Bank Bldg.
St. Paul, Minn.—Endicott Bldg.
Salt Lake City, Utah.—McIntyre Bldg.
San Francisco, Cal.—Pacific Bldg.
Topeka, Kan.—New England Bldg.

WESTINGHOUSE ELECTRIC & MFG. CO. 135-208-209-317-439-464-526
East Pittsburgh, Pa.
Sales Offices:
Atlanta, Ga. — Candler Bldg., 127 Peachtree St.
Baltimore, Md.—Westinghouse Bldg., 121 E. Baltimore St.
Birmingham, Ala.—Brown-Marx Bldg., Bldg., First Ave. and 20th St.
Bluefield, W. Va.—Kelley-Moyer Bldg., Raleigh and Higginbotham Ave.
Boston, Mass.—Safe Deposit & Trust Bldg., 201 Devonshire St.
Buffalo, N. Y.—Ellicott Square Bldg., Ellicott Square.
Butte, Mont. — Montana Electric Co. Bldg., 50-52 East Broadway.
Charleston, W. Va. — Union Trust Bldg., Capitol and Kanawha St.
Charlotte, N. C. — Rooms 409-10-11, Commercial Bank Bldg., Cor. Tryon and Fourth Sts.
Chattanooga, Tenn.—Hamilton National Bank Bldg.
Chicago, Ill.—Conway Bldg., 111 W. Washington St.
Cincinnati, O.—Traction Bldg., Fifth and Walnut Sts.
Cleveland, O. — Swetland Bldg., 1010 Euclid Ave.
Columbus, O. — Interurban Terminal Bldg., Third and Rich Sts.
Dallas, Tex.—Cotton Exchange Bldg., Akard and Wood Sts.
Westinghouse Electric & Mfg. Co. of Texas.
Dayton, O.—Reibold Bldg., Main St.
Denver, Colo.—Gas & Electric Bldg., 910 Fifteenth St.
Des Moines, Ia.—Fleming Bldg., 216½ Sixth Ave.
Detroit, Mich. — Dime Savings Bank Bldg., Fort and Griswold Sts.
El Paso, Tex. — Mills Bldg., Oregon and Mills Sts.
Westinghouse Electric & Mfg. Co. of Texas.
Houston, Tex. — Tel-Electric Bldg., 602 Preston Ave.
Westinghouse Electric & Mfg. Co. of Texas.
Indianapolis, Ind.—Traction Terminal Bldg., Illinois and Market Sts.
Joplin, Mo.—BaSom Bldg., 418 Joplin St.
Kansas City, Mo.—Orear-Leslie Bldg., 1012 Baltimore Ave.
Louisville, Ky. — Paul Jones Bldg., 312 Fourth Ave.
Los Angeles, Cal.—I. N. Van Nuys Bldg., Seventh and Spring Sts.
Memphis, Tenn.—Exchange Bldg., 6 N. Second St.
Milwaukee, Wis.—425 First National Bank Bldg.
Minneapolis, Minn.—Met. Life Insurance Bldg., 119-131 Third St.
New Orleans, La. — Maison Blanche Bldg., 921 Canal St.
New York, N. Y. — City Investing Bldg., 165 Broadway.
Philadelphia, Pa. — North American Bldg., Broad and Samson Sts.
Pittsburgh, Pa. — Union Bank Bldg., 306 Wood St.
Portland, Ore. — Northwestern Bank Bldg., Broadway and Morrison St.
Rochester, N. Y.—Chamber of Commerce Bldg., 119 E. Main St.
St. Louis, Mo.—300 N. Broadway.
Salt Lake City, Utah.—Walker Bank Bldg., Second, South and Main Sts.
San Francisco, Cal. — Electric Bldg., 165 Second St.
Seattle, Wash.—Alaska Bldg., Second and Cherry Sts.
Syracuse, N. Y. — University Bldg., 120 Vanderbilt Square.
Toledo, O.—Ohio Bldg., Madison Ave. and Superior St.
Washington, D. C.—Hibbs Bldg., 723 Fifteenth St., N. W.
Wilkes-Barre, Pa.—Miners Bank Bldg.

WHARTON, WM., JR., & CO., INC...397
25th St. and Washington Ave., Philadelphia, Pa.
Representatives:
Baltimore, Md.—R. C. Hoffman, Jr., J. T. Hill, Continental Bldg.
Boston, Mass.—J. C. Robinson, R. H. Cope, 45 Bromfield St.
Chicago, Ill.—H. F. McDermott, S. A. Llewellyn, J. A. MacFayden, M. Imbrie, 208 S. La Salle St.
New York, N. Y.—George R. Lyman, W. C. Wilson, H. F. Pratt, 30 Church St.
Philadelphia, Pa.—Robert C. McCloy, C. N. Shaffner, W. C. Swartley, R. Sendell, C. W. Schmidt, H. W. Bininger.
Pittsburgh, Pa.—J. S. Morrison, D. L. Swank, J. R. Smith, Oliver Bldg.
San Francisco, Cal.—R. W. Seyms, W. J. McHenry, Insurance Exchange Bldg.
Scranton, Pa.—Chas. Hoover, Connell Bldg.

WHITCOMB, GEO. D., CO......468-477
Rochelle, Ill.
Branch Office:
Pittsburgh, Pa.—1106 House Bldg.
Representatives:
Birmingham, Ala.—A. H. Walstrom.
Bluefield, W. Va.—West Virginia Armature Co.
Knoxville, Tenn.—Charles Wessman.
St. Louis, Mo.—B. L. Beck, American Hotel.
Wilkes-Barre, Pa.—A. R. Renner, 14 Sterling Ave.
Agencies:
Denver, Colo.—Hendrie & Bolthoff M. & S. Co., 1621 Seventeenth St.
Seattle, Wash. — A. H. Cox Co., 309 First Ave.

WICKES BOILER CO., THE........196
Saginaw, Mich.
Branch Offices:
Boston, Mass.—The Wickes Boiler Co., 201 Devonshire St.
Buffalo, N. Y. — The Wickes Boiler Co., 76 West Monroe St.
Detroit, Mich. — The Wickes Boiler Co., 1116 Penobscot Bldg.
New York, N. Y.—The Wickes Boiler Co., 1417 West St. Bldg.
Pittsburgh, Pa. — The Wickes Boiler Co., 904-905 Empire Bldg.
Seattle, Wash. — The Wickes Boiler Co., 4108 White Bldg.

WILLIAMS IMPROVED STRETCHER CO. 595
Wheeling, W. Va.

WILLIAMS PATENT CRUSHER & PULVERIZER CO., THE 140-141
Old Colony Bldg., Chicago, Ill.
Main Office:
St. Louis, Mo.
Branch Office:
Cleveland, O.—226 Engineers Bldg.
Detroit, Mich.—Jas. H. Phinney & Co., Penobscot Bldg.
New York, N. Y.—39 Cortlandt St.
Philadelphia, Pa.—484 The Bourse.
Pittsburgh, Pa.—2223 Farmers Bank Bldg.
Richmond, Va. — Shields M. Bishop, 811 N. Seventeenth St.
San Francisco, Cal.—268 Market St.

WILMOT ENGINEERING CO......127
Hazleton, Pa.

WINSLOW GOVERNMENT STANDARD SCALE WORKS, INC. 133
12th to 13th St. on 6th Ave., Terre Haute, Ind.

WINTERER, HERMAN L..........376
908-910 Beach St., Philadelphia, Pa.
Agent:
Hazleton, Pa.—Fred M. Blethen, 704 Markle Bank Bldg.

WISCONSIN BRIDGE & IRON COMPANY 112
Chicago, Ill.

Agents:
Chicago, Ill. — C. W. Brooks, 1619 Monadnock Bldg.
Detroit, Mich. — Walter T. Curtis, 1362 Penobscot Bldg.
Kansas City, Mo. — W. L. Six, 510 Finance Bldg.

WITHERBEE IGNITER CO. 579
Springfield, Mass.
Agencies:
Denver, Colo.—Western Sales & Supply Co., 370 Gas & Electric Co.
Pittsburgh, Pa. — Rivenburg-Blackwood Co., 5085 Jenkins Arcade Bldg., J. J. Ramsey.
Scranton, Pa.—Rivenburg-Blackwood Co., Coal Exchange Bldg.
Canadian Agency:
Calgary, Alta., Can.—Metals Limited.

WOLF SAFETY LAMP CO. OF AMERICA, INC. 581
47-49 West St., New York, N. Y.
Branch Offices:
Denver, Colo. — Hendrie & Bolthoff Mfg. & Supply Co.
El Paso, Tex. — Krakauer, Zork & Moye, Sucs., Inc.
Globe, Ariz.—Globe Hardware Co.
Pittsburgh, Pa.—Draeger Oxygen Apparatus Co., 422 First Ave.
Salt Lake City, Utah.—H. H. Sanderson, 46 E. Fourth South St.
Canadian Office:
Lethbridge, Alta., Can.—Western Canada Agency, Ltd.

WRIGHT WIRE COMPANY........329
Worcester, Mass.
Branch Offices:
Boston, Mass.—256 Franklin St.
Chicago, Ill.—33 West Austin Ave.
Emlenton, Pa.—Geo. W. Klingler.
New York, N. Y.—256 Broadway.
Philadelphia, Pa.—410 Commerce St.
San Francisco, Cal. — 111 Townsend St.
Tulsa, Okla.—Harry W. Black, Mgr., 302 Pioneer Bldg.

Y

YOUNGSTOWN STEEL CAR CO., THE 358
Youngstown, Ohio.
Branch Offices and Agencies:
New York, N. Y.—J. D. Miller, Taylor Bldg.
Philadelphia, Pa.—C. G. A. Schmidt, Jr., 639 Land Title Bldg.
Salt Lake City, Utah. — Stimpson Equipment Co., Felt Bldg.
San Francisco, Cal.—N. D. Phelps, 505 Sheldon Bldg.
Seattle, Wash.—Raun Engineering & Equipment Co., 936 Henry Bldg.

INDEX OF PRODUCTS

Please bear in mind that this is NOT a Buyer's Guide, but AN INDEX OF PRODUCTS of machinery, equipment, apparatus and supplies mentioned, described, or illustrated in the catalog pages, for instance; if you are seeking information regarding gears for locomotives, look under the general heading of **Gears**, and get the page numbers of the different manufacturers of that commodity, and read their catalog page over carefully for the information desired. With but few exceptions, we have listed the commodity under the main noun, as example; when looking up Safety Lamps, look under the heading **Lamps, Safety**, etc., or Mine Car Wheels, refer to **Wheels, Mine Car**, etc.

We have endeavored to make this Products Index as simple as possible, but in all cases it is expedient to refer to the catalog pages where you can get the addresses, branch offices and trade names of the different firms supplying the commodity you want.

ACETYLINE MINERS' LAMPS.
(See Lamps Carbide.)
ACID RESISTING METALS.
(See Metals—Acid Resisting)
ACCUMULATORS—Electric
(See Batteries—Storage)
ADZES—Trackmen's.
Fulton Tool Co..................614
Hardsocg Co., Martin, The...612-613
Hardsocg Mfg. Co...........612-613
Leetonia Tool Co., The...........615
Warwood Tool Co...............617
AIR COMPRESSORS.
(See Compressors, Air.)
AIR TANKS.
(See Tanks, Air.)
AIR DRILLS.
See Drills, Air.)
AIR SHAFTS.
(See Shafts, Air.)
AMMETERS.
(See also Electric Supplies.)
Iron City Electric Co...........531
Johns, H. W.,-Manville Co........166
Tracy, Bertrand P.............508
ANEMOMETERS.
(See Also Mine Suplies.)
Davis Instrument Mfg. Co., Inc... 77
Elliott, B. K.................... 78
Everhart Brass Works, The......315
Frick & Lindsay Co..........602-603
Mine Safety Appliance Co.......590
ANGLES AND ANGLE IRONS.
(See Structural Material.)
ANNEALED SHEETS.
(See Sheets and Plates.)
ANVILS.
(See Mine Supplies.)
ARC LAMPS.
(See Lamps, Arc and Incandescent.)
ARMATURE BEARINGS.
(See Electrical Repairs.)
ARMATURE COILS.
(See Coils, Armature.)
ARMATURE DISCS.
(See also Electrical Supplies.)
Cleveland Armature Works......549
ARMATURE INSULATION.
(See Electrical Repairs.)
ARMATURE REPAIR MACHINERY
Electric Service Supplies Co...528-529
ARMATURE WINDING.
(See also Electrical Repairs.)
Buettner & Shelburne Machine Co., Inc..................504-505
Cleveland Armature Works.......549
Dudley Electric & Machine Co...550
Electric Service Co..............551
Glow Electric Co.................317
Kester Electric Company.........547
Miller-Owen Electric Co.........374
Sackett Mine Supply Co., The....534
ARMATURE SHAFTS.
(See also Electric Repairs.)
Cleveland Armature Works.......549
Dudley Electric & Machine Co...550
Miller-Owen Electric Co.........374
Kester Electric Company........547
Tracy, Bertrand P.............508
ARRESTERS—Lighting.
(See also Electric Supplies.)
Electric Service Supplies.....528-529
Garton, W. R., Co...............530
Iron City Electric...............531
McCullough, W. T., Electric Co..532
Union Electric Co..............535
Western Electric Co.........536-537
ARTIFICIAL RESPIRATION APPARATUS.
(See also Breathing Apparatus.)
Draeger Oxygen Apparatus Co., The..........................588
Life Saving Devices Co..........589
Mine Safety Appliances Co......590
ASBESTOS BRAKE BLOCK.
Thermoid Rubber Company.......320
ASBESTOS BRAKE LINING.
(See also Asbestos Products and Materials.)
Thermoid Rubber Co............320
ASBESTOS LUMBER.
(See Asbestos Products and Materials.)
ASBESTOS PRODUCTS AND MATERIALS.
Asbestos Protected Metal Co.....164
Keasbey & Mattison Co.........167
Johns-Pratt Co., The............239
Johns, H. W.,-Manville Co........166
Tracy, Bertrand P.............508
ASBESTOS ROOFING.
(See Roofing, Asbestos.)
ASBESTOS SHEATHINGS.
(See Asbestos Products and Materials.)
ASBESTOS SHINGLES.
(See Roofing, Asbestos.)
ASBESTOS SPECIALTIES.
Keasbey & Mattison Co.........167
Johns-Manville, H. W., Co.......166
ASBESTOS WICK.
(See also Mine Supplies.)
Keasbey & Mattison............167
ASBESTOS WOOD.
(See Asbestos Products and Materials.)
ASPHALT FELT.
(See also Roofing.)
National Roofing Co., The....162-163
ASPHALT SHINGLES.
(See Roofing Asphalt.)
AUGURS—Power, Hand, Post.
Fairmont Mining Machinery Co..498
Fulton Tool Co., The............614
Hardsocg, Martin Co., The....612-613
Hardsocg Mfg. Co...........612-613
Howells Mining Drill Co.........500
Leetonia Tool Co., The..........615
Nixon Mining Drill Co..........616
Warwood Tool Co...............617
CABLE CLAMPS.
(See also Electric Supplies.)
Union Electric Company.........535
AUTOMATIC GREASE CUPS.
Universal Lubricator Co., The....235
AUTOMATIC JIG CONTROL.
Elmore, G. H..............116-117
AUTOMATIC REGULATION SAFETY STOPS.
Connellsville Mfg. & Mine Supply 300-301
AUTOMATIC WEIGHING RECORDERS.
(See Weigh Recorders, Automatic.)
AUTOMOTONEER (A Controller Regulator.)
Electric Service Supplies Co..528-529
AWNINGS.
Humphry's, R. A., Sons..........610
AXLES—Locomotive.
Lobdell Car Wheel Co........346-347
Pensylvania Casting & Mach. Co.473
Tracy, Bertrand P.............508
AXLES—Mine Car.
(See Mine Car Axles.)
BABBITT METALS.
(See also Mine Supplies.)
Colonial Supply Co......599-600-601
Everhart Brass Works, The......315
Frick & Lindsay Co..........602-603
Lawrenceville Bronze Co.........605
Tracy, Bertrand P.............508
Union Electric Company.........535
BAGS—Coal and Coke.
Humphrys, R. A., Sons..........610
BAGS—Feed.
Humphrys, R. A., Sons..........610
BAGS—Mail.
Humphrys, R. A., Sons..........610
BAGS—Tool, Linemen's.
Humphrys, R. A., Sons..........610
BALL BEARINGS.
Hess-Bright Mfg. Co., The.......480
S. K. F. Ball Bearing Co.........481
BAND SAWS.
Somers, Fitler & Todd Co........369
BAROMETERS.
Davis Instrument Mfg. Co....... 77
Elliott, B. K., Company......... 78
Mine Safety Appliances Co......590
BARROWS.
(See also Mine Supplies.)
Colonial Supply Co.......599-600-601
Frick & Lindsay Co.........602-603
Howe Scale Co..................131

BARS—Carpenters' Wrecking.
(See also Miners' Tools and Supplies.)
Leetonia Tool Co., The...........615

BARS—Iron and Steel.
(See also Mine Supplies.)
American Car & Foundry Co..336-337
Beck & Corbitt Iron Co..........598

BARS—Iron and Steel.
Colonial Supply Co......599-600-601
Standard Chain Co..............363

BARS—Jimmy and Pinch.
(See also Miners' Tools and Supplies.)
Leetonia Tool Co., The..........615

BARS—Post.
(See also Miners' Tools and Supplies.)
Leetonia Tool Co., The...........615

BARS—Slate.
(See also Miners' Tools and Supplies.)
Leetonia Tool Co., The...........615
Warwood Tool Co...............617
Leetonia Tool Co., The...........615
Hardsocg Mfg. Co...........612-613

BARS—Spike.
Fulton Tool Co. (The)...........614
Hardsocg, Martin, Co., The...612-613

BARS—Splice.
(See Track Accessories.)

BATH ROOM FITTINGS.
Pittsburgh Harness Supply Co...609

BATH ROOM OUTFITS.
Pittsburgh Harness Supply Co...609

BATHS—Shower.
Pittsburgh Harness Supply Co...609

BATTERIES—Dry Cell.
(See Electrical Supplies.)

BATTERIES—Flashlight.
(See Electric Supplies.)

BATTERIES—Blasting.
(See also Blasting Supplies.)
Atlas Powder Co............560-561
Davis Instrument Mfg. Co........ 77
Mine Safety Appliances Co......590

BATTERIES—Storage—For Mine Locomotives.
Edison Storage Battery Co......469
Electric Storage Battery Co., The.470
Gould Storage Battery Co........471
Philadelphia Storage Battery Co..472

BATTERY CONNECTORS.
(See Electric Supplies; also Blasting Supplies.)

BEAMS.
(See Structural Material.)

BEARINGS—Bronze and Acid Resisting Metals.
Lawrenceville Bronze Co.........605

BEARINGS—Ball.
(See Ball Bearings.)

BEARING METAL.
(See Babbitt Metal.)

BEARINGS—Roller.
Hyatt Roller Bearing Co.........359

BEARINGS—For Shafts, Axles, Armatures, Mine Cars, etc.
Connellsville Mfg. & Mine Supply Co. 300-301
Dodge Sales & Engineering Co...245
Hess-Bright Mfg. Co., The........480
Hyatt Roller Bearing Co.........359
Irwin Foundry & Mine Car Co...348
Lawrenceville Bronze Co.........605
S. K. F. Ball Bearing Co.........481
Stephens-Adamson Mfg. Co...118-119

BELT CONVEYORS.
(See Conveyors.)

BELT DRESSING.
Cling Surface Co................246
Main Belting Co.................121

BELTING—Conveyor.
(See Conveyor Belts.)

BELTING—Rubber, Leather and Canvas.
(See Also Mine Supplies.)
Frick & Lindsay Co..........602-603
Goodrich, B. F. Co., The.........120
McCoy-Brandt Machinery Co.....373
Main Belting Co................121
New Jersey Car Spring & Rubber Company 240
New York Belting & Packing Co..241
Peerless Rubber & Mfg. Co......242
Quaker City Rubber Co..........243
Robins Conveying Belt Co........122
Tranter Mfg. Co................604
Winterer, Herman L.............376

BELTING—Transmission.
Goodrich, B. F., Co..............238
Main Belting Co.................121
New Jersey Car Spring & Rubber Co. 240
New York Belting & Packing Co..241
Peerless Rubber Mfg. Co.........242
Quaker City Rubber Co..........243
Robins Conveying Belt Co.......122

BENDERS—Rail.
(See Rail Benders.)

BINDERS—For Briquets.
Malcomson Briquet Engineering Co. 142
Mashek Engineering Co..........143

BIT—Steel.
Fulton Tool Co. (The)...........614
Hardsocg, Martin, Co., The...612-613
Hardsocg Mfg. Co...........612-613
Leetonia Tool Co., The...........615
McKay, James, Company.........361
Pittsburgh Knife & Forge Co.....362
Standard Chain Co..............363
Tracy, Bertrand P..............508
Warwood Tool Company.........617

BITS AND PICKS (For Mining Machines.)
Colonial Supply Co.......599-600-601
Frick & Lindsay Co.........602-603
Fulton Tool Co. (The)...........614
Garton, W. R., Co., The..........530
Hardsocg, Martin, Co., The...612-613
Hardsocg Mfg. Co...........612-613
Leetonia Tool Co., The...........615
Pittsburgh Knife & Forge Co....362
McKay, James, Company.........361
Tracy, Bertrand P...............508
Warwood Tool Company.........617

BLACK AND GALVANIZED SHEETS.
(See Plates and Sheets.)

BLACK POWDER.
(See Blasting Powder.)

BLANKETS.
(See First Aid and Mine Supplies.)

BLASTING CAPS.
(See also Blasting Supplies.)
Aetna Explosives Co., Inc.....558-559
Atlas Powder Co............560-561
Burton Powder Co., The.........566
Du Pont, E. I., De Nemours & Co. 562-563-564-565
Hercules Powder Co......567-568-569

BLASTING MACHINES.
(See also Blasting Supplies.)
Aetna Explosives Co., Inc.....558-559
Atlas Powder Co............560-561
Burton Powder Co., The..........566
Davis Instrument Mfg. Co....... 77
Du Pont, E. I., de Nemours & Co. 562-563-564-565
Hercules Powder Co......567-568-569
Mine Safety Appliances Co......590

BLASTING MAGNETOS.
Davis Instrument Mfg. Co., Inc.. 77

BLASTING MATS.
(See Blasting Supplies.)

BLASTING POWDER.
Aetna Explosives Co., Inc....558-559
Austin Powder Company.........557
Atlas Powder Company......560-561
Burton Powder Co., The.........566
Du Pont, E. I., de Nemours & Co. 562-563-564-565
Hercules Powder Co......567-568-569
King Powder Co.................570
United States Powder Co.........571

BLASTING SUPPLIES.
Aetna Explosives Co., Inc....558-559
Atlas Powder Co.............560-561
Austin Powder Co...............557
Burton Powder Co., The..........566
Du Pont, E. I., de Nemours & Co. 562-563-564-565
Hercules Powder Co......567-568-569
King Powder Co.................570
Miners' Supply Co..............572
United States Powder Co........571

BLOCKS—Mining Machine.
Buettner & Shelburne Machine Co., Inc. 504-505

BLOCK SIGNALS—Electric.
Electric Service Supplies Co..528-529

BLOCKS—Pulley.
(See also Mine Supplies.)
Macomber Whyte Rope Co......325

BLOWERS—Mechanical Draft.
American Blower Co.........267-269
Combustion Engineering Corp.200-201
Coppus Eng. & Equipment Co....202
Kerr Turbine Pump Co..........211
McClave-Brooks Co..............198
Robinson Ventilating Co......276-277

BLUE PRINT FILING CABINETS.
Elliott Co., B. K............... 78
Pease, C. F., Co., The............ 80

BLUE PRINT LAMPS.
Elliott, B. K., Co................ 78
Pease, C. F., Co., The............ 80

BLUE PRINT MACHINE.
Elliott, B. K., Co................ 78
Pease, C. F., Co., The............ 80

BLUE PRINT PAPERS AND CLOTH (Mounted and Unmounted.)
Elliott, B. K., Co............... 78
Pease, C. F., Co., The............ 80

BLUE PRINT WASHING AND DRYING MACHINES.
Pease, C. F., Co., The............ 80

BOILERS—Tubular, Locomotive Type, Internally Fired.
Armstrong Mfg. Co..............197
Brownell Co., The................188
Chandler & Taylor Co...........189
Freeman, S., & Sons, Mfg. Co., The.190
Keeler, E., Co...................192
Houston, Stanwood & Gamble....191
Kingsford Foundry & Machine Works 433
Union Iron Works 193
Vogt, Henry, Machine Co., Inc....194
Vulcan Iron Works..............312
Walsh & Weidner Boiler Co., The.195

BOILERS—Water Tube.
Keeler, E., Co..................192
Kingsford Foundry & Machine Works 433
Union Iron Works...............193
Vogt, Henry, Machine Co., Inc....194
Walsh & Weidner Boiler Co., The.195
Wickes Boiler Co., The..........196

BOILER CASINGS.
Brownell Co., The...............188
Chandler & Taylor Co...........189
Freeman, S., Sons, Mfg. Co., The.190
Houston, Stanwood & Gamble....191
Keeler, E., Co..................192
Union Iron Works...............193
Vogt, Henry, Machine Co., Inc....194
Walsh & Weidner Boiler Co., The.195
Wickes Boiler Co., The..........196

BOILERS—New and Second Hand.
Beck & Corbitt Iron Co..........590
Foster, L. B., Co................385
Green, L. A......................387
Lazarus, M. E., Co., The........388
McCoy-Brandt Machinery Co.....373
Tranter Mfg. Co................604
Winterer, Herman L.............376

BOILERS—Range.
Pittsburgh Harness Supply Co...609

BOILER REPAIRS.
Dudley Electric & Machine Co....550
Osborn Machine Co., The........319

BOILER COMPOUNDS.
Sterling Equipment & Supply Co.220

BOILER COVERING.
Armstrong Cork & Insulation Co..216
Keasby & Mattison 167
Johns, H. W.,-Manville Co.......166

BOILER GRAPHITE.
Dixon, Joseph, Crucible Co.......252
Detroit Graphite Company.......161

BOILER FEED PUMPS.
(See Pumps, Boiler Feed.)

BOILER FEED PURIFICATION.
(See Water Softening Plants.)

BOILER SCALE REMOVER.
Detroit Graphite Company.......161
Simonds, G. L., Co..............203
Sterling Equipment Co..........220

BOILER TUBES.
(See also Mine Supplies.)
Beck & Corbitt Iron Co.........598
Colonial Supply Co......599-600-601
National Tube Co., The......446-455
Walsh & Weidner Boiler Co., The.195

BOILER TUBE EXPANDERS.
Nicholson, W. H., & Co..........234

BOLTS—Carriage.
Graham Nut Company...........360

BOLTS—Expansion.
(See Electric Supplies.)

BOLTS—Foundation.
Graham Nut Co.................360

BOLTS—Pit Car.
Graham Nut Co..................360

BOLTS AND NUTS.
Beck & Corbitt Iron Co..........598
Graham Nut Co.................360

BOLTS—Track.
(See Track Accessories.)
Buckeye Rolling Mill............381
Frank, M. K....................386
Green, L. A., Co................387
Light Ply Equipment Co.........395
Richardson & Co., Inc...........389
Sweet's Steel Co................382
United States Rail Co...........383

BONDS—Rail.
(See Rail Bonds.)

BOND TESTERS.
Union Electric Co...............535

BONDING TOOLS.
Ohio Brass Co., The.............524

BOOKS—Coupon (for Company Stores.)
Allison Coupon Co..............618
Rand, McNally & Co............619
Southern Coupon Co............620

BOOKS—First Aid.
Safety First Supply Co......591-593

BOOMS—Loading.
(See Loading Booms.)

BOOSTERS.
Ridgway Dynamo & Eng. Co..212-213

BORING MILLS.
McCoy-Brandt Machinery Co.....373
Somers, Fitler & Todd...........369

BOX CAR LOADERS.
Fairmont Mining Machinery Co.. 97
Manierre Engineering & Machinery Co........................136
Ottumwa Box Car Loader Co....137

BRACES—Track.
(See Track Accessories.)

BRADFORD BREAKERS.
Pennsylvania Crusher Co........139

BRACES—Rail.
(See Track Accessories.)

BRACES—Timber.
Duff Mfg. Co., The.............606
Templeton, Kenley & Co.........607

BRAKE LINING AND BLOCKS.
Johns, H. W.,-Manville Co........166
Keasbey & Mattison............167
Thermoid Rubber Co............320

BRAKE SHOES.
Cherry Tree Machine Co.........302
Kanawha Mfg. Co...............104

BRASS AND BRONZE CASTING.
(See Casting Brass and Bronze.)

BRATTICE CLOTH.
Colonial Supply Co.......599-600-601
Frick & Lindsay Co..........602-603
Fulton Bag & Cotton Mills.......285
Garton, W. R., Co., The..........530
Goodin, Reid & Co..............283
Humphrys, R. A., Sons..........610
Johnston, Morehouse & Dickey...286
Turner, Laurin H., Co...........284

BRAZING—Reinforced.
Pittsburgh Reinforced Brazing & Machine Co...................375

BREAKER MACHINERY.
Cross Engineering Co............123
Dodge Sales & Engineering Co. 114-115
Elmore, G. H...............116-117
General Electric Co.............134
Hendrick Mfg. Co...............124
Link Belt Co....................103
Remaly Mfg. Co.................125
Stephens-Adamson Mfg. Co...118-119
Tamaqua Mfg. Co...............126
Vulcan Iron Works.......278-312-475
Wilmot Engineering Co..........127
Westinghouse Elec. & Mfg. Co...135

BREAKERS—Circuit.
(See Circuit Breakers.)

BREAST AUGERS.
(See Augers.)

BREAST DRILLS.
Gem Mfg. Co...................247

BREATHING APPARATUS.
Draeger Oxygen Apparatus Co...588
Life Saving Devices Co..........589
Mine Safety Appliances Co......590

BRIDGE PIERS.
Dravo Contracting Co., The....... 71

BRIDGES.
Wisconsin Bridge & Iron Co......112

BRIDGES—Coal Handling and Dock.
Allen & Garcia Co.............. 93
Robins Conveying Belt Company..122
Link Belt Co....................103
Roberts & Schaefer Co...........109
Wellman-Seaver-Morgan Co., The.313
Webster Mfg. Co................111

BRIQUETTING PLANTS.
Malcolmson Briquet Eng. Co.....142
Mashek Engineering Co.........143

BRIQUETTING MACHINERY.
Malcolmson Briquet Eng. Co.....142
Mashek Engineering Co.........143

BRUSH HOLDERS.
(See also Electric Supplies.)
Buettner & Shelburne Machine Co., Inc...................504-505
Cleveland Armature Works.......549

BRUSHES—Carbon.
(See also Electric Supplies.)
Calebaugh Self-Lubricating Carbon Co. 540
Le Valley-Vitae Carbon Brush Co.541
Pittsburgh Carbon Brush Co.....542

BUCKETS.
(See Pails.)

BUCKETS—Elevator and Conveying.

BUCKETS—Elevator.
Cross Engineering Co...........123
Dempcy-Degener Co.............129
Fairmont Mining Mach. Co.....94-99
Hendrick Mfg. Co...............124
Jeffrey Mfg. Co............100-102
Link Belt Co....................103
Remaly Mfg. Co.................125
Robins Conveying Belt Co.......122
Pittsburgh Coal Washery Co.106-107
Scottdale Mach. & Mfg. Co......110
Stephens-Adamson Mfg. Co...118-119
Wellman-Seaver-Morgan Co.......313
Webster Mfg. Co................111

BUCKETS—Grease.
Gem Mfg. Co...................247

BUCKETS—Orange Peel or Clam Shell—(Second Hand.)
Foster, L. B., Co................385
Green, L. A.....................387

BUILDINGS AND STRUCTURES—Wood.
North American Construction Co.168
Allen & Garcia Co.............. 93
Fairmont Mining Machinery Co.94-99
Dempcy-Degener Co.............129
Link Belt Co....................103
Pittsburgh Coal Washer Co...106-107
Roberts & Schaeffer.............109
Scottdale Machinery and Mfg. Co.110
Webster Mfg. Co................111
Wisconsin Bridge & Iron Co.....112

BUSHINGS.
(See also Electric Supplies.)
Buettner & Shelburne Machine Co., Inc. 504-505
Flood City Mfg. Co..........522-523
Garton, W. C., Co...............530
Irwin Foundry & Mine Car Co...348
Tracy, Bertrand P...............508
Western Electric Co..........356-537

CABINETS—First Aid.
Frick & Lindsay Co.........602-603
Mine Safety Appliances Co......590
Safety First Supply Co......591-593

CABLE—Asbestos.
D. & W. Fuse Co................517

CABLE GRIPS.
Litchfield Foundry & Machine Co.310

CABLE PRESERVATIVES.
Burnet Co., The.................332

CABLE—Steel.
(See Wire Rope.)

CABLES—Bare and Insulated.
American Steel & Wire Co.......516
Hazard Mfg. Co.................518
Iron City Electric Co............531
Roebling's, John A., Sons Co.....519

CABLES FOR MINING MACHINES.
(See also Electrical Supplies.)
American Steel & Wire Co.......516
Colonial Supply Co.......599-600-601
Garton, W. R., Co., The..........530
Hazard Manufacturing Co.......518
Iron City Electric Co............531
Post-Glover Electric Co., The.....533
Roebling's, John A., Sons Co.....519
Western Electric Co.........536-537

CABLES—Lead Encased.
American Steel & Wire Co.......516

CADGERS.
Gem Mfg. Co...................247

CAGES—Plain, Self-Dumping and Automatic.
Allen & Garcia Co.............. 93
Allis-Chalmers Mfg. Co..........299
Connellsville Mfg. & Mine Supply Co. 300-301
Diamond Machine Co............308
Duncan Foundry & Machine Works 335
Fairmont Mining Machinery Co.94-99
Robert Holmes & Bros., Inc......306
Morrow Mfg. Co., The...........105

(Continued on Next Page)

Ottumwa Box Car Loader Co.....137
Phillips Mine & Mill Supply Co...128
Scottdale Machine & Mfg. Co....110
Wellman-Seaver-Morgan Co., The.313

CAGE SAFETY APPLIANCES.
Connellsville Mfg. & Mine Supply Co. 300-301
Diamond Machine Co., The.......308
Osborn Machine Co., The.........319

CANS—Oil, Grease and Waste.
Gem Mfg. Co...................247

CANTEEN—(for Carbide, Water and Matches.)
Hardsocg Mfg. Co...........612-613
Hardsocg, Martin, Co., The...612-613

CAP CRIMPERS.
(See also Blasting Supplies.)
Aetna Explosives Co., Inc....558-559
Atlas Powder Co...........560-561
Burton Powder Co., The.........566
Du Pont, E. I., de Nemours & Co. 562-563-564-565
Hercules Powder Co.....567-568-569

CAPS—Miners'.
(See also Miners' Tools and Supplies.)
Hardsocg Mfg. Co...........612-613
Hardsocg, Martin, Co., The..612-613
Leetonia Tool Co., The..........615

CARS—Monitor.
(See Monitors.)

CAR DUMPERS—Railroad.
Wellman-Seaver-Morgan Co., The.313

CAR FEEDERS.
Holmes, Robt., & Bros., Inc..306-307
Scottdale Machine & Mfg. Co....110
Webster Mfg. Co., The..........111

CAR HAULS.
Allen & Garcia Co.............. 93
Dempcy-Degener Co.............129
Fairmont Mining Machinery Co... 98
Jeffrey Mfg. Co., The........100-102
Link Belt Co...................103
Pittsburgh Coal Washer Co...106-107
Scottdale Machine & Mfg. Co.....110
Tamaqua Mfg. Co...............126
Webster Mfg. Co................111
Wilmot Engineering Co..........127

CAR IRONS.
(See Mine Car Irons.)

CAR JACKS.
Duff Mfg. Co...................606
Templeton, Kenly & Co., Ltd....607

CAR LIFTS—Automatic.
Holmes, Robt., & Bros., Inc..306-307

CAR MOVERS AND PUSHERS.
Colonial Supply Co......599-600-601
Fairmont Mining Machinery Co.94-99
Foster, L. B., Co...............385
Hardsocg Mfg. Co..........612-613
Hardsocg, Martin, Co., The..612-613

CAR REPLACERS.
Alexander Car Replacer Mfg. Co., The 485

CAR RETARDERS—Railroad.
Fairmont Mining Machinery Co.. 99

CAR STOPS—Automatic.
Phillips Mine & Mill Supply Co..128

CAR TIPPLES—Rotary.
Wellman-Seaver-Morgan Co., The.313

CAR WHEELS.
(See Mine Car Whels.)

CARS—Contractors and Industrial.
Gustafson Mfg. Co.............338
Southern Wheel Co.............355
Watt Mining Car Wheel Co., The.357
Wellman-Seaver-Morgan Co......313

CARS—Railway Freight.
American Car & Foundry Co.336-337
Light Railway Equipment Co....395
Pressed Steel Car Co........352-353

CARS—Railway Passenger.
American Car & Foundry Co.336-337
Pressed Steel Car Co........352-353

CARS—Second Hand.
Green, L. A....................387
Foster, L. B., Co...............385
Frank, M. K....................386

CARBIDE LAMPS.
(See Lamps, Carbide.)

CARBIDE.
Union Carbide Sales Co.........586

CARBON BRUSHES.
(See also Brushes, Carbon.)
(See also Electric Supplies.)
Calebaugh Self-Lubricating Carbon Co. 540
Cleveland Armature Works......549
Dixon, Joseph, Crucible Co......252
Kester Electric Co.............547
LeValley Vitae Carbon Brush Co.541
McCullough, W. T., Electric Co...532
Pittsburgh Carbon Brush Co....542
Tracy, Bertrand P..............508
Union Electric Co..............535
Western Electric Co........536-537

CARBON BRUSH HOLDERS.
Western Electric Co.........536-537

CARBON LAMPS.
(See Lamps, Arc and Incandescent.)

CASES—First Aid.
Safety First Supply Co......591-593

CASING—Steam Pipe.
(See Pipe Covering.)

CASINGS—Steel for Fans.
Jeffrey Mfg. Co., The....272-273-274

CAST IRON PIPE.
(See Pipe, Cast Iron.)

CASTINGS—Brass and Bronze.
Cherry Tree Machine Co.........302
Connellsville Mfg. & Mine Supply Co. 300-301
Dudley Electric & Machine Co...550
Everhart Brass Works, The.....315
Flood City Mfg. Co.........522-523
Holmes, Robert, & Bros., Inc....306
Lawrenceville Bronze Co........605
McClave-Brooks Co.............198
Osborne Machine Co., The.......319

CASTINGS—Iron and Steel.
Cherry Tree Machine Co........302
Connellsville Mfg. & Mine Supply Co. 300-301
Gustafson Mfg. Co............338
Holmes, Robert, & Bros., Inc....306
Houston, Stanwood & Gamble...191
Irwin Foundry & Mine Car Co...348
Kanawha Mfg. Co.............104
McClave-Brooks Co. 198
Osborn Machine Co., The........319
Robins Conveying Belt Co.......122
Southern Wheel Co............355
Vogt, Henry, Machine Co., Inc...194

CASTINGS—Brazing and Welding.
Pittsburgh Reinforced Brazing & Machine Co. 375

CASTINGS—Manganese.
Elliot Frog & Switch Co........392

CEMENT—Commutator.
(See Electric Supplies.

CEMENT—Gun.
Cement-Gun Co., Inc............ 75

CEMENT—Roofing.
General Roofing Mfg. Co........165
Johns, H. W.,-Manville Co.......166
National Roofing Co., The...162-163

CENTRIFUGAL DRYERS.
Elmore, G. H.................116-117

CHAINS.
Colonial Supply Co......599-600-601
McKay, James, Co.............361
Pittsburgh Coal Washer Co..106-107
Standard Chain Co............363
Templeton, Kenley & Co........607

CHAIN BELTING.
Cross Engineering Co...........123
Pittsburgh Coal Washery Co.106-107
Jeffrey Mfg. Co., The........100-102
Link-Belt Co. 279
Tamaqua Mfg. Co..............126
Webster Mfg. Co..............111
Wilmot Engineering Co.........127

CHAIN GUIDES—For Mining Machines.
Buettner & Shelburne Machine Co., Inc. 504-505
Prox, Frank, Co.............506-507
Tracy, Bertrand P.............508

CHAIN—Silent (For Power Transmission.)
Link-Belt Co. 279

CHANNELS.
(See Structural Material.)

CHARTS—First Aid.
Safety First Supply Co......591-593

CHECKLOCK.
Mines Otolok Check Co., Inc., The.364

CHECKS—Brass.
(See also Mine Supplies.)
Colonial Supply Co......599-600-601

CHUTES.
Cross Engineering Co...........123
Fairmont Mining Machinery Co.94-99
Hendrick Mfg. Co..............124
Holmes, Robert, & Bros., Inc....306
Jeffrey Mfg. Co., The........100-102
Kanawha Mfg. Co..............104
Link-Belt Co. 103
Phillips Mine & Mill Supply Co...128
Pittsburgh Coal Washer Co..106-107
Remaly Mfg. Co., Inc...........125
Scottdale Machine & Mfg. Co....110
Stephens-Adamson Mfg. Co...118-119
Tamaqua Mfg. Co..............126
Webster Mfg. Co...............111

CHUTES—Spiral.
Anthracite Separator Co.........113
Connellsville Mfg. & Mine Supply Co. 300-301
Holmes, Robert, & Bros., Inc....306
Jeffrey Mfg. Co............100-102
Pittsburgh Coal Washer Co..106-107
Stephens-Adamson Mfg. Co..118-119

CIRCUIT BREAKERS.
(See also Electric Supplies.)
Electric Service Supplies Co..528-529
Flood City Mfg. Co..........522-523
Iron City Electric Co...........531
Tracy, Bertrand P..............508
Western Electric Co.........536-537

CIRCUIT BREAKERS—Automatic Reclosing.
Automatic Reclosing Circuit Breaker Co., The.............539
Iron City Electric Co...........531

CLAMPS—Rail.
(See Track Accessories.)

CLAMPS—Trolley.
(See also Line Material.)
Electric Railway Equipment Co...520
Electric Service Supplies Co..528-529
General Electric Co............521
Union Electric Co..............535
Western Electric Co.........536-537
Westinghouse Electric & Mfg. Co.526

CLEANERS—Coal.
Pennsylvania Crusher Co........139

CLIPS—Wire Rope.
(See Wire Rope Fittings.)

CLOTHING—Oiled.
Humphry's, R. A., Sons..........610

CLOTHING—Rubber.
Humphrey's, R. A., Sons........610

CLUTCHES.
(See also Transmission Machinery.)
Allis-Chalmers Co. 204-205
Dodge Sales & Engineering Co...245
Jeffrey Mfg. Co.............100-102
Link-Belt Co. 103
Stephens-Adamson Mfg. Co...118-119
Tracy, Bertrand P..............508
Webster Mfg. Co., The..........111

COAL HANDLING BRIDGES.
(See Bridges, Coal Handling.)

COAL BARGE CONSTRUCTION—All Steel.
Dravo Contracting Co., The...... 71

COAL CHARGING LARRIES.
Connellsville Mfg. & Mine Supply Co. 300-301
Scottdale Machinery & Mfg. Co..174

COAL CUTTERS.
(See Mining Machines.)

COAL PREPARATION.
Allen & Garcia Co.............. 93
Anthracite Separator Co.........113
Cross Engineering Co...........123
Elmore, G. H...............116-117
Fairmont Mining Machinery Co.94-99
Jeffrey Mfg. Co.............100-102
Link-Belt Co. 103
Montgomery Coal Washing & Mfg. Co. 108
Morrow Mfg. Co., The...........105
Phillips Mine & Mill Supply Co. 128-351
Roberts & Schaefer Co...........109
Tamaqua Mfg. Co................126
Webster Mfg. Co................111
Wilmot Engineering Co..........127

COAL LAND TESTING.
(See Testing Coal Land.)

COAL TAR PRODUCTS.
Barret Co., The.................156

COAL TIPPLES.
(See Tipples.)

COAL WASHERIES.
(See Washeries.)

COALING STATIONS.
Pittsburgh Coal Washer Co...106-107
Roberts & Schaefer Co..........109

COATS—Rubber.
Humphrey's, R. A., Sons.........610

COATS—Sheepskin Lined.
Humphrey's, R. A., Sons.........610

COATING—Brick and Concrete.
Simonds, G. L., & Co............203

COATING—Cable.
(See also Lubricants.)
Atlantic Refining Co., The.......250
Burnet Co., The.................332
Texas Co., The..............330-331

COCKS—Brass and Bronze.
(See also Mine Supplies.)
Fairbanks Co., The..............229
Homestead Valve Mfg. Co........232
Lawrenceville Bronze Co.........605
National Tube Co., The.......446-455

COILS—Armature, Field and Magnet.
(See also Electrical Repairs and Supplies.)
Buettner & Shelburne Machine Co., Inc. 504-505
Cleveland Armature Works......549
Dudley Electric & Machine Co...550
Electric Service Co., Inc., The....551
Electric Service Supplies Co..528-529
Glow Electric Co., The...........372
Kester Electric Co...............547
Tracy, Bertrand P..............508
Western Electric Co..........536-537

COKE HANDLING PLANTS.
Pittsburgh Coal Washer Co...106-107

COKE OVEN CASTINGS.
(See also Castings, Iron and Steel.)
Irwin Foundry & Mine Car Co....348
Kanawha Mfg. Co................104

COKE OVEN PUSHERS, LEVELERS, QUENCHERS, CONVEYORS.
Connellsville Mfg. & Mine Supply Co. 300-301
Scottdale Machine & Mfg. Co....174
Wellman-Seaver-Morgan Co......313

COLD CHISELS.
Leetonia Tool Co., The..........615

COLD STORAGE ROOMS.
Howe Scale Co., The.............131

COLLARS FOR MINE CAR AXLES.
Graham Nut Co..................360

COLLARS—Pulley.
(See also Transmission Machinery.)
Dodge Sales & Engineering Co...245
Tamaqua Mfg. Co...............126

COMBUSTION SYSTEMS.
Combustion Engineering Corp.200-201

COMMUTATORS.
(See also Electric Supplies.)
Buettner & Shelburne Machine Co., Inc. 504-505
Cleveland Armature Works......549
Dudley Electric & Machine Co....550
Electric Service Co..............551
Electric Service Supplies Co..528-529
Garton, W. R., Co., The..........530
Glow Electric Co................372
Kester Electric Co..............547
Tracy, Bertrand P..............508
Western Electric Co..........536-537

COMMUTATORS—Compound.
(See also Electric Supplies.)
Ohio Grease Co., The.........254-255

COMMUTATOR REPAIRS.
Cleveland Armature Works......549
Dudley Electric & Machine Co...550
Electric Service Co..............551
Garton, W. R., & Co.............530
Glow Electric Co., The...........372
Iron City Electric Co............531
Miller-Owen Electric Co.........374
Sackett Mine Supply Co.........534
Western Electric Co..........536-537

COMPASSES.
Elliott, B. K., Co................ 78

COMPASS—Sighting.
Davis Instrument Mfg. Co........ 77

COMPRESSORS—Air.
Allis-Chalmers Mfg. Co.......204-205
American Steam Pump Co.......414
General Electric Co.............206
Ingersoll-Rand Co..............224
McCoy-Brandt Machinery Co.....373
Platt Iron Works...............435
Sullivan Machinery Co........... 70
Tranter Mfg. Co................604
Westinghouse Air Brake Co......225
Winterer, Herman L.............376

COMPRESSORS—Portable.
Allis-Chalmers Co. 204-205
Ingersoll-Rand Co. 221
Sullivan Machinery Co........... 70
Westinghouse Air Brake Co......225

COMPRESSORS—Turbo.
Ingersoll-Rand Co...............224

COMPRESSORS—New and Second Hand.
Foster, L. B., Co.. 385
Green, L. A.....................387
Lazarus, M. E., Co., The.........388
McCoy-Brandt Machinery Co.....373
Miller-Owen Electric Co., Inc.....374

CONCRETE MIXERS.
Foster, L. B., Co................385
Green, L. A.....................387
Standard Scale & Supply Co., The.132

CONCRETE WORK—Shafts, &c.
Dravo Contracting Co............ 71
Ferranti Contracting Co., Inc., The 72
Hyde, W. H..................... 73
Patterson, W. F................. 74
Johannessen, J., & Son........... 67

CONCRETE REINFORCEMENT BARS.
Sweet's Steel Co................382

CONDENSERS.
Allis-Chalmers Mfg. Co......204-205
Epping-Carpenter Pump Co......430
Ingersoll-Rand Co. 221
Westinghouse Elec. & Mfg. Co.208-209

CONDUITS.
(See Electric Supplies.)

CONDULETS.
(See Electric Supplies.)

CONNECTING WIRE.
(See Blasting Supplies.)

CONTRACTORS—Shaft Sinking and General Mining Work.
Drake, A. W., Drilling Co........ 65
Dravo Contracting Co., The...... 71
Ferranti Contracting Co., Inc., The 72
Hyde, W. H..................... 73

CONTRACTORS—Water Supply.
Drake, A. W., Drilling Co........ 65

CONTRACTORS—Steam.
Mitchell, W. K., & Co., Inc.......214

CONTROLLERS FOR ALL CLASSES OF MINING EQUIPMENT.
Cutler-Hammer Mfg. Co.....280-281
Cherry Tree Machine Co.........302
Jeffrey Mfg. Co., The........462-463

CONVEYORS.
Dempcy-Degener Co. 129
Dodge Sales & Engineering Co. 114-115
Elmore, G. H...............116-117
Fairmont Mining Machinery Co94-99
Jeffrey Mfg. Co.............100-102
Link-Belt Co. 103
Main Belting Co................121
Montgomery Coal Washing & Mfg. Co. 108
Morrow Mfg. Co., The...........105
Pittsburgh Coal Washer Co..106-107
Roberts & Schaefer Co.........109
Robins Conveying Belt Co.......122
Scottdale Machine & Mfg. Co....110
Stephens-Adamson Mfg. Co..118-119
Tamaqua Mfg. Co...............126
Webster Mfg. Co., The..........111
Wilmot Engineering Co..........127

CONVEYOR BELTS.
Goodrich, B. F., Co., The........120
Main Belting Co................121
New Jersey Car Spring & Rubber Co. 240
New York Belting & Packing Co.241
Peerless Rubber Mfg. Co........242
Quaker City Rubber Co..........243
Robins Conveying Belt Co.......122

CONVEYORS—Cable.
Fairmont Mining Machinery Co.94-99
Jeffrey Mfg. Co.............100-102
Stephens-Adamson Mfg. Co..118-119

CONVEYORS—Accessories.
Jeffrey Mfg. Co............100-102
Main Belting Co.................121
Pittsburgh Coal Washer Co..106-107
Robins Conveying Belt Co.......122
Stephens-Adamson Mfg. Co..118-119

CONVEYORS—Retarding.
Fairmont Mining Machinery Co.94-99
Jeffrey Mfg. Co.............100-102
Link-Belt Co. 103
Pittsburgh Coal Washer Co..106-107
Roberts & Schaefer Co..........109
Scottdale Machinery & Mfg. Co...110
Stephens-Adamson Mfg. Co.118-119
Webster Mfg. Co., The..........111

COOLING TABLES.
Mashek Engineering Co.........143

CORDAGE.
(See Rope and Cordage.)

CORD—Heater.
D. & W. Fuse Co...............517

COTTON DUCK.
Humphry's, R. A. Sons.........610

COUPON BOOKS—For Company Stores.
Allison Coupon Co..............618
Rand, McNally & Co...........619
Southern Coupon Co............620

COUNTERS—Revolution.
American Steam Gauge & Valve Mfg. Co. 226

COUPLINGS—Shaft and Pulley.
(See also Transmission Machinery.)
Dodge Sales & Engineering Co...245
Nicholson, W. H., & Co.........234
Union Electric Co..............535

COVERING—Pipe.
(See Pipe Covering.)
COVERS—Auto.
Humphry's, R. A., Sons..........610
COVERS—Wagon, Canvas, Etc.
Humphry's, R. A., Sons.........610
CRANES—Locomotive, New and Second Hand.
McCoy-Brandt Machinery Co.....373
CREOSOTE, OILS AND STAINS.
Barrett Co., The................156
Cabot, Samuel, Inc..............157
CROSS ARMS.
(See Electric Supplies.)
CROSSINGS AND CROSSOVERS.
Cincinnati Frog & Switch Co., The 390
Elliot Frog & Switch Co.........392
Indianapolis Switch & Frog Co., The 393
Kilby Frog & Switch Co........394
Light Railway Equipment Co....395
Weir Frog Co...................396
Wharton, William, Jr., & Co., Inc.397
CROSSINGS AND CROSSOVERS—Trolley.
(See Line Material.)
CROW BARS.
(See Miners' Tools and Supplies.)
CRUSHERS.
Allis-Chalmers Mfg. Co......204-205
Connellsville Mfg. & Mine Supply Co. 300-301
Dempcy-Degener Co. 129
Elmore, G. H................116-117
Jeffrey Mfg. Co., The...........138
Link-Belt Co. 103
Mashek Engineering Co..........143
McCoy-Brandt Machinery Co.....373
Pennsylvania Crusher Co........139
Pittsburgh Coal Washer Co..106-107
Robins Conveying Co............122
Scottdale Machine & Mfg. Co....110
Webster Mfg. Co., The..........111
Williams Patent Crusher & Pulverizer Co., The...........140-141
CRUSHER ROLLS.
Allis-Chalmers Mfg. Co......204-205
Cross Engineering Co...........123
Pennsylvania Crusher Co........139
Tamaqua Mfg. Co................126
Williams Patent Crusher & Pulverizer Co., The...........140-141
Wilmot Engineering Co..........127
CRUSHERS—Second Hand.
Green, L. A....................387
CUPS—Compression.
Ohio Grease Co., The........254-255
Universal Lubricator Co.........235
CUPS—Grease.
(See also Mine Supplies.)
Atlantic Refining Co., The.......250
Ohio Grease Co., The........254-255
Universal Lubricator Co.........235
CUTTER CHAINS AND HEADS.
(See also Mining Machines.)
Buettner & Shelburne Machine Co., Inc. 504-505
Goodman Mfg. Co................491
Jeffrey Mfg. Co., The........492-493
Morgan-Gardner Electric Co.....494
Prox, Frank, Co............506-507
Sullivan Machinery Co..........495
Tracy, Bertrand P..............508
CUTTING AND THREADING MACHINES.
Toledo Pipe Threading Machine Co. 370
CUTTING AND WELDING APPARATUS.
Imperial Brass Mfg. Co..........368
CYLINDER REBORING—(Field or Shop.)
Holmes, Robert, & Bros., Inc.....306
Osborne Machine Co., The.......319
Renton, William, Inc............248

DAMPER REGULATORS.
Coppus Engraving & Equipment Co. 202
DAMS.
Dravo Contracting Co., The...... 71
DERRICKS—New and Second Hand.
Foster, L. B., Co................385
Green, L. A.....................387
DIAMOND CORE DRILLING.
(See Drilling, Diamond Core.)
DISC FANS.
Jeffrey Mfg. Co..........272-273-274
DISC VALVES.
(See Valves, Disc.)
DIVIDERS.
(See Mine Supplies.)
DOGS—Cage Safety.
Connellsville Mfg. & Mine Supply Co. 300-301
DRAWING MATERIALS.
Elliott, B. K., Co................ 78
Pease, C. F., Co., The........... 80
DRAWING PENCILS.
(See also Drawing Materials.)
Dixon, Joseph, Crucible Co.......252
DRAFTING ROOM FURNITURE.
Pease, C. F., Co., The.......... 80
DREDGING SLEEVES.
New Jersey Car Spring & Rubber Co. 240
Quaker City Rubber Co..........243
DRILL PRESSES.
Gem Mfg. Co....................247
McCoy-Brandt Machinery Co.....373
Somers, Fitler & Todd Co........369
DRILLING CONTRACTORS.
Drake, A. W., Drilling Co........ 65
Hoffman Bros. 66
Johannessen, J., & Son........... 67
Richards, J. R.................. 69
Punxsutawney Drilling & Contracting Co. 68
Sullivan Machinery Co........... 70
DRILLING—Diamond Core and Hollow Rod.
Drake, A. W., Drilling Co........ 65
Johannessen, J., & Son........... 67
Hoffmann Bros. 66
Punxsutawney Drilling & Contracting Co. 68
Richards, J. R.................. 69
Sullivan Machinery Co........... 70
DRILLS—Breast.
(See Augers, Breast.)
DRILL—Air.
Frick & Lindsay Co..........602-603
Hardsocg, Martin, Co., The....612-613
Hardsocg Mfg. Co...........612-613
Howell's Mining Drill Co.........500
Ingersoll-Rand Co. 496
Nixon Mining Drill Co...........616
Pneumelectric Machine Co., The..501
DRILLS—Electric Coal and Rock.
Fairmont Mining Machinery Co..498
General Electric Co..............499
Howells Mining Drill Co.........500
Jeffrey Mfg. Co., The.........492-493
Pneumelectric Machine Co., The..501
Union Electric Co...............535
DRILLS—Electric Track.
(See also Electric Supplies.)
Electric Service Supplies Co..528-529
Foster, L. B., Co................385
Tracy, Bertrand P..............508
Union Electric Co...............535
DRILLS—Miners' Post, Ratchet and Hand.
(See also Mine Supplies.)
Fairmont Mining Machinery Co..498
Fulton Tool Co., The............614
Hardsocg, Martin, Co., The...612-613
Hardsocg Mfg. Co...........612-613
Howells Mining Drill Co.........500
Jeffrey Mfg. Co., The.........492-493
Leetonia Tool Co., The...........615
Nixon Mining Drill Co...........616
Warwood Tool Co...............617
DRILLS—Radial.
McCoy-Brandt Machinery Co.....373
Somers, Fitler & Todd Co........369
Winterer, Herman L.............376
DRILLING RIGS—Air.
Sullivan Machinery Co........... 70
DRILLS—Rock.
Fairmont Mining Machinery Co..498
Fulton Tool Co., The............614
General Electric Co..............499
Howells Mining Drill Co.........500
Ingersoll-Rand Co...............496
Leetonia Tool Co., The...........615
Nixon Mining Drill Co...........616
Pneumelectric Machine Co., The..501
Scranton Electric Construction Co.502
Sullivan Machinery Co........... 70
Union Electric Co...............535
Warwood Tool Co...............617
DRILLS—Twist.
(See also Mine Supplies.)
Colonial Supply Co.......599-600-601
DRILLS—Upright.
Somers, Fitler & Todd Co........369
DRIVE SPROCKETS.
(See Sprockets.)
DRUMS—Inclined Plane.
Connellsville Mfg. & Mine Supply Co. 300-301
Crawford & McCrimmon Co......303
Diamond Machine Co............308
Phillips Mine & Mill Supply Co..128
Sanford-Day Iron Works.........354
DUCK—Enameled.
Humphreys', R. A., Sons..........610
DUCK—Tarpaulin.
Humphrys', R. A., Sons..........610
DUMP CARS—Slate and Rock.
Connellsville Mfg. & Mine Supply Co. 300-301
Dempcy-Degener Co. 129
Orenstein-Arthur Koppel Co......350
DUMPS—Cross-over, Kickback and Rotary.
Dempcy-Degener Co. 129
Fairmont Mining Machinery Co.94-99
Ottumwa Box Car Loader Co.....137
Phillips Mine & Mill Supply Co..128
Sanford-Day Iron Works.........354
Tamaqua Mfg. Co...............126
DYNAMITE.
Aetna Explosives Co., Inc.....558-559
Atlas Powder Co............560-561
Austin Powder Co..............557
Burton Powder Co., The..........566
Du Pont, E. I., de Nemours & Co. 562-563-564-565
Hercules Powder Co......567-568-569
King Powder Co.................570
DYNAMOS.
(See Motors and Dynamos.)
DYNAMOMETER—Mine Cars.
Hyatt Roller Bearing Co.........359
DRYERS—Coal.
Elmore, G. H................116-117
Link-Belt Co. 103
Roberts & Schaefer Co...........109
DRYERS—Sand.
(See also Mine Supplies.)
Indiana Foundry Co.............486
DRYING APPARATUS.
American Blower Co.........267-269
Ears—Trolley.
(See also Line Materials.)
Electric Service Supplies Co..528-529
EJECTORS.
(See also Mine Supplies.)
Tranter Mfg. Co.................604
ELECTRIC CABLE.
(See Cables, Electric.)

ELECTRIC DRILLS.
(See Drills, Electric.)

ELECTRIC FANS.
(See Electric Supplies.)

ELECTRIC FUZES.
(See Blasting Supplies.)

ELECTRIC LIGHT PLANTS.
Fairbanks Co., The....229
Sackett Mine Supply Co., The....534

ELECTRIC LOCOMOTIVES.
(See Locomotives, Electric.)

ELECTRIC MINERS' LAMPS.
Concordia Safety Lamp Co., Inc..575
Edison Storage Battery Co....576
General Electric Co....512
Indestructo Mine Lamp Co., Inc...577
Mannesmann Light Co. of America, Inc....578
Mine Safety Appliances Co....590
Witherbee Igniter Co....579

ELECTRIC ROCK DRILLS.
(See Drills, Rock.)

ELECTRIC MINE LAMP BULBS.
Union Electric Co....535

ELECTRIC SUPPLIES.
American Steel & Wire Co....516
Automatic Reclosing Circuit Breaker Co....539
Buettner & Shelburne Machine Co., Inc....504-505
Calebaugh Self-Lubricating Carbon Co....540
Cleveland Armature Works....549
Colonial Supply Co....599-600-601
Crouse-Hinds Co....478
Cutler-Hammer Mfg. Co., The.280-281
D. & W. Fuse Co....517
Daum, A. F....543
Dudley Electric & Machine Co....550
Economy Fuse & Mfg. Co....544
Electric Railway Equipment Co...520
Electric Service Co....551
Electric Service Supplies Co..528-529
Flood City Mfg. Co....522-523
Garton, W. R., Co., The....530
General Electric Co....134
Glow Electric Co., The....372
Goodman Mfg. Co....460-491
Hazard Mfg. Co....518
Iron City Electric Co....531-546
Jamison Rail Bond & Electrical Supply Co....527
Jeffrey Mfg. Co., The....462-463
Johns, H. W.,-Manville Co....166
Kester Electric Co....547
LeValley Vitae Carbon Brush Co.541
McCullough, W. T., Electric Co...532
Miller-Owen Electric Co., Inc....374
Moloney Electric Co....548
Monarch Refillable Fuse Co....545
Morgan-Gardner Electric Co....494
Pittsburgh Carbon Brush Co....542
Post-Glover Electric Co., The....533
Roebling's, John A., Sons Co....519
Sackett Mine Supply Co....534
Scranton Electric Construction Co.502
Standard Railway Supply Co....525
Stromberg-Carlson Telephone Co.538
Union Electric Co....535
Western Electric Co....536-537
Westinghouse Electric & Mfg. Co....135-317-439

ELECTRIC SQUIBS.
(See Blasting Supplies.)

ELECTRIC WELDING.
Pittsburgh Reinforced Brazing & Machine Co....375

ELECTRICAL INSTRUMENTS.
(See Electric Supplies.)

ELECTRICAL REPAIRS.
Cleveland Armature Works....549
Cherry Tree Machine Co....302
Dudley Electric & Machine Co....550
Electric Service Co., Inc., The....551
Glow Electric Co., The....372
Kester Electric Co....547
Miller-Owen Electric Co., Inc....374

ELEVATOR CABS AND ENCLOSURES.
Cross Engineering Co....123
Jeffrey Mfg. Co....100-102
Wright Wire Co....329

ELEVATOR BUCKETS.
(See Buckets, Elevator and Conveyor.)

ELEVATOR CHAIN.
(See Chain Belting.)

ELEVATORS.
Fairmont Mining Machinery Co.94-99
Elmore, G. H....116-117
Jeffrey Mfg. Co....100-102
Link-Belt Co....103
Mashek Engineering Co....143
Montgomery Coal Washing & Mfg. Co....108
Pittsburgh Coal Washer Co...106-107
Roberts & Schaefer Co....109
Stephens-Adamson Mfg. Co...118-119
Tamaqua Mfg. Co....126
Webster Mfg. Co., The....111

ELEVATOR BELTS.
(See Conveyor Belts.)

ELEVATOR BUCKETS.
(See Buckets, Elevator.)

ELEVATING AND CONVEYING MACHINERY.
(See Conveyors.)

ELIMINATORS—Automatic.
Nicholson, W. H., Co....234

ENDLESS ROPE HAULAGE.
(See Haulage, Endless Rope.)

ENGINE ROOM CLOCKS.
American Steam Gauge & Valve Mfg. Co....226
Pease, C. F., Co., The.... 80

ENGINEERING INSTRUMENTS.
Buff & Buff Mfg. Co.... 76
Elliott, B. K., Co.... 78

ENGINEERS—Contracting and Constructing.
Allen & Garcia Co.... 93
Connellsville Mfg. & Mine Supply Co....275-300-301-420
Dravo Contracting Co., The.... 71
Fairmont Mining Machinery Co.94-99
Link-Belt Co....103
Mashek Engineering Co....143
Morrow Mfg. Co., The....105
Ottumwa Box Car Loader Co....137
Pittsburgh Coal Washer Co...106-107
Roberts & Schaefer Co....109
Scottdale Machine & Mfg. Co....110
Webster Mfg. Co....111
Wisconsin Bridge & Iron Co....112

ENGINEERS—Consulting.
Allen & Garcia Co.... 93
Randolph-Means Co.... 81
Stuart, James & Cooke.... 82
Wisconsin Bridge & Iron Co....112

ENGINEERS—Steam.
Mitchell, W. K., & Co., Inc....214
National Valve & Mfg. Co....215

ENGINEERS—Electrical.
Allen & Garcia Co.... 93
Randolph-Means Co.... 81
Stuart, James & Cooke.... 82

ENGINES—Fan.
American Blower Co....267-269
Ball Engine Co....210
Brownell Co., The....188
Connellsville Mfg. & Mine Supply Co....275
Chandler & Taylor Co....189
Houston, Stanwood & Gamble....191
Ridgway Dynamo & Engine Co.212-213

ENGINES—Gas, Gasoline and Oil.
Fairbanks Co., The....229
McCoy-Brandt Machinery Co....373
Standard Scale & Supply Co., The.132
Tranter Mfg. Co....604

ENGINES—Steam (Mfg.)
Allis-Chalmers Mfg. Co....204-205
American Blower Co....267-269
Armstrong Mfg. Co....197
Ball Engine Co....210
Brownell Co., The....188
Chandler & Taylor Co....189
Houston, Stanwood & Gamble....191
Litchfield Foundry & Machine Co.310
Morris Machine Works....434
Ridgway Dynamo & Engine Co212-213
Vulcan Iron Works....312

ENGINES—New and Second Hand.
Foster, L. B., Co....385
Green, L. A....387
Lazarus, M. E., Co., The....388
McCoy-Brandt Machinery Co....373
Miller-Owen Electric Co., Inc....374
The Sackett Mine Supply Co....534
Standard Scale & Supply Co., The.132
Tranter Mfg. Co....604
Winterer, Herman L....376

ENGINE REPAIRS.
Dudley Electric & Machine Co...550
Renton, Wm., Inc....248

EXHAUST HEADS.
Sims Company, The....223

EXPANSION BOLTS.
(See also Electric Supplies.)
Electric Service Supplies Co..528-529
W. T. McCullough Electric Co....532
Union Electric Co....535

EXPANSION JOINTS.
(See Pipe and Fittings.)

EXPLODERS.
(See Blasting Supplies.)

EXPLOSIVES—Black Powder.
Aetna Explosives Co., Inc....558-559
Aetna Explosives Co., Inc....558-559
Atlas Powder Co....560-561
Austin Powder Co....557
Burton Powder Co., The....566
Du Pont, E. I., de Nemours & Co....562-565
Hercules Powder Co....567-568-569
King Powder Co., The....570
United States Powder Co....571

EXPLOSIVES—Permissible.
Aetna Explosives Co., Inc....558-559
Austin Powder Co....557
Burton Powder Co., The....566
Du Pont, E. I., de Nemours & Co....562-563-564-565
Hercules Powder Co....567-568-569
King Powder Co., The....570

EXPLOSIVE SUPPLIES.
(See Blasting Supplies.)

EXTINGUISHERS—Fire.
(See also Mine Supplies.)
Colonial Supply Co....599-600-601
Frick & Lindsay Co....602-603

FANS—Exhaust and Electric.
(See also Electric Supplies.)
Armstrong Mfg. Co....197
Connellsville Mfg. & Mine Supply Co....275
Glow Electric Co., The....372
Jeffrey Mfg. Co., The....272-273-274
Miller-Owen Electric Co., Inc....374
Post-Glover Electric Co., The....533
Sackett Mine Supply Co., The....534

FANS—Mine Ventilating.
Allis-Chalmers Mfg. Co....204-205
American Blower Co....267-269
Connellsville Mfg. & Mine Supply Co....275
Crawford & McCrimmon Co....303
Jeffrey Mfg. Co....272-273-274
Roberts & Schaefer Co....109
Robinson Ventilating Co....276-277
Vulcan Iron Works....278

FAULT FINDERS.
(See Electric Supplies.)

FEED WATER GREASE EXTRACTORS.
American Steam Gauge & Valve Mfg. Co. 226
Brownell Co., The................188

FEED WATER HEATERS.
Harrison Safety Boiler Co........222
Houston, Stanwood & Gamble....191
Platt Iron Works...............435
Sims Co., The...................223

FEED WATER REGULATORS.
American Steam Gauge & Valve Mfg. Co. 226

FEED WATER PURIFIERS.
Permutit Co., The...............217
Pittsburgh Filter Mfg. Co........218
Scaife, Wm. B., & Son Co.........219

FEED WATER TREATMENT—Vegetable.
Sterling Equipment & Supply Co.220

FIBRE.
(See also Electric Supplies.)
Post-Glover Electric Co., The....533
Tracy, Bertrand P..............508

FIELD COILS.
(See Coils, Armature, Field and Magnet.)

FILLERS—Oil.
Gem Mfg. Co....................247

FILTERS—Iron Removal.
Permutit Co.. The...............217
Pittsburgh Filter Mfg. Co........218
Scaife, Wm. B., & Sons Co........219

FILTERS—Oil.
(See Oil Filters.)

FIRE BUCKETS.
Colonial Supply Co......599-600-601
Cordley & Hayes................573

FIRE ESCAPES.
Osborn Machine Co., The.........319

FIRE EXTINGUISHERS.
(See Extinguishers, Fire.)

FIRST AID SUPPLIES.
Frick & Lindsay Co..........602-603
Mine Safety Appliances Co......590
Safety First Supply Co......591-593

FISH PLATES.
(See Track Accessories.)

FITTINGS.
(See Pipe and Fittings.)

FLAGS—Cotton.
Humphrys', R. A., Sons..........610

FLAGS—Railway Signal.
Humphrys', R. A., Sons..........610

FLANGES.
Mitchell, W. K., & Co., Inc........214
National Valve & Mfg. Co........215

FLASH LIGHTS.
(See Electric Supplies.)

FLOOR GRINDERS.
Somers, Fitler & Todd Co........369

FLY WHEELS.
Kanawha Mfg. Co...............104

FLUES.
(See also Mine Supplies.)
Colonial Supply Co......599-600-601

FORGES.
(See Mine Supplies.)

FORGINGS.
American Car & Foundry Co.336-337
Holmes, Robert, & Bros., Inc.....306
McKay, James, Co..............361
Pittsburgh Knife & Forge Co....362
Standard Chain Co.............363
Vogt, Henry, Machine Co., Inc...194

FORGE—Shop Equipment.
(See also Mine Supplies.)
McCoy-Brandt Machinery Co....373
Somers, Fitler & Todd Co.........369

FORKS—Coke.
(See Mine Supplies.)

FRAMES—Coke Oven.
Irwin Foundry & Mine Car Co..348

FRICTION TAPE.
(See Electric Supplies.)

FROGS AND SWITCHES.
Buckeye Rolling Mill Co.........381
Cincinnati Frog & Switch Co., The390
Clinton Switch Co...............391
Elliot Frog & Switch Co.........392
Foster, L. B., Co...............385
Frank, M. K...................386
Green, L. A...................387
Indianapolis Switch & Frog Co., The 393
Irwin Foundry & Mine Car Co...348
Hockensmith Wheel & Mine Car Co., The 342-343
Kanawha Mfg. Co..............104
Kilby Frog & Switch Co.........394
Light Railway Equipment Co....395
Orenstein-Arthur Koppel Co., The.350
Phillips Mine & Mill Supply Co..351
Richardson & Co., Inc...........389
United States Rail Co...........383
Weir Frog Co..................396
Wharton, William, Jr., & Co., Inc.397

FROGS—Trolley.
(See also Line Material.)
Electric Railway Equipment Co..520
Flood City Mfg. Co.........522-523
McCullough, W. T., Electric Co..532
Ohio Brass Co., The............524
Western Electric Co.........536-537

FROGS—Wrecking.
Alexander Car Replacer Mfg. Co., The 485

FUSE—Blasting.
(See also Blasting Supplies.)
Aetna Explosives Co., Inc....558-559
Burton Powder Co., The........566
Du Pont, E. I., de Nemours & Co. 562-563-564-565
Hercules Powder Co.....567-568-569

FUSE BOXES.
Iron City Electric Co...........531
Johns, H. W.,-Manville Co.......166

FUSE CLIPS.
Monarch Refillable Fuse Co.....545

FUSE—Refillable and Renewable.
Daum, A. F...................543
Economy Fuse & Mfg. Co.......544
McCullough, W. T., Electric Co...532
Monarch Refillable Fuse Co......545

FUSES—Electric.
(See also Electric Supplies.)
Daum, A. F...................543
Economy Fuse Mfg. Co..........544
Iron City Electric Co........531-546
John, H. W.,-Manville Co........166
Kester Electric Co.............547
McCullough, W. T., Electric Co..532
Post-Glover Electric Co., The....533
Western Electric Co.........536-537

GALVANOMETERS.
(See also Blasting Supplies.)
Aetna Explosives Co., Inc...558-559
Atlas Powder Co...........560-561
Burton Powder Co., The.........566
Du Pont, E. I., de Nemours & Co. 562-563-564-565
Atlas Powder Co...........560-561

GAS ANALYSIS INSTRUMENTS.
Simonds, G. L., & Co...........203

GAS PRODUCERS.
Wellman-Seaver-Morgan Co., The.313

GAS WATER HEATERS.
Pittsburgh Harness Supply Co...609

GASKETS—Rubber and Asbestos.
Cancos Mfg. Co................236
Durable Mfg. Co...............237
Goodrich, B. F., Co., The........238
Johns, H. W.,-Manville Co........166
Keasbey & Mattison Co..........167
Jenkins Bros. 233
New York Belting & Packing Co.241
New Jersey Car Spring & Rubber Co. 240
Peerless Rubber Mfg. Co........242
Quaker City Rubber Co.........243
Thermoid Rubber Co............320

GATES—Folding.
Wright Wire Co................329

GATES—Coal Bin.
Connellsville Mfg. & Mine Supply Co. 300-301

GATES—Safety.
Osborn Machine Co., The........319
Diamond Machine Co...........308

GAUGE GLASSES.
Durabla Mfg. Co...............237

GAUGES—Indicating and Recording.
American Steam Gauge & Valve Mfg. Co. 226
Ashton Valve Co., The..........227

GAUGE TESTERS.
American Steam Gauge & Valve Mfg. Co. 226
Ashton Valve Co., The..........227

GEAR DRESSING.
Burnet Co., The...............332
Texas Company, The.........330-331

GEARS AND PINIONS.
Buettner & Shelburne Machine Co., Inc. 504-505
Electric Service Supplies Co..528-529
Falk Co., The..................314
Garton, W. R., Co., The..........530
Kanawha Mfg. Co.............104
General Electric Co............521
Goodman Mfg. Co..............491
Nuttall, R. D., Co.............482
Tracy, Bertrand P.............508
Union Electric Co.............535
Stephens-Adamson Mfg. Co..118-119
Tool Steel Gear & Pinion Co., The.483
Tracy, Bertrand P.............508
Van Dorn & Dutton Co., The.....484

GEARS—Herringbone.
Falk Co., The..................314
Kerr Turbine Co...............211

GEARS—Malleable Bronze.
Lawrenceville Bronze Co........605

GENERATOR SETS.
(See Motor Generator Sets.)

GLASSES—Colored for Safety Lamps.
Macbeth-Evans Glass Co........582

GLASSES—Gauge (Metallic.)
Durabla Mfg. Co...............237

GLASSES—Lubricator.
Durabla Mfg. Co...............237

GLASSES—For Safety Lamps.
Macbeth-Evans Glass Co........582

GOGGLES.
Safety First Supply Co......591-593

GONGS.
(See also Electric Supplies.)
Everhart Brass Works, The......315
Iron City Electric Co...........531
McCullough, W. T., Electric Co...532
Union Electric Co..............535

GOVERNOR—Steam or Electric Hoist.
Royer & Zweibel...............318

GRAPHITE PRODUCTS.
Detroit Graphite Co............161
Dixon, Joseph, Crucible Co.......252

GRATE BARS.
Armstrong Mfg. Co.............197
Cherry Tree Machine Co.........302
Houston, Stanwood & Gamble Co.191
Irwin Foundry & Mine Car Co...348
Kanawha Mfg. Co..............104
McClave-Brooks Co. 198
Valley Iron Works..............199
Walsh & Weidner Boiler Co., The.195

GRATES—Dumping, Shaking and Traveling.
Armstrong Mfg. Co............197
Combustion Engineering Corp.200-201
McClave-Brooks Co. 198
Vogt, Henry, Machine Co., Inc...194
Valley Iron Works..............199

GRATES—Stationary.
Combustion Engineering Corp.200-201
GRAVITY PLANE MACHINES.
Fairmont Mining Machinery Co.94-99
Jeffrey Mfg. Co..........100-101-102
GREASE CUPS.
Universal Lubricator Co., The...235
GREASE CUPS—Compressed Air.
Universal Lubricator Co., The...235
GREASE SYSTEMS.
Ottumwa Box Car Loader Co....137
GREASES FOR ALL PURPOSES.
Atlantic Refining Co., The.......250
Burnet Co., The...............332
Cataract Refining & Mfg. Co....251
Dixon, Joseph, Crucible Co......252
Keystone Lubricating Co........253
New York-New Jersey Lubricant Co. 256
Ohio Grease Co., The........254-255
Texas Co., The.............330-331
GRILLE WORK.
Wright Wire Co................329
GRINDERS AND DRILLS.
Gem Mfg. Co..................247
McCoy-Brandt Machinery Co....373
Somers, Fitler & Todd Co.......369
GUARD RAILS.
(See Track Accessories.)
GUARD RAIL CLAMPS.
Cincinnati Frog & Switch Co., The.390
GUARDS—Gears and Machinery.
Electric Service Supplies Co..528-529
Wright Wire Co................329
GUIDES—Chain.
Buettner & Shelburne Machine Co., Inc. 504-505
Prox, Frank, Co...........506-507
Tracy, Bertrand P..............508
GUNITE.
Cement-Gun Co., Inc............ 75
HAMES.
Hoch Hame Co., Inc., The........608
Pittsburgh Harness Supply Co...609
HAMMER DRILLS.
(See Mining Machines, Puncher Type)
HAMMERS—Power.
Buffalo Foundry & Machine Co...367
Fairbanks Co., The.............229
McCoy-Brandt Machinery Co....373
Somers, Fitler & Todd Co........369
HAMMERS—Sledge.
(See Mine Supplies.)
(See Track Tools.)
HAMMERS—Steam.
Buffalo Foundry & Machine Co...367
HAMMERS—Steam, New and Second Hand.
McCoy-Brandt Machinery Co.....373
HANDLES.
(See also Miners' Tools and Supplies.)
Colonial Supply Co......599-600-601
HANGERS—Pulley.
(See also Transmission Machinery.)
Dodge Sales & Engineering Co...245
HANGERS—Trolley.
(See also Line Material.)
Electric Railway Equipment Co..520
Electric Service Supplies Co..528-529
Garton, W. R., Co., The..........530
General Electric Co.............521
Iron City Electric Co...........531
McCullough, W. T., Electric Co..532
Ohio Brass Co., The.............524
Union Electric Co..............535
Westinghouse Electric & Mfg. Co.526
HARDWARE—Heavy.
Beck & Corbitt Iron Co..........598
Colonial Supply Co......599-600-601
Frick & Lindsay Co.........602-603
Iron City Electric Co...........531
HARNESS.
Pittsburgh Harness Supply Co...609
HARPS—Trolley.
(See also Electric Supplies.)
Electric Service Supplies Co..528-529
Garton, W. R., Co., The..........530
Iron City Electric Co...........531
Leetonia Tool Co., The..........615
Ohio Brass Co., The.............524
Post-Glover Electric Co.........533
Sackett Mine Supply Co., The....534
Tracy, Bertrand P..............508
Union Electric Co..............535
Western Electric Co.........536-537
HATCHETS.
(See also Mine and Miners' Tools.)
Leetonia Tool Co., The..........615
HAULAGE—Endless Rope and Chain
Fairmont Mining Machinery Co.. 98
Moon, George C., Co., Inc........326
Scottdale Machine & Mfg. Co....110
Wellman-Seaver-Morgan Co., The.313
HAULAGE ENGINES.
Crawford & McCrimmon Co.....303
Flory, S., Mfg. Co..........304-305
Holmes, Robert, & Bros., Inc.....306
Houston, Stanwood & Gamble Co.191
Lidgerwood Mfg. Co............309
Litchfield Foundry & Machine Co.310
Ottumwa Box Car Loader Co....137
Vulcan Iron Works..............312
Wellman-Seaver-Morgan Co.....313
HAULS—Car.
(See Car Hauls.)
HEAD FRAMES.
(See also Tipples.)
Allen & Garcia Co.............. 93
Fairmont Mining Machinery Co.94-99
Scottdale Machine & Mfg. Co....110
HEADER LINES—Welded.
Mitchell, W. K., & Co., Inc.......214
National Valve & Mfg. Co.......215
HEADLIGHTS—Incandescent and Arc.
Crouse-Hinds Co. 478
Electric Service Supplies Co.528-529
General Electric Co.............479
Iron City Electric Co...........531
Tracy, Bertrand P..............508
Union Electric Co..............535
Western Electric Co.........536-537
HEATING APPARATUS.
American Blower Co........267-269
HEATERS—Cut Out Valve.
Harrison Safety Boiler Co.......222
HEATERS—Feed Water.
(See Feed Water Heaters.)
HEATERS—Hot Water Service.
Pittsburgh Harness Supply Co...609
Platt Iron Works...............435
Sims Co., The..................223
HEATER—Metering.
Harrison Safety Boiler Co.......222
HELMETS—Oxygen.
Draeger Oxygen Apparatus Co...588
Safety First Supply Co......591-593
HITCHINGS—Mine Car.
Colonial Supply Co......599-600-601
Frick & Lindsay Co..........602-603
Hockensmith Wheel & Mine Car Co., The 342-343
McKay, James, Co..............361
Macomber & Whyte Rope Co.....325
Phillips Mine & Mill Supply Co...351
Pittsburgh Knife & Forge Co....362
HOISTS—Air.
Flory, S., Mfg. Co..........304-305
HOISTS—Electric.
Allis-Chalmers Mfg. Co..........299
Cherry Tree Machine Co........302
Connellsville Mfg. & Mine Supply Co. 300-301
Crawford & McCrimmon Co......303
Diamond Machine Co............308
Fairmont Mining Machinery Co.94-99
Flory, S., Mfg. Co............304-305
General Electric Co.............316
Holmes, Robert, & Bros., Inc....306
Lidgerwood Mfg. Co............309
Link-Belt Co. 103
Litchfield Foundry & Machine Co.310
Pittsburgh Coal Washer Co..106-107
Pneumelectric Machine Co., The..311
Sackett Mine Supply Co., The....534
Scottdale Machine & Mfg. Co....110
Vulcan Iron Works.............312
Wellman-Seaver-Morgan Co., The.313
HOISTS—Gasoline.
Standard Scale & Supply Co., The.132
Tranter Mfg. Co................604
HOISTS—Hand.
Flory, S., Mfg. Co...........304-305
Connellsville Mfg. & Mine Supply Co. 300-301
HOISTS—Room and Gathering.
Cherry Tree Machine Co.........302
Connellsville Mfg. & Mine Supply Co. 300-301
Crawford & McCrimmon Co.....303
Diamond Machine Co...........308
Fairmont Mining Machinery Co.94-99
Lidgerwood Mfg. Co............309
Pneumelectric Machine Co.......311
Sackett Mine Supply Co.........534
Scottdale Machine & Mfg. Co....110
HOISTS—Steam.
Allis-Chalmers Mfg. Co.........299
Connellsville Mfg. & Mine Supply Co. 300-301
Crawford & McCrimmon Co......303
Flory, S., Mfg. Co..........304-305
Holmes, Robert, & Bros., Inc.....306
Houston, Stanwood & Gamble Co.191
Lidgerwood Mfg. Co............309
Litchfield Foundry & Machine Co.310
Scottdale Machine & Mfg. Co....110
Vulcan Iron Works..............312
Wellman-Seaver-Morgan Co., The.313
HOISTS—New and Second Hand.
Foster, L. B., Co................385
Frank, M. K...................386
Green, L. A...................387
McCoy-Brandt Machinery Co....373
Miller-Owen Electric Co., Inc....374
Tranter Mfg. Co................604
HOLES—Drilled.
Drake, A. W., Drilling Co........ 65
HOSE—Air, Fire, Steam and Water.
(See also Mine Supplies.)
Cancos Mfg. Co................236
Goodrich, B. F., Co., The.........238
New Jersey Car Spring & Rubber Co. 240
New York Belting & Packing Co.241
Peerless Rubber Mfg. Co........242
Quaker City Rubber Co.........243
Thermoid Rubber Co............320
HOSE COUPLINGS.
(See also Mine Supplies.)
Goodrich, B. F., Co., The.........238
HOSPITAL EQUIPMENT.
Mine Safety Appliances Co......590
Safety First Supply Co......591-593
HOUSES FOR MINERS.
North American Construction Co.168
HYGROMETERS.
Davis Instrument Mfg. Co....... 77
Elliott, B. K., Co................ 78
ICE AND REFRIGERATING MACHINERY.
Vogt, Henry, Machine Co., Inc...194
IGNITERS—Delay Electric.
(See Blasting Supplies.)
INCLINE MACHINERY.
Diamond Machine Co...........308
INDICATORS—Engine.
American Steam Gauge & Valve Mfg. Co. 226
INDICATORS—Rest. (Fan or Cage.)
Royer & Zweibel................318
INSTRUMENT REPAIRING.
Buff & Buff Mfg. Co............. 76
Elliott, .B K., Co................ 78
Heller & Brightly............. 79

INSTRUMENTS—Gas—Analysis.
Simonds, G. L., & Co............203

INSULATED WIRE AND CABLE.
(See also Electric Supplies.)
American Steel & Wire Co.......516
D. & W. Fuse Co...............517
Garton, W. R., Co.............530
Hazard Mfg. Co................518
Iron City Electric Co...........531
Johns, H. W.,-Manville Co.......166
McCullough, W. T., Electric Co...532
Roebling's, John A., Sons Co.....519
Western Electric Co.........536-537

INSULATING — Compounds, Paints and Varnishes.
(See also Electric Supplies.)
Cheesman & Elliott Co..........160
Highland Chemical Products Co..440
Iron City Electric Co...........531
McCullough, W. T., Electric Co...532
Tracy, Bertrand P..............508
Union Electric Co..............535
Post-Glover Electric Co., The....533
Western Electric Co.........536-537

INSULATING BRICK.
Armstrong Cork & Insulation Co.216

INSULATION—Cork Board.
Armstrong Cork & Insulation Co.216

INSULATING—Papers.
General Roofing Mfg. Co........165

INSULATING TAPE AND CLOTH.
(See also Electric Supplies.)
Buettner & Shelburne Machine Co., Inc. 504-505
D. & W. Fuse Co................517
Johns, H. W.,-Manville Co.......166
Western Electric Co.........536-537

INSULATORS—All Types.
(See also Electric Supplies and Trolley Line Materials.)
Electric Service Supplies Co..528-529
Iron City Electric Co...........531
McCullough, W. T., Electric Co...532
Ohio Brass Co., The............524
Sackett Mine Supply Co., The....534
Union Electric Co..............535
Western Electric Co.........536-537

INSURANCE—Accident, Health and Liability.
Provident Life & Casualty Co...596

IRON BARS.
(See also Mine Supplies.)
Beck & Corbitt Iron Co..........598
Colonial Supply Co......599-600-601

JACKS—Mine and Industrial.
(See also Mine & Electrical Supplies)
Colonial Supply Co......599-600-601
Duff Mfg. Co., The..............606
Hardsocg, Martin, Co., The...612-613
Hardsocg Mfg. Co...........612-613
Templeton, Kenly & Co., Ltd....607
Union Electric Co..............535

JACKS—Hydraulic, Ball Bearing, Screw and Automatic Lowering.
Duff Mfg. Co., The..............606
Templeton, Kenly & Co., Ltd....607

JACKS—Locomotive and Mining Machine.
Duff Mfg. Co., The..............606
Templeton, Kenly & Co., Ltd....607

JACKS—Mine Car.
Duff Mfg. Co., The..............606
Templeton, Kenly & Co., Ltd.....607

JIGS.
Fairmont Mining Machinery Co.94-99
Elmore, G. H...............116-117
Link-Belt Co. 103
Montgomery Coal Washing & Mfg. Co. 108
Roberts & Schaefer Co..........109
Pittsburgh Coal Washer Co..106-107
Tamaqua Mfg. Co..............126
Wilmot Engineering Co.........127

JOINTS—Universal.
Gem. Mfg. Co..................247

JOURNAL BOXES.
Tamaqua Mfg. Co..............126

JUNCTION BLOCKS.
Flood City Mfg. Co..........522-523

LAMP ACCESSORIES—Safety.
(See Lamps—Miners' Safety.)

LAMP CHARGING EQUIPMENT.
Concordia Safety Lamp Co., Inc..575
Cutler-Hammer Mfg. Co.....280-281
Edison Storage Battery Co......576
Koehler Mfg. Co................580
Mannesmann Light Co. of America, Inc. 578
Mine Safety Appliances Co......590
Wolf Safety Lamp Co. of America, Inc. 581

LAMP GUARDS.
(See also Electric Supplies.)
Electric Service Supplies Co.528-529
McCullough, W. T., Electric Co..532

LAMPS—Arc and Incandescent.
(See also Electric Supplies.)
Garton, W. R., Co., The..........530
Glow Electric Co., The..........372
Iron City Electric Co............531
Johns, H. W.,-Manville Co.......166
Kester Electric Co.............547
McCullough, W. T., Electric Co...532
Post-Glover Electric Co., The....533
Western Electric Co.........536-537

LAMPS—Carbide.
(See also Mine Supplies and Miners' Tools and Supplies.)
Grier Bros. Co., The............583
Justrite Mfg. Co................584
Leetonia Tool Co., The...........615
Simmons, John Co..............585
Wolf Safety Lamp Co. of America, Inc. 581

LAMPS—Carbide Accessories.
Grier Bros. Co..................583
Justrite Mfg. Co...............584
Simmons, John, Co.............585
Wolf Safety Lamp Co. of America, Inc. 581

LAMPS—Electric, Hand.
Concordia Safety Lamp Co., Inc..575
Mannesmann Light Co. of America, Inc. 578

LAMPS—Electric Safety, Cap (Mfrs.)
Concordia Safety Lamp Co., Inc..575
Edison Storage Battery Co......576
General Electric Co............521
Indestructo Electric Mine Lamp Co., Inc. 577
Mannesmann Light Co. of America, Inc. 581
Wolf Safety Lamp Co. of America, Inc. 881

LAMPS—Electric Trip.
(See also Lamps Electric Safety.)
Concordia Safety Lamp Co., Inc..575
Mannesmann Light Co. of America, Inc. 578
Wolf Safety Lamp Co. of America, Inc. 581

LAMPS—Miners' Safety.
Koehler Mfg. Co................580
Wolf Safety Lamp Co. of America, Inc. 581

LAMPS—Oil.
Leetonia Tool Co., The..........615

LARRIES.
Connellsville Mfg. & Mine Supply Co. 300-301
Dempcy-Degener Co. 129
Montgomery Coal Washing & Mfg. Co. 108
Phillips Mine & Mill Supply Co...128
Scottdale Machine & Mfg. Co....174

LARRY BRASSES.
Lawrenceville Bronze Co.........605

LATCHES—Track.
Clinton Switch Co..............391

LATHES.
McCoy-Brandt Machinery Co....373
Somers, Fitler & Todd Co.......369
Winterer, Herman L............376

LAVATORIES.
Pittsburgh Harness Supply Co...609

LEAD COVERED CABLES.
(See Cables, Lead Encased.)

LEADING AND CONNECTING WIRE.
(See Blasting Supplies.)

LEADING WIRE.
(See Blasting Supplies.)

LEADING WIRE REELS.
(See Blasting Supplies.)

LEATHER—Harness.
(See also Mine Supplies.)
Frick & Lindsay Co.........602-603
Pittsburgh Harness Supply Co...609

LEVELERS—Coke Ovens.
Connellsville Mfg. & Mine Supply Co. 300-301
Scottdale Machine & Mfg. Co....174
Wellman-Seaver-Morgan Co., The.313

LEVELING RODS.
Buff & Buff Mfg. Co............ 76
Heller & Brightly.............. 79
Pease, C. F., Co., The........... 80

LEVELS.
Buff & Buff Mfg. Co............ 76
Davis Instrument & Mfg. Co.... 77
Elliott, B. K., Co................78
Heller & Brightly.............. 79
Pease, C. F., Co., The............ 80

LIGHTNING ARRESTERS.
(See Arresters, Lightning.)

LIGHTING FIXTURES AND SUPPLIES.
(See Electric Supplies.)

LINE MATERIAL.
(See also Electric Supplies.)
American Steel & Wire Co......516
Electric Service Supplies Co..528-529
Electric Railway Equipment Co..520
General Electric Co............521
Garton, W. R., Co., The.........530
Iron City Electric Co............531
Johns, H. W.,-Manville Co.......166
McCullough Electric Co., W. T..532
Ohio Brass Co., The............524
Standard Railway Supply Co....525
Sackett Mine Supply Co., The....534
Post-Glover Electric Co., The....533
Tracy, Bertrand P..............508
Union Electric Co..............535
Western Electric Co.........536-537
Westinghouse Electric & Mfg. Co.526

LOADERS—Box Car.
(See Box Car Loaders.)

LOADERS—Coke Oven.
Connellsville Mfg. & Mine Supply Co. 300-301
Scottdale Machine & Mfg. Co....174
Wellman-Seaver-Morgan Co., The.313

LOADERS—Wagon and Truck.
Jeffrey Mfg. Co., The........100-102
Link-Belt Co. 103

LOADING BOOMS.
Connellsville Mfg. & Mine Supply Co. 300-301
Fairmont Mining Machinery Co.94-99
Holmes, Robert, & Bros., Inc....306
Jeffrey Mfg. Co., The........100-102
Kanawha Mfg. Co..............104
Link-Belt Co. 103
Morrow Mfg. Co., The...........105
Pittsburgh Coal Washer Co...106-107
Roberts & Schaefer Co..........109
Scottdale Machine & Mfg. Co....110
Stephens-Adamson Mfg. Co..118-119
Webster Mfg. Co., The..........111

LOCK NUTS.
(See also Mine Supplies.)
National Tube Co., The......446-455
LOCKS—Miners' Check.
Mines Otolok Check Co., Inc., The.364
LOCOMOTIVE BEARINGS.
Lawrenceville Bronze Co........605
LOCOMOTIVE CABLE.
(See also Wire Rope.)
American Steel & Wire Co.......321
Hazard Mfg. Co................323
Roebling's, John A., Sons Co.....327
LOCOMOTIVE CHARGING EQUIPMENT.
Cutler-Hammer Mfg. Co......280-281
LOCOMOTIVE CRANES.
Link-Belt Co. 103
LOCOMOTIVE HEADLIGHTS.
Crouse-Hinds Co. 478
General Electric Co............479
Electric Service Supplies Co..528-529
LOCOMOTIVES—Electric.
Electric Carrier Co.............465
General Electric Co.............459
Goodman Mfg. Co...............460
Jeffrey Mfg. Co., The........462-463
Light Railway Equipment Co....395
Morgan-Gardner Electric Co.....461
Westinghouse Electric & Mfg. Co.464
LOCOMOTIVES—Electric for Heavy Grades.
Electric Carrier Co.............465
LOCOMOTIVES—Compressed Air.
Porter, H. K., Co................474
Vulcan Iron Works.............475
LOCOMOTIVES—Gasoline.
Milwaukee Locomotive Mfg. Co...476
Vulcan Iron Works..............475
Whitcomb, Geo. D., Co..........477
LOCOMOTIVES—New and Second Hand. All Types.
Foster, L. B., Co...............385
Green, L. A....................387
Lazarus, M. E., Co., The.........388
McCoy-Brandt Machinery Co....373
Miller-Owen Electric Co., Inc.....374
LOCOMOTIVES—Steam.
Porter, H. K., Co...............474
Vulcan Iron Works..............475
LOCOMOTIVES—Storage Battery.
General Electric Co.............459
Goodman Mfg. Co...............460
Ironton Engine Co., The.........466
Jeffrey Mfg. Co.............462-463
Light Railway Equipment Co....395
Mancha Storage Battery Locomotive Co. 467
Morgan-Gardner Electric Co.....461
Westinghouse Electric & Mfg. Co.464
Whitcomb, Geo. D., Co..........468
LOCOMOTIVE WHEELS.
Kenova Mine Car Co.........344-345
Lobdell Car Wheel Co.......346-347
Pennsylvania Casting & Machine Works 473
LUBRICANTS—For All Classes of Inside and Surface Equipment.
Atlantic Refining Co., The.......250
Burnet Co., The.................332
Cataract Refining & Mfg. Co....251
Dixon, Joseph, Crucible Co.......252
Keystone Lubricating Co........253
New York and New Jersey Lubricant Co. 256
Ohio Grease Co., The........254-255
Texas Co., The.............330-331
LUBRICATORS—Grease.
Ohio Grease Co., The........254-255
Universal Lubricator Co.........235
MACHINE BITS.
(See Bits and Picks for Mining Machines.)
MACHINERY—Bought, Sold and Exchanged.
Dudley Electric & Machine Co...550
Electric Service Co.............551
Foster, L. B...................385
Frank, M. K...................386
Glow Electric Co., The..........372
Green, L. A....................387
Kester Electric Co.............547
Lazarus, M. E., Co., The.........388
McCoy-Brandt Machinery Co.....373
Miller-Owen Electric Co., Inc.....374
Winterer, Herman L...........376
MACHINERY—Repaired.
Buettner & Shelburne Machine Co. 504-505
Cherry Tree Machine Co.........302
Dudley Electric & Machine Co...550
Electric Service Co.............551
Glow Electric Co...............372
Holmes, Robert, & Bros., Inc.....306
Kester Electric Co.............547
Miller-Owen Electric Co., Inc.....374
Osborn Machine Co., The........319
Prox, Frank, Co...........506-507
Renton, Wm., Inc..............248
Sackett Mine Supply Co., The....534
Tracy, Bertrand P.............508
Tranter Mfg. Co...............604
MACHINES — Conveying (Pushing and Leveling for Rectangular and By-Product Coke Ovens.)
Connellsville Mfg. & Mine Supply Co. 300-301
Scottdale Machine & Mfg. Co....174
Wellman-Seaver-Morgan Co. 303
MACHINERY—Coal Pier.
(See Bridges, Coal Dock.)
MACHINE TOOLS.
McCoy-Brandt Machinery Co....373
Somers, Fitler & Todd Co........369
Winterer, Herman L...........376
MAGAZINES.
(See Blasting Supplies.)
MAGNET WIRE.
(See Wire, Magnet.)
MAGNETOS—Blasting.
(See Blasting Supplies.)
MANDRELS.
(See also Mine Supplies.)
Nicholson, W. H., & Co..........234
MANILLA ROPE.
(See also Mine Supplies.)
Burnet Co. 332
Colonial Supply Co......599-600-601
Dodge Sales & Engineering Co. 114-115-245-270-271
New York Cordage Co., The......244
MANOMETER.
Davis Instrument Mfg. Co....... 77
MATERIAL—Line.
(See Line Material.)
MATS—Rubber.
(See Mechanical Rubber Goods.)
MATTOCKS.
(See Miners' Tools and Supplies.)
MECHANICAL DRAFT.
American Blower Co.........267-269
Combustion Engineering Corp.200-201
Coppus Engineering & Equipment Co. 202
McClave-Brooks Co. 198
MECHANICAL RUBBER GOODS.
(See also Mine Supplies.)
Cancos Mfg. Co.................236
Durabla Mfg. Co................237
Goodrich, B. F., Co., The.........238
Jenkins Bros. 233
Johns-Pratt Co. 239
New Jersey Car Spring & Rubber Co. 240
New York Belting & Packing Co.241
Peerless Rubber & Mfg. Co......242
Thermoid Rubber Co............320
METAL—Acid Resisting.
Flood City Mfg. Co..........522-523
Lawrenceville Bronze Co.........605
METAL—Babbitt.
(See Babbitt Metal.)
METALS—Asbestos Protected.
Asbestos Protected Metal Co.....164
METAL POLISH.
Cancos Mfg. Co.................236
METALLIC BRUSHES.
Calebaugh Self-Lubricating Carbon Co. 540
METERS—Current.
Buff & Buff Mfg. Co............. 76
MICA AND MICA PRODUCTS.
(See also Electric Supplies.)
Garton, W. R., Co...............530
Johns, H. W.,-Manville Co.......166
Tracy, Bertrand P..............508
Western Electric Co.........536-537
MINE CAR AXLES.
American Car & Foundry Co.336-337
Duncan Foundry & Mach. Works.335
Enterprise Foundry & Machine Co.339
Fulton Pit Car & Mfg. Co....340-341
Gustafson Mfg. Co..............338
Hockensmith Wheel & Mine Car Co. 342-343
Irwin Mine Car & Foundry Co...348
Kanawha Mfg. Co...............349
Kenova Mine Car Co........344-345
Lobdell Car Wheel Co........346-347
Orenstein-Arthur Koppel Co.....350
Phillips Mine & Mill Supply Co..351
Pressed Steel Car Co........352-353
Sanford-Day Iron Works........354
Southern Wheel Co..............355
Star Mfg. Co., The..............356
Walsh & Weidner Boiler Co......195
Watt Mining Car Wheel Co., The.357
Youngstown Steel Car Co........358
MINE CAR CHECK LOCKS.
Mines Otolok Check Co., Inc., The.364
MINE CAR HITCHINGS.
(See Hitchings, Mine Car.)
MINE CAR IRONS.
American Car & Foundry Co.336-337
Duncan Foundry & Machine Works 335
Enterprise Foundry & Machine Co.339
Fulton Pit Car & Mfg. Co., The 340-341
Gustafson Mfg. Co..............338
Hockensmith Wheel & Mine Car Co. 342-343
Irwin Mine Car & Foundry Co..348
Kanawha Mfg. Co...............349
Kenova Mine Car Co.........344-345
McKay, James, Co..............361
Phillips Mine & Mill Supply Co..351
Pittsburgh Knife & Forge Co....362
Sanford-Day Iron Works........354
Southern Wheel Co..............355
Standard Chain Co..............363
Star Mfg. Co...................356
Watt Mining Car Wheel Co......357
Youngstown Steel Car Co........358
MINE CAR OILERS.
(See also Mine Supplies.)
Frick & Lindsay Co..........602-603
Gem Mfg. Co...................247
Gustafson Mfg. Co..............338
Keystone Lubrircarting Co.......253
New York & New Jersey Lubricant Co. 256
MINE CAR TRUCKS.
American Car & Foundry Co..336-337
Cherry Tree Machine Co.........302
Duncan Foundry & Machine Works 335
Enterprise Foundry & Machine Works 339
Fairmont Mining Machinery Co.94-99
Fulton Pit Car & Mfg. Co., The 340-341
Gustafson Mfg. Co..............338
Hockensmith Wheel & Mine Car Co., The 342-343
Irwin Foundry & Mine Car Co...348

(Continued on Next Page)

Kanawha Mfg. Co..............349
Kenova Mine Car Co.........344-345
Orenstein-Arthur Koppel Co., The.350
Phillips Mine & Mill Supply Co..351
Pressed Steel Car Co.........352-353
Sanford-Day Iron Works........354
Southern Wheel Co.............355
Star Mfg. Co., The.............356
Walsh & Weidner Boiler Co.....195
Watt Mining Car Wheel Co., The.357
Youngstown Steel Car Co........358

MINE CAR WHEELS—Plain and Self-Oiling.
American Car & Foundry Co..336-337
Cherry Tree Machine Co.........302
Duncan Foundry & Machine Works 335
Enterprise Foundry & Machine Works 339
Fairmont Mining Machinery Co.94-99
Fulton Pit Car & Mfg. Co., The340-341
Gustafson Mfg. Co.............338
Hockensmith Wheel & Mine Car Co. 342-343
Irwin Foundry & Mine Car Co...348
Kanawha Mfg. Co..............349
Kenova Mine Car Co.........344-345
Lobdell Car Wheel Co........346-347
Orenstein-Arthur Koppel Co., The.350
Phillips Mine & Mill Supply Co..351
Sanford-Day Iron Works........354
Southern Wheel Co.............355
Star Mfg. Co., The.............356
Walsh & Weidner Boiler Co......195
Watt Mining Car Wheel Co., The.357
Wharton, William, Jr., & Co., Inc.397
Youngstown Steel Car Co........358

MINE CAR WHEELS—Roller Bearing.
American Car & Foundry Co.336-337
Duncan Foundry & Machine Works 335
Enterprise Foundry & Machine Works 339
Fulton Pit Car & Mfg. Co., The.340-341
Gustafson Mfg. Co.............338
Hockensmith Wheel & Mine Car Co. 342-343
Irwin Foundry & Mine Car Co...348
Kanawha Mfg. Co..............349
Kenova Mine Car Co.........344-345
Lobdell Car Wheel Co........346-347
Orenstein-Arthur Koppel Co., The.350
Phillips Mine & Mill Supply Co...351
Sanford-Day Iron Works........354
Southern Wheel Co.............355
Star Mfg. Co., The.............356
Watt Mining Car Wheel Co., The.357
Youngstown Steel Car Co........358

MINE CARS—Steel, Wood and Composite.
American Car & Foundry Co.336-337
Cherry Tree Machine Co.........302
Duncan Foundry & Machine Works 335
Enterprise Foundry & Machine Works 339
Fairmont Mining Machinery Co.94-99
Fulton Pit Car & Mfg. Co., The 340-341
Gustafson Mfg. Co.............338
Hockensmith Wheel & Mine Car Co., The 342-343
Irwin Foundry & Mine Car Co...348
Kanawha Mfg. Co..............349
Kenova Mine Car Co........344-345
Montgomery Coal Washing & Mfg. Co. 108
Orenstein-Arthur Koppel Co., The.350
Phillips Mine & Mill Supply Co...351
Pressed Steel Car Co.........352-353
Sanford-Day Iron Works.........354
Southern Wheel Co.............355
Star Mfg. Co., The.............356
Walsh & Weidner Boiler Co., The.195
Watt Mining Car Wheel Co., The..357
Youngstown Steel Car Co.......358

MINE CARS—New and Used.
Frank, M. K....................386
Green, L. A....................387
Miller-Owen Electric Co., Inc.....374
McCoy-Brandt Machinery Co.....373

MINE HANGERS.
(See Hangers, Trolley.)

MINE HARNESS.
Pittsburgh Harness Supply Co....609

MINE RESCUE EQUIPMENT.
Draeger Oxygen Apparatus Co...588
Mine Safety Appliances Co......590

MINE SHAFT SAFETY GATES.
Diamond Machine Co...........308
Connellsville Mfg. & Mine Supply Co. 300-301
Osborn Machine Co., The........319

MINE SUPPLIES.
Beck & Corbitt Iron Co..........598
Boyts, Porter & Co..........415-417
Cancos Mfg. Co.................236
Cherry Tree Machine Co........302
Colonial Supply Co......599-600-601
Dodge Sales & Engineering Co..245
Electric Service Supplies Co..528-529
Fairbanks Co., The..........130-229
Fairmont Mining Machinery Co.94-99
Flood City Mfg. Co..........522-523
Frick & Lindsay Co..........602-603
Fulton Tool Co................614
Garton, W. R., Co..............530
Green, L. A....................387
Hardsocg, Martin, Co., The......612
Hardsocg Mfg. Co..............613
Iron City Electric Co...........546
Johns, H. W.,-Manville Co........166
Johnston, Morehouse & Dickey...286
Kester Electric Co.............547
Leetonia Tool Co., The..........615
McCoy-Brandt Machinery Co.....373
Osborn Machine Co., The.........319
Reineke-Wagner Pump Supply Co.437
Sackett Mine Supply Co..........534
Somers, Fitler & Todd Co.......369
Tracy, Bertrand P..............508
Tranter Mfg. Co................604
Union Electric Co..............535
Warwood Tool Co...............617
Western Electric Co.........536-537
Winterer, Herman L............376

MINE TELEPHONES.
(See also Electric Supplies.)
Electric Service Supplies Co..528-529
Iron City Electric Co...........531
Mine Safety Appliances Co......590
Stromberg-Carlson Telephone Mfg. Co. 538
Western Electric Co.........536-537

MINERS' BATH HOUSES.
Roberts & Schaefer Co..........109

MINERS' HOUSES.
North American Construction Co.168

MINERS' CAPS.
(See Miners' Tools and Supplies.)

MINERS' DRILLS.
Fulton Tool Co.................614
Hardsocg, Martin, Co., The...612-613
Hardsocg Mfg. Co...........612-613
Howells Mining Drill Co.........500
Leetonia Tool Co., The...........615
Nixon Mining Drill Co..........616
Warwood Tool Co...............617

MINERS' TOOLS AND SUPPLIES.
Frick & Lindsay Co..........602-603
Fulton Tool Co., The............614
Grier Bros. Co., The............583
Hardsocg, Martin, Co., The...612-613
Hardsocg Mfg. Co...........612-613
Howells Mining Drill Co.........500
Leetonia Tool Co., The..........615
Nixon Mining Drill Co..........616
Warwood Tool Co...............617

MINERS' WAX.
Atlantic Refining Co............250
Texas Co., The.............330-331

MINING MACHINE BITS.
(See Bits and Picks for Mining Machines.)

MINING MACHINES—Breast Type.
Goodman Mfg. Co...............491
Jeffrey Mfg. Co., The........492-493
Morgan-Gardner Electric Co.....494
Sullivan Machinery Co..........495

MINING MACHINE CABLE.
(See Cables for Mining Machines.)

MINING MACHINES—Longwall and Shortwall.
Goodman Mfg. Co..............491
Jeffrey Mfg. Co.................493
Morgan-Gardner Electric Co.....494
Prox, Frank, Co............506-507
Sullivan Machinery Co..........495

MINING MACHINES—Over-cutting Type.
Goodman Mfg. Co...............491
Jeffrey Mfg. Co., The...........493
Morgan-Gardner Electric Co.....494
Sullivan Machinery Co..........495

MINING MACHINES—Puncher Type
Ingersoll-Rand Co. 496
Pneumeletric Machine Co........497
Sullivan Machinery Co..........495

MINING MACHINES—Power Drills.
Fairmont Mining Machinery Co..498
General Electric Co............499
Howells Mining Drill Co.........500
Ingersoll-Rand Co. 496
Jeffrey Mfg. Co., The........492-493
Nixon Mining Drill Co...........616
Pneumeletric Machine Co., The...501
Scranton Electric Construction Co.502
Sullivan Machinery Co...........495

MINING MACHINE PARTS AND REPAIRS.
Buettner & Shelburne Machine Co., Inc. 504-505
Cherry Tree Machine Co.........302
Electric Service Co., The.........551
Flood City Mfg. Co..........522-523
Glow Electric Co., The...........372
Prox, Frank, Co.............506-507
Tracy, Bertrand P..............508

MINING MACHINES—New and Second Hand.
Frank, M. K....................386
Glow Electric Co...............372
Green, L. A....................387
McCoy-Brandt Machinery Co.....373
Miller-Owen Electric Co., Inc....374

MINING PLANTS DESIGNED AND CONSTRUCTED.
Allen & Garcia Co............. 93
Dravo Constructing Co., The..... 71
Elmore, G. S................116-117
Fairmont Mining Machinery Co.94-99
Kanawha Mfg. Co...............104
Link-Belt Co. 103
Montgomery Coal Washing & Mfg. Co. 108
Morrow Mfg. Co., The...........105
Ottumwa Box Car Loader Co.....137
Pittsburgh Coal Washer Co...106-107
Roberts & Schaefer Co...........109
Scottdale Machine & Mfg. Co....110
Webster Mfg. Co................111
Wilmot Engineering Co..........127
Wisconsin Bridge & Iron Co.....112

MIXERS—Briquetting.
Mashek Engineering Co..........143

MONITORS.
Gustafson Mfg. Co..............338
Kanawha Mfg. Co...............349
Montgomery Coal Washing & Mfg. Co. 108
Sanford-Day Iron Works.........354
Scottdale Machine & Mfg. Co....110

MOTOR GENERATOR SETS.
Allis-Chalmers Mfg. Co......204-205
General Electric Co.............207
Ridgway Dynamo & Engine Co.212-213

MOTORS, GENERATORS AND DYNAMOS—New and Rebuilt.
Cherry Tree Machine Co.........302
Cleveland Armature Works......549
Dudley Electric & Machine Co....550
Glow Electric Co., The..........372
Electric Service Co.............551
Green, L. A...................387
Iron City Electric Co...........531
Kester Electric Co.............547
Lazarus, M. E., Co., The.........388
McCoy-Brandt Machinery Co.....373
Miller-Owen Electric Co., Inc.....374
Sackett Mine Supply Co., The....534
Tranter Mfg. Co...............604
MOTORS—For Driving all Classes of Inside and Surface Equipment.
Allis-Chalmers Mfg. Co......204-205
General Electric Co..134-438-282-316
Kester Electric Co.............547
Western Electric Co.........536-537
Westinghouse Electric & Mfg. Co. 135-208-209-317-439
MOTOR STARTERS.
Cutler-Hammer Mfg. Co., The.280-281
Iron City Electric Co............546
McCoy-Brandt Machinery Co....373
NAIL PULLERS.
(See also Miners' Tools and Supplies.)
Warwood Tool Co...............617
NEEDLES—Tamping.
Fulton Tool Co..................614
Hardsocg, Martin, Co., The......612
Hardsocg Mfg. Co...............613
Leetonia Tool Co., The..........615
Warwood Tool Co...............617
NON-CORROSIVE COATING.
Highland Chemical Products Co..440
NUTS AND BOLTS.
Beck & Corbitt Iron Co..........598
Buckeye Rolling Mill Co.........381
Colonial Supply Co.......599-600-601
Foster, L. B., Co................385
Frank, M. K....................386
Graham Nut Co.................360
Green, L. A....................387
Tracy, Bertrand P...............508
NUTS—Cold Punched.
Graham Nut Company...........360
OIL—Cylinder, Engine, &c.
(See Lubricants for all Purposes.)
OILERS—Hand.
Gem Mfg. Co....................247
Tracy, Bertrand P...............508
OILERS—Pit Car.
Gem Mfg. Co...................247
Gustafson Mfg. Co..............338
New York and New Jersey Lubricant Co. 256
OIL SEPARATORS.
Harrison Safety Boiler Co........222
Sims Co., The...................223
OVERWINDING DEVICES.
Litchfield Foundry & Machine Co.310
Royer & Zweibel................318
OXY-ACETYLENE — Cutting and Welding Apparatus.
Beck & Corbitt Iron Co..........598
Imperial Brass Mfg. Co..........368
OXY-ACETYLENE WELDING—Field or Shop.
Osborn Machine Co., The.........319
Pittsburgh Reinforced Brazing & Machine Co. 375
OXYGEN HELMETS.
Draeger Oxygen Apparatus Co...588
Mine Safety Appliance Co........590
Safety First Supply Co......591-593
OXYGEN TANKS.
National Tube Co., The.......446-455
QUENCHERS—Coke Oven.
Connellsville Mfg. & Mine Supply Co. 300-301
Scottdale Machine & Mfg. Co.....174
Wellman-Seaver-Morgan Co., The.313

POCKETS—Pocket, First Aid.
Safety First Supply Co.......591-593
PACKING—Asbestos.
(See also Mine Supplies.)
Cancos Mfg. Co................236
Durabla Mfg. Co................237
Johns, H. W.,-Manville Co........166
Johns-Pratt Co., The............239
Keasbey & Mattison Co..........167
PACKING—Hydraulic and Steam.
(See also Mine Supplies.)
Cancos Mfg. Co................236
Durabla Mfg. Co................237
Goodrich, B. F., Tire & Rubber Co.238
Jenkins Bros. 233
Johns, H. W.,-Manville Co.......166
Johns-Pratt Co. 239
New Jersey Car Spring & Rubber Co. 240
New York Belting & Packing Co..241
Peerless Rubber Mfg. Co.........242
Quaker City Rubber Co..........243
PACKING—Rubber.
(See also Mine Supplies.)
Cancos Mfg. Co................236
Goodrich, B. F., Co., The.........238
New Jersey Car Spring & Rubber Co. 240
New York Belting & Packing Co.241
Peerless Rubber Mfg. Co.........242
Quaker City Rubber Co..........243
Thermoid Rubber Co............320
PAILS—Fire.
Cordley & Hays.................573
PAILS—Insulated.
Cordley & Hays.................573
PAINTS—For Metal and Wood Surfaces.
(See also Mine Supplies.)
Barrett Manufacturing Co.......156
Cabot, Samuel, Inc.............157
Cheesman & Elliott.............160
Detroit Graphite Co............161
Dixon, Joseph, Crucible Co.......252
General Roofing Mfg. Co........165
Highland Chemical Products Co.440
Johns, H. W.,-Manville Co........166
National Roofing Co., The....162-163
PAINTS FOR BRICK, CEMENT AND CONCRETE.
Cheesman & Elliot..............160
National Roofing Co., The....162-163
Detroit Graphite Co............161
PAINT—Insulating.
(See Insulating Compounds, Paints and Varnishes.)
PANS—Elevator.
(See Elevating and Conveying Machinery.)
PANEL BOARDS.
(See Switch Boards.)
PAPERS—Tracing and Detail.
(See Drawing Materials.)
PAPERS—Profile and Cross-Section.
(See Drawing Materials.)
PERFORATED SHEETS—"U" Dent.
Remaly Mfg. Co.................125
PERMISSIBLE EXPLOSIVES.
(See Explosives, Permissible.)
PICKING TABLES.
(See also Tipple Equipment.)
Allen & Garcia Co............... 93
Cross Engineering Co...........123
Dodge Sales & Engineering Co.114-115
Fairmont Mining Machinery Co.94-99
Jeffrey Mfg. Co., The........100-102
Link-Belt Co. 103
Morrow Mfg. Co., The...........105
Pittsburgh Coal Washer Co...106-107
Roberts & Schaefer Co..........109
Scottdale Machine & Mfg. Co.....110
Tamaqua Mfg. Co...............126
Webster Mfg. Co., The...........111

PICKS—Coal.
(See Miners' Tools and Supplies.)
PICKS—Mining Machine.
(See Bits and Picks for Mining Machines.)
PILLOW BLOCKS—Pulleys.
Dodge Sales & Engineering Co...245
PINIONS.
(See Gears and Pinions.)
PINS.
(See Electric Supplies.)
CAST IRON PIPE AND FITTINGS.
American Car & Foundry Co..336-337
American Cast Iron Pipe Co..442-443
Clow, James B., & Sons......442-443
Donaldson Iron Co...........442-443
Glamorgan Pipe & Foundry Co. 442-443
Hockensmith Wheel & Mine Car Co., The 342-343
Lynchburg Foundry Co......442-443
Massillon Iron & Steel Co....442-443
Standard Cast Iron Pipe & Foundry Co. 442-443
U. S. Cast Iron Pipe & Foundry Co. 442-443
PIPE COATING.
Cheesman & Elliott.............160
Detroit Graphite Co.............161
Highland Chemical Products Co..440
National Tube Co., The.......446-455
PIPE BENDS.
Mitchell, W. K., & Co., Inc.......214
National Valve & Mfg. Co.......215
PIPING CONTRACTORS.
Mitchell, W. K., & Co., Inc.......214
National Valve & Mfg. Co.......215
PIPE COUPLINGS.
(See also Mine Supplies.)
Byers, A. M., Co................441
National Tube Co., The......446-455
PIPE CUTTING AND THREADING MACHINES.
Toledo Pipe Threading Machine Co., The 370
PIPE COVERINGS.
(See also Mine Supplies.)
Armstrong Cork & Insulation Co.216
Johns, H. W.,-Manville Co........166
Keasbey & Mattison Co..........167
Michigan Pipe Co...............444
Standard Wood Pipe Co..........445
PIPE AND FITTINGS.
(See also Mine Supplies.)
Beck & Corbitt Iron Co..........598
Colonial Supply Co.......599-600-601
Homestead Valve Mfg. Co........232
Mitchell, W. K., & Co., Inc.......214
National Tube Co., The......446-455
National Valve & Mfg. Co.......215
Reineke-Wagner Pump & Supply Co. 437
Tranter Mfg. Co...............604
Walsh & Weidner Boiler Co......195
PIPE—Galvanized.
Byers, A. M., Co.................441
National Tube Co., The......446-455
PIPE—Steel.
National Tube Co., The......446-455
PIPE—Wood.
Michigan Pipe Co., The..........444
Standard Wood Pipe Co..........445
PIPE—Wrought Iron.
Byers, A. M., Co................441
Colonial Supply Co......599-600-601
PIPE TONGS.
Leetonia Tool Co................615
PIPE MACHINES.
McCoy-Brandt Machinery Co.....373
Somers, Fitler & Todd Co........369
PIPE VISES.
Toledo Pipe Threading Machine Co., The 370

PIPE—New and Second Hand.
Foster, L. B., Co. 385
Green, L. A. 387
Lazarus, M. E., Co., The 388

PIT CARS.
(See Mine Cars.)

PITOT TUBE.
Davis Instrument Mfg. Co. 77

PLANERS—Wood and Metal.
McCoy-Brandt Machinery Co. 373
Somers, Fitler & Todd Co. 369
Winterer, Herman L. 376

PLANTS FOR BRIQUETTING.
Malcolmson Engineering Co. 142
Mashek Engineering Co. 143

PLATE—Shaker.
Remaly Mfg. Co., Inc. 125

PLATES AND SHEETS.
Beck & Corbitt Iron Co. 598
Cross Engineering Co. 123
Fairmont Mining Machinery Co. 94-99
Holmes, Robert, & Bros., Inc. 306
Platt Iron Works 435
Remaly Mfg. Co. 125

PLUMB BOBS.
Buff & Buff Mfg. Co. 76
Davis Instrument Mfg. Co., Inc. 77
Elliott, B. K., Co. 78
Heller & Brightly 79
Pease, C. F., Co. 80

PLUMBING FIXTURES.
Pittsburgh Harness Supply Co. 609

PLUMMET LAMPS.
Buff & Buff Mfg. Co. 76

POLES—Trolley.
Electric Service Supplies Co. 528-529
Flood City Electric Co. 522-523
Garton, W. R., Co. 530
Iron City Electric Co. 531
National Tube Co., The 446-455
Tracy, Bertrand P. 508
Western Electric Co. 536-537

PORTABLE ELECTRIC TOOLS.
Somers, Fitler & Todd Co. 369

PORTABLE TRACK.
(See Track, Portable.)

PORTLAND CEMENT.
Lehigh Portland Cement Co. 169

POST HOLE DIGGERS.
Warwood Tool Company 617

POWDER—Permissible and Black.
(See Explosives.)

POWDER FLASK—For Miners.
Cordley & Hayes 573

POWER HACK SAWS.
Somers, Fitler & Todd Co. 369

POWER HAMMERS.
Buffalo Foundry & Machine Co. 367
Somers, Fitler & Todd Co. 369

PRESERVATIVES—Belt.
Cling-Surface Co. 246

PRESERVATIVES—Cable.
Burnet Co., The 332

PRESERVATIVE—Rope.
Cling-Surface Co. 246

PRESERVATIVES—Wood.
Barrett Co., The 156
Wood, C. A., Preserver Co., Inc. 158
Detroit Graphite Co. 161
Northeastern Co., The 159

PRESSES—Briquetting.
Malcolmson Briquet Engineering Co. 142
Mashek Engineering Co. 143

PRESSES—Drill.
Gem Mfg. Co. 247
McCoy-Brandt Machinery Co. 373
Somers, Fitler & Tod Co. 369
Winterer, Herman L. 376

PROSPECTING.
Drake, A. W., Drilling Co. 65
Hoffman Bros. 66
Johannessen, J., & Son 67
Punxsutawney Drilling & Contracting Co. 68
Richards, J. R. 69
Sullivan Machinery Co. 70

PULLERS—Coke.
(See also Miners' Tools and Supplies.)
Hardsocg Mfg. Co. 612-613
Hardsocg, Martin, Co., The 612-613

PULLEYS—Magnetic Separating.
Cutler-Hammer Mfg. Co., The 280-281

PULLEYS—Iron, Wood and Steel.
(See also Transmission Machinery.)
(See also Mine Supplies.)
Dodge Sales & Engineering Co. 245
McCoy-Brandt Machinery Co. 373
Stephens-Adamson Mfg. Co. 118-119
Tamaqua Mfg. Co. 126
Tranter Mfg. Co. 604
Webster Mfg. Co., The 111
Winterer, Herman L. 376

PULLEY CLUTCHES, COUPLINGS, COLLARS, HANGERS AND PILLOW BLOCKS.
Dodge Sales & Engineering Co. 245

PULVERIZERS.
(See Crushers, Coal and Coke.)

PUMPS—Boiler Feed.
Allis-Chalmers Mfg. Co. 204-205-411
Aldrich Pump Co. 412-413
American Steam Pump Co. 414
Boyts, Porter & Co. 415-417
Cameron, A. S., Steam Pump Works 418-419
Connellsville Mfg. & Mine Supply Co. 420
Crawford & McCrimmon Co. 303
De Laval Steam Turbine Co. 428
Deming Co., The 422-427
Epping-Carpenter Pump Co. 430
Fairmont Mining Machinery Co. 431
Goulds Mfg. Co. 432
Kerr Turbine Co. 211
Morris Machine Works 434
Platt Iron Works 435
Reineke-Wagner Pump & Supply Co. 437

PUMPS—Deep Well.
Deming Co., The 422-427
Goulds Mfg. Co. 432

PUMPS—Gathering or Dip.
Aldrich Pump Co., The 412-413
American Steam Pump Co. 414
Boyts, Porter & Co. 415-417
Deming Co., The 422-427
Epping-Carpenter Pump Co. 430
Fairmont Mining Machinery Co. 431
Goulds Mfg. Co. 432
Platt Iron Works 435
Pneumelectric Machine Co., The 436

PUMPS—Centrifugal, Turbine and Volute.
Allis-Chalmers Mfg. Co. 411
Cameron, A. S., Steam Pump Works 418-419
Dayton Turbine Pump Co., The 421
De Laval Steam Turbine Co. 428
Elmore, G. H. 429
Epping-Carpenter Pump Co. 430
Goulds Mfg. Co. 432
Kerr Turbine Co. 211
Kingsford Foundry & Machine Works 433
Morris Machine Works 434
Platt Iron Works 435
Reineke-Wagner Pump Supply Co. 437

PUMPS—Piston Type.
American Steam Pump Co. 414
Aldrich Pump Co., The 412-413
Boyts, Porter & Co. 415-417
Cameron, A. S., Steam Pump Works 418-419
Connellsville Mfg. & Mine Supply Co. 420
Crawford & McCrimmon 303
Deming Co., The 422-427
Epping-Carpenter Pump Co. 430
Goulds Mfg. Co. 432
Platt Iron Works 435
Reineke-Wagner Pump & Supply Co. 437

PUMPS—Plunger Type.
American Steam Pump Co. 414
Boyts, Porter & Co. 415-417
Crawford & McCrimmon 303
Cameron, A. S., Steam Pump Works 418-419
Connellsville Mfg. & Mine Supply Co. 420
Deming Co., The 422-427
Epping-Carpenter Pump Co. 430
Goulds Mfg. Co. 432
Platt Iron Works 435
Reineke-Wagner Pump & Supply Co 437

PUMPS—Power.
Aldrich Pump Co., The 412-413
Allis-Chalmers Mfg. Co. 411
American Steam Pump Co. 414
Boyts, Porter & Co. 415-417
Cameron, A. S., Steam Pump Works 418-419
Connellsville Mfg. & Mine Supply Co. 420
Crawford & McCrimmon Co. 303
Deming Co., The 422-427
Epping-Carpenter Pump Co. 430
Goulds Mfg. Co. 432
Kingsford Foundry & Machine Co. 433
Morris Machine Works 434
Platt Iron Works 435
Reineke-Wagner Pump & Supply Co. 437

PUMPS—Hand.
Deming Co., The 422-427
Goulds Mfg. Co. 432
Reineke-Wagner Pump & Supply Co. 437

PUMPS—Steam.
Aldrich Pump Co., The 412-413
American Steam Pump Co. 414
Boyts, Porter & Co. 415-417
Cameron, A. S., Steam Pump Works 418-419
Connellsville Mfg. & Mine Supply Co. 420
Deming Co., The 422-427
Epping-Carpenter Pump Co. 430
Goulds Mfg. Co. 432
Platt Iron Works 435
Reineke-Wagner Pump & Supply Co. 437

PUMPS—Vacuum.
Aldrich Pump Co., The 412-413
Goulds Mfg. Co. 432
Ingersoll-Rand Co. 221

PUMP SINKING.
Goulds Mfg. Co. 432
Deming Co., The 422-427

PUMPS—Acid Resisting.
Allis-Chalmers Mfg. Co. 411
Connellsville Mfg. & Mine Supply Co. 420
Elmore, G. H. 429

PUMPS—New and Second Hand.
Fairbanks Co., The 229
Foster, L. B., Co. 385
Green, L. A. 387
Kester Electric Co. 547
Lazarus, M. E., Co., The 388
McCoy-Brandt Machinery Co. 373
Miller-Owen Electric Co. 374
Standard Scale & Supply Co., The 132
Tranter Mfg. Co. 604
Winterer, Herman L. 376

PUMP GOVERNORS.
Foster Engineering Co..........230
PUMP PLUNGERS—Chilled Iron.
Lobdell Car Wheel Co........346-347
PUMP RODS—Acid Resisting.
Lawrenceville Bronze Co.........605
PUMP ROOM DRIVING.
Ferranti Contracting Co., Inc., The. 72
PUNCHES.
McCoy-Brandt Machinery Co.....373
Somers, Fitler & Todd Co........369
PUNCHER MACHINES.
Ingersoll-Rand Co. 496
Pneumelectric Machine Co.......497
Sullivan Machinery Co..........495
PUNCHER PICKS.
(See also Mine Supplies.)
Fulton Tool Co., The...........614
Hardsocg Mfg. Co...........612-613
Hardsocg, Martin, Co., The...612-613
Leetonia Tool Co................615
McKay, James, Co...............361
Pittsburgh Knife & Forge Co....362
Warwood Tool Co..............617
PUSHERS—Coke Oven.
Connellsville Mfg. & Mine Supply Co. 300-301
Scottdale Machine & Mfg. Co....174
Wellman-Seaver-Morgan Co., The.313
RAIL BENDERS.
(See also Mine Supplies.)
Colonial Supply Co......599-600-601
Foster, L. B., Co................385
Frank, M. K....................386
Frick & Lindsay Co.........602-603
Green, L. A....................387
Hardsocg Mfg. Co...........612-613
Fulton Tool Co.................614
Hardsocg, Martin, Co., The...612-613
Leetonia Tool Co., The..........615
Warwood Tool Co...............617
RAIL BONDS.
American Steel & Wire Co......516
Electric Service Supplies Co..528-529
General Electric Co.............521
Jamison Rail Bond & Electrical Supply Co. 527
Johns, H. W.,-Manville Co.......166
Ohio Brass Co., The.............524
Tracy, Bertrand P..............508
Union Electric Co...............535
Western Electric Co.........536-537
Westinghouse Electric & Mfg. Co.526
RAIL BONDS—Bushing Type.
Jamison Rail Bond & Electrical Supply Co. 527
RAIL BRACES.
(See also Track Accessories.)
Cincinnati Frog & Switch Co., The.390
Indianapolis Switch & Frog Co., The 393
Kilby Frog & Switch Co.........394
RAIL FASTENINGS.
(See Track Accessories.)
RAIL FORKS.
(See Track Accessories.)
RAIL JOINTS.
(See Track Accessories.)
RAIL SPLICES.
(See Track Accessories.)
RAIL TONGS.
(See Track Accessories.)
RAILINGS.
Wright Wire Co.................329
RAILS.
Beck & Corbitt Iron Co..........598
Buckeye Rolling Mill Co.........381
Cambria Steel Co................400
Frank, M. K....................386
Green, L. A....................387
Lazarus, M. E., Co.............388
Light Railway Equipment Co.....395
Orenstein-Arthur Koppel Co., The.350
Richardson & Co., Inc...........389
Sweet's Steel Co................382
United States Rail Co...........383
West Virginia Rail Co., The......384
RAILS—Cut.
(See also Rails.)
Richardson & Co., Inc...........389
RAILS—Relaying.
Buckeye Rolling Mill Co.........381
Foster, L. B., Co................385
Frank, M. K....................386
Green, L. A....................387
Lazarus, M. E., Co., The.........388
Light Railway Equipment Co.....395
RAIL MANUFACTURERS.
Buckeye Rolling Mills Co........381
United States Rail Co...........383
Sweet's Steel Co................382
Cambria Steel Co...............400
West Virginia Rail Co...........384
Richardson & Co., Inc..........389
RAILWAYS—Electric, Industrial.
Light Railway Equipment Co.....395
Orenstein-Arthur Koppel Co.....350
RAILWAYS—Portable.
Light Railway Equipment Co.....395
Orenstein-Arthur Koppel Co.....350
RANGE POLES.
Buff & Buff Mfg. Co............ 76
REBORING CYLINDER—Field or Shop.
Osborn Machine Co., The.........319
Renton, Wm., Inc...............248
REBORING—Valve Seats, Fly Wheels, Gear Wheels, &c.
Renton, Wm., Inc................248
Osborn Machine Co..............319
RECEIVERS—Cut-out Valve.
Harrison Safety Boiler Works....222
RECORDING GAUGES.
Mine Safety Appliances Co.......590
RECORDING INSTRUMENTS.
American Steam Gauge & Valve Mfg. Co. 226
Ashton Valve Co., The...........227
REDUCERS.
(See Pipe and Fittings.)
REFILLABLE FUSES.
Daum, A. F.....................543
Economy Fuse & Mfg. Co.......544
McCullough, W. T., Electric Co...532
Monarch Refillable Fuse Co......545
REFRIGERATORS.
Howe Scale Co., The............131
REGULATORS—Air, Steam and Water.
American Steam Gauge & Valve Mfg. Co. 226
Ashton Valve Co................227
Boyleston Steam Specialty Co....228
Foster Engineering Co..........230
REGULATORS—Fan Engine.
Foster Engineering Co..........230
REPAIR PARTS FOR MINING MACHINES.
(See also Mining Machine Repair Parts.)
Buettner & Shelburne Machine Co., Inc. 504-505
Flood City Mfg. Co..........522-523
Lawrenceville Bronze Co........605
Prox, Frank, Co............506-507
Tracy, Bertrand P.............508
REPAIRING AND REBUILDING ELECTRICAL MACHINERY.
Dudley Electric & Machine Co...550
Electric Service Co.............551
Miller-Owen Electric Co., Inc.....374
REPLACERS—Car and Locomotive.
Alexander Car Replacer Mfg. Co., The 485
RESCREENING PLANTS.
(See also Coal Preparation.)
Fairmont Mining Machinery Co.94-99
Jeffrey Mfg. Co.........100-101-102
Link-Belt Co. 103
Roberts & Schaefer Co..........109
Robins Conveying Belt Co.......122
Webster Mfg. Co................111
Wisconsin Bridge & Iron Co......112
RESCUE APPARATUS.
Draeger Oxygen Apparatus Co., The 588
Life Saving Devices Co..........589
Mine Safety Appliances Co......590
RESUSCITATING APPARATUS.
Draeger Oxygen Apparatus Co., The 588
Life Saving Devices Co..........589
Mine Safety Appliances Co......590
RETARDING CONVEYORS.
(See Conveyors, Retarding.)
RHEOSTATS.
(See also Electric Supplies.)
Buettner & Shelburne Machine Co., Inc. 504-505
Iron City Electric Co...........531
Miller-Owen Electric Co., Inc.....374
Tracy, Bertrand P..............508
Western Electric Co........536-537
RHEOSTATS—Blasting Machine.
(See Blasting Supplies.)
RIDDLES—Foundry.
Wright Wire Co.................329
RIGS—Air Drilling (Portable.)
Sullivan Machinery Co.......... 70
RINGS—Mica.
(See Electric Supplies.)
RIVETS.
(See also Mine Supplies.)
Beck & Corbitt Iron Co..........598
Graham Nut Co................360
Walsh & Weidner Boiler Co......195
RIVETLESS CHAIN.
Cross Engineering Co...........123
Jeffrey Mfg. Co.........100-101-102
Link-Belt Co. 279
Tamaqua Mfg. Co...............126
Wilmot Engineering Co..........127
ROCK DRILLS.
(See Drills, Rock.)
ROCK WORK AND EXCAVATION.
Dravo Contracting Co........... 71
Ferranti Contracting Co., Inc., The 72
Hyde, W. H.................... 73
Patterson, W. F................ 74
ROLLERS.
(See also Mine Supplies.)
Gustafson Mfg. Co..............338
Kanawha Mfg. Co...............104
Sanford-Day Iron Works.........354
Main Belting Co................121
ROLLS AND TEETH FOR CRUSHERS.
(See Crusher Rolls.)
ROOFING.
Asbestos Protected Metal Co.....164
Barrett Company, The...........156
Beck & Corbitt Iron Co..........598
Colonial Supply Co......599-600-601
Frick & Lindsay Co.........602-603
General Roofing Mfg. Co.........165
Humphrey's, R. A., Sons.........610
Johns, H. W.,-Manville Co.......166
Keasbey & Mattison Co..........167
National Roofing Co., The....162-163
Texas Co., The.............330-331
ROOFING—Asbestos, Asphalt and Rubber.
Johns, H. W.,-Manville Co.......166
Keasbey & Mattison Co..........167
General Roofing Mfg. Co.........165
National Roofing Co., The...162-163
ROOFING—Metal.
Asbestos Protected Metal Co.....164
Beck & Corbitt Iron Co...........598

ROOF TRUSSES—Steel.
(See Structural Material.)

ROPE AND CORDAGE.
Colonial Supply Co..........599-601
Macomber & Whyte Rope Co....325
New York Cordage Co., The.....244
Waterbury Co. 328

ROPE DRIVES FOR VENTILATING FANS.
Dodge Sales & Engineering Co.270-271

ROPE FITTINGS—Wire.
American Steel & Wire Co.......321
Broderick & Bascom Rope Co....322
Hazard Mfg. Co................323
Leschen, A., & Sons Rope Co.....324
Macomber & Whyte Rope Co.....325
Moon, Geo. C., Co., Inc..........326
Roebling's, John A., Sons Co.....327
Waterbury Co. 328
Wright Wire Co................329

ROPE GRIPS.
Diamond Machine Co...........308

ROPE HAULS.
(See Haulage, Endless Rope.)

ROPES—Haulage and Tail End.
(See Rope, Wire.)

ROPE—Hoisting.
(See Rope, Wire.)

ROPE PRESERVATIVES.
Burnet Co., The.................332
Texas Co., The.............330-331

ROPE—Transmission.
(See also Wire Rope.)
Macomber & Whyte Rope Co....325
New York Cordage Co., The......244
Waterbury Co. 328

ROPE—Wire.
(See also Mine Supplies.)
American Steel & Wire Co.......321
Broderick & Bascom Rope Co....322
Garton, W. R., Co., The..........530
Hazard Mfg. Co................323
Leschen, A., & Sons Rope Co.....324
Macomber & Whyte Rope Co.....325
Moon, George C., Co., Inc........326
Roebling's, John A., Sons Co.....327
Waterbury Co. 328
Wright Wire Co................329

ROTATORS.
Sullivan Machinery Co.......... 70

ROTARY CONVERTERS.
Allis-Chalmers Mfg. Co......204-205
General Electric Co..........206-207
Ridgway Dynamo and Engine Co. 212-213
Westinghouse Electric & Mfg. Co. 208-209

RUBBER GOODS—Mechanical.
Cancos Mfg. Co.................236
Durabla Mfg. Co................237
Goodrich, B. F., Co., The.........238
Johns-Pratt Co. 239
Jenkins Bros. 233
New Jersey Car Spring & Rubber Co. 240
New York Belting & Packing Co.241
Peerless Rubber Mfg. Co.........242
Quaker City Rubber Co..........243

SAFES—Fire and Burglar Proof.
Howe Scale Co., The............131

SAFETY FIRST SIGNS.
Colonial Supply Co......599-600-601
Mine Safety Appliances Co......590
Safety First Supply Co..........593
Stonehouse Steel Sign Co., The...594

SAFETY GATES—Automatic.
Diamond Machine Co............308
Osborn Machine Co., The.........319

SAFETY LAMPS.
(See also Lamps Safety.)
Draeger Oxygen Apparatus Co...588
Frick & Lindsay Co.........602-603
Koehler Mfg. Co................580
Mine Safety Appliances Co......590
Wolf Safety Lamp Co. of America, Inc. 581

SAFETY SIGNS AND SIGNALS.
Mine Safety Appliances Co.......590
Safety First Supply Co..........593
Stonehouse Steel Sign Co........594

SAFETY STOPS — Automatic Regulation.
Connellsville Mfg. & Mine Supply Co. 300-301

SAND DRYERS—(Mfg.)
(See also Mine Supplies.)
Indiana Foundry Co.............486

SAND DRYERS.
(See also Mine Supplies.)
Electric Service Supplies Co..528-529
Frick & Lindsay Co.........602-603
Indiana Foundry Co.............486

SAWS—Band.
McCoy-Brandt Machinery Co.....373
Somers, Fitler & Todd Co........369

SAWS—Power, Hack.
McCoy-Brandt Machinery Co....373
Somers, Fitler & Todd Co........369

SCALES.
Fairbanks Co., The..............130
Howe Scale Co., The............131
Standard Scale & Supply Co., The.132
Winslow Government Standard Scale Works, Inc..............133

SCALES—Tipple.
Fairbanks Co., The..............130
Howe Scale Co., The............131
Standard Scale & Supply Co., The.132
Winslow Government Standard Scale Works, Inc..............133

SCALES—Track.
Fairbanks Co., The..............130
Howe Scale Co., The............131
Standard Scale & Supply Co......132
Winslow Government Standard Scale Works, Inc..............133

SCALES—Wagon and Truck.
Fairbanks Co., The..............130
Howe Scale Co., The............131
Standard Scale & Supply Co., The.132
Winslow Government Standard Scale Works, Inc..............133

SCRAP—Iron and Steel (Bought).
Frank, M. K...................386
Lazarus, M. E., Co., The.........388

SCRAPER HEADS.
(See also Miners' Tools and Supplies.)
Colonial Supply Co......599-600-601
McKay, James, Co..............361
Warwood Tool Co...............617

SCRAPERS—Flue.
Gem. Mfg. Co..................247

SCREENS—Perforated Metal.
Allis-Chalmers Mfg. Co......204-205
Cross Engineering Co...........123
Hendrick Mfg. Co...............124
Jeffrey Mfg. Co., The........100-102
Remaly Mfg. Co., Inc............125

SCREENS—Manganese Bronze.
Cross Engineering Co...........123
Hendrick Mfg. Co...............124
Remaly Mfg. Co................125

SCREEN BARS.
Connellsville Mfg. & Mine Supply Co. 300-301
Cross Engineering Co...........123
Fairmont Mining Machinery Co.94-99
Hendrick Mfg. Co..............124
Jeffrey Mfg. Co., The........100-102
Phillips Mine & Mill Supply Co..128
Remaly Mfg. Co...............125
Scottdale Machine & Mfg. Co.....110
Tamaque Mfg. Co.............126
Webster Mfg. Co., The...........111
Stephens-Adamson Mfg. Co......118

SCREENS—Revolving and Shaker.
Allis-Chalmers Mfg. Co.....204-205
Allen & Garcia Co............. 93
Connellsville Mfg. & Mine Supply Co. 300-301
Cross Engineering Co...........123
Dempcy-Degener Co. 129
Duncan Foundry & Machine Works 335
Fairmont Mining Machinery Co.94-99
Hendrick Mfg. Co...............124
Holmes, Robert, & Bros., Inc.....306
Jeffrey Mfg. Co., The........100-102
Kanawha Mfg. Co...............104
Link-Belt Co. 103
Montgomery Coal Washing & Mfg. Co. 108
Morrow Mfg. Co., The...........105
Ottumwa Box Car Loader Co.....137
Phillips Mine & Mill Supply Co...128
Pittsburgh Coal Washer Co...106-107
Roberts & Schaefer Co..........109
Robins Conveying Belt Co........122
Scottdale Machine & Mfg. Co....110
Stephens-Adamson Mfg. Co..118-119
Tamaqua Mfg. Co...............126
Webster Mfg. Co., The..........111
Wilmot Engineering Co..........127

SCREENS—Wire Cloth.
Wright Wire Co................329

SCREWS—Lag.
Graham Nut Co.................360
Leetonia Tool Co., The...........615

SECOND HAND MACHINERY.
Dudley Electric & Machine Co....550
Foster, L. B., Co................385
Frank, M. K....................386
Green, L. A....................387
Glow Electric Co., The..........372
Kester Electric Co.............547
Lazarus, M. E., Co., The.........388
McCoy-Brandt Machinery Co.....373
Miller-Owen Electric Co., Inc....374

SECTION INSULATORS.
(See also Electric Supplies.)
Electric Railway Equipment Co...520
Flood City Mfg. Co..........522-523
Union Electric Co...............535

SEPARATORS—Steam.
Harrison Safety Boiler Works...222
Mitchell, W. K., & Co., Inc.......214
Nicholson, W. H., & Co..........234
Sims Co., The..................223

SEPARATORS—Spiral for Coal.
Anthracite Separator Co.........113

SHAFT SINKING.
Dravo Contracting Co., The...... 71
Ferranti Contracting Co., Inc., The 72
Hyde, W. H.................... 73
Patterson, Walter F............. 74

SHAFTS—Air.
Drake, A. W., Drilling Co........ 65
Dravo Contracting Co., The...... 71
Ferranti Contracting Co., Inc., The 72
Hyde, W. H.................... 73
Patterson, Walter F............ 74

SHAFTS—Counter.
Gem. Mfg. Co...................247

SHAFTING.
Beck & Corbitt Iron Co..........598
Buettner & Shelburne Machine Co., Inc. 504-505
Stephens-Adamson Mfg. Co..118-119
Tamaqua Mfg. Co...............126
Tranter Mfg. Co................604
Valley Iron Works.............199
Winterer, Herman L............376

SHAFTING (FLEXIBLE) AND ATTACHMENTS.
Gem Mfg. Co...................247

SHAPERS.
McCoy-Brandt Machinery Co.....373
Somers, Fitler & Todd Co........369
Winterer, Herman L.............376

SHAPES.
(See Structural Material.)

SHARPENER FOR BITS.
Ingersoll-Rand Co. 496
SHEARS.
McCoy-Brandt Machinery Co....373
Somers, Fitler & Todd Co....369
SHEAVES—Plain and Bicycle Type.
Boyts, Porter & Co....415-417
Cherry Tree Machine Co....302
Connellsville Mfg. & Mine Supply Co. 300-301
Diamond Machine Co....308
Fairmont Mining Machinery Co.94-99
Gustafson Mfg. Co....338
Holmes, Robert, & Bros, Inc....306
Hockensmith Wheel & Mine Car Co., The 342-343
Kanawha Mfg. Co....104
Litchfield Foundry & Machine Co.310
Macomber & Whyte Rope Co....325
Montgomery Coal Washing & Mfg. Co. 108
Sanford-Day Iron Works....354
Scottdale Machine & Mfg. Co....110
Tamaqua Mfg. Co....126
Webster Mfg. Co., The....111
SHEET AND PLATE WORK.
Cross Engineering Co....123
Hendrick Mfg. Co....124
Osborn Machine Co., The....319
Vogt, Henry, Machine Co., Inc...194
Walsh & Weidner Boiler Co., The.195
SHELLAC.
(See Insulating Compounds, &c.)
SHINGLES—Asbestos.
Keasbey & Mattison Co....167
SHINGLES—Asbestos Surfaced.
General Roofing Mfg. Co....165
SHINGLES—Asphalt.
General Roofing Mfg. Co....165
National Roofing Co., The....162-163
SHINGLE STAIN—Creosote.
National Roofing Co., The....162-163
SHOES—Horse and Mule.
(See Mine Supplies.)
SHOP EQUIPMENT.
Somers, Fitler & Todd Co....369
SHOVELS.
(See also Mine Supplies.)
Colonial Supply Co....599-600-601
Frick & Lindsay Co....602-603
Fulton Tool Co....614
Hardsocg, Martin, Co., The..612-613
Hardsocg Mfg. Co....612-613
Leetonia Tool Co., The....615
Tracy, Bertrand P....508
Warwood Tool Co....617
SHOVELS—Steam (New and Second Hand.)
Foster, L. B., Co....385
Green, L. A....387
McCoy-Brandt Machinery Co....373
SIDE STRAPS.
Buettner & Shelburne Machine Co., Inc. 504-505
SIDING—Asbestos.
Asbestos Protected Metal Co....164
SIGNAL SETS.
(See Electric Supplies.)
SIGNALING SYSTEMS—Pneumatic.
Electric Service Supplies Co..528-529
Everhart Brass Works, The....315
SIGNS—Attention, Arresting and Accident Prevention.
Colonial Supply Co....599-600-601
Mine Safety Appliances Co....590
Safety First Supply Co....591-593
Stonehouse Steel Sign Co., The...594
SKIPS.
Dempcy-Degener Co. 129
Watt Mining Car Wheel Co., The.357
Wellman-Seaver-Morgan Co., The.313
SKULL CAPS FOR MULES.
Pittsburgh Harness Supply Co...609
SLATE DUMPS.
(See Dumps, Slate and Rock.)
SLEDGES.
Fulton Tool Co....614
Hardsocg, Martin, Co., The...612-613
Hardsocg Mfg. Co....612-613
Leetonia Tool Co., The....615
Warwood Tool Co....617
SLOPE DRIVING.
Dravo Contracting Co., The.... 71
Ferranti Contracting Co., Inc., The 72
Hyde, W. H.... 73
Johannessen, J., & Son.... 67
Patterson, W. F.... 74
SOLDERING IRONS—Electric.
Cutler-Hammer Mfg. Co., The.280-281
SOOT CLEANER.
Simonds, G. L., & Co....203
SPADS—Mine.
Elliott, B. K., Co.... 78
SPADS—Surveyors.
Elliott, B. K., Co.... 78
Howells Mining Drill Co....500
SPIKE BARS.
(See Track Accessories.)
SPIKES—Track.
(See also Mine Supplies.)
Beck & Corbitt Iron Co....598
Buckeye Rolling Mill Co....381
Foster, L. B., Co....385
Frank, M. K....386
Green, L. A....387
Light Railway Equipment Co....395
Richardson & Co., Inc....389
United States Rail Co....383
West Virginia Rail Co., The....384
SPLICERS—Trolley.
(See also Line Material.)
Flood City Mfg. Co....522-523
Standard Railway Supply Co....525
Union Electric Co....535
SPRINKLING CARS.
Flood City Mfg. Co....522-523
SPROCKETS.
Buettner & Shelburne Machine Co., Inc. 504-505
Fairmont Mining Machinery Co.94-99
Pittsburgh Coal Washer Co..106-107
Tracy, Bertrand P....508
SQUIBS.
(See also Blasting Supplies.)
Du Pont, E. I., de Nemours & Co. 562-563-564-565
Hercules Powder Co....567-568-569
Miners' Supply Co....572
STABLE FIXTURES—Wire.
Wright Wire Co....329
STACKS.
Houston, Stanwood & Gamble Co.191
Keeler, E., Co....192
Osborn Machine Co., The....319
Vulcan Iron Works....312
Walsh & Weidner Boiler Co., The.195
STAINS—Shingle.
General Roofing Mfg. Co....165
STANDS.
(See Track Accessories.)
STEAM BRAKES.
Royer & Zweibel....318
STEAM ENGINES.
(See Engines, Steam.)
STEAM HAMMERS.
Buffalo Foundry & Machine Co...367
STEAM SEPARATORS.
(See Separators, Steam.)
STEAM TRAPS.
(See Traps, Steam.)
STEAM TURBINES.
(See Turbines, Steam.)
STEEL BARS.
(See Bars, Iron and Steel.)
STEEL—Manganese.
Wharton, William, Jr., & Co., Inc.397
STEEL MINE TIES.
Cambria Steel Co....400
Fairmont Mining Machinery Co. 398-399
Sweet's Steel Co....382
STEEL RAILS.
(See Rails.)
STEEL TAPES.
Buff & Buff Mfg. Co.... 76
STOKERS.
Armstrong Mfg. Co....197
Combustion Engineering Corp.200-201
General Electric Co....206-207
McClave-Brooks Co. 198
Westinghouse Electric & Mfg. Co. 208-209
STOPS—Safety (Automatic Regulation.)
Connellsville Mfg. & Mine Supply Co. 300-301
STORAGE BATTERIES.
Edison Storage Battery Co....469
Electric Storage Battery Co., The.470
Gould Storage Battery Co....471
Philadelphia Storage Battery Co.472
STORE EQUIPMENT.
Howe Scale Co., The....131
STOVES—Plain Heating.
Indiana Foundry Co....486
STOVES—Sand Drying.
Indiana Foundry Co....486
STRETCHERS.
(See also Mine and Hospital Supplies)
Frick & Lindsay Co....602-603
Williams Improved Stretcher Co..595
STRIPES—Awning and Tent.
Humphrys', R. A., Sons....610
STRUCTURAL PAINTS.
Cheesman & Elliott....160
Detroit Graphite Co....161
Dixon Crucible Co....252
Highland Chemical Products Co..440
STRUCTURAL STEEL.
Beck & Corbitt Iron Co....598
Osborn Machine Co., The....319
Sweet's Steel Co....382
Walsh & Weidner Boiler Co., The.195
Youngstown Steel Car Co....358
Wisconsin Bridge & Iron Co....112
SUPPLIES—Electric.
(See Electric Supplies.)
SUPPLIES—Mine.
(See Mine Supplies.)
SURVEYING INSTRUMENTS.
Buff & Buff Mfg. Co.... 76
Davis Instrument & Mfg. Co.... 77
Elliott, B. K., Co.... 78
Heller & Brightly.... 79
Pease, C. F., Co., The.... 80
SWITCHBOARDS.
(See also Electric Supplies.)
Allis-Chalmers Mfg. Co....204-205
Buettner & Shelburne Machine Co., Inc. 504-505
Electric Service Co., Inc., The....551
General Electric Co....207
Glow Electric Co., The....372
Iron City Electric Co....546
Kester Electric Co....547
McCullough, W. T., Electric Co...532
Miller-Owen Electric Co., Inc....374
Post-Glover Electric Co., The....533
Sackett Mine Supply Co., The....534
Tracy, Bertrand P....508
SWITCH POINTS.
(See Frogs and Switches.)
SWITCHES—Section Insulator.
Flood City Mfg. Co....522-523
Ohio Brass Co., The....524
SWITCHES AND STANDS—(Mfrs.)
Cincinnati Frog & Switch Co., The.390
Clinton Switch Co....391

Elliot Frog & Switch Co.........392
Indianapolis Switch & Frog Co., The 393
Kilby Frog & Switch Co.........394
Light Railway Equipment Co.....395
United States Rail Company.....383
Weir Frog Co...................396
Wharton, William, Jr., & Co., Inc., The 397

TABLES—Picking.
(See Picking Tables.)

TALLOW PITS.
Gem Mfg. Co...................247

TAMPING BAGS.
(See Blasting Supplies.)

TAMPING BARS AND SCRAPERS.
(See Miners' Tools and Supplies.)

TANKS.
Houston, Stanwood & Gamble Co.191
Platt Iron Works................435
Walsh & Weidner Boiler Co., The.195

TAPE—Friction, Rubber and Insulating.
(See Electric Supplies.)

TARPAULINS.
Humphrys', R. A., Sons..........610

TELEPHONES—Mine Service.
(See also Electric Supplies.)
Electric Service Supplies Co..528-529
Garton, W. R., Co., The..........530
Iron City Electric Co...........531
McCullough, W. T., Electric Co...532
Stromberg-Carlson Telephone Mfg. Co. 538
Western Electric Co.........536-537

TEMPERATURE CONTROLLERS.
Boyleston Steam Specialty Co....228

TEMPERING SOLUTION.
Empire Chemical Co............503

TENTS.
Humphrys', R. A., Sons..........610

TESTERS—Rail Bond.
Electric Service Supplies Co..528-529

TESTERS—Safety Lamp.
(See Lamps, Miners' Safety.)

TESTING COAL LANDS.
Drake, A. W., Drilling Co........ 65
Hoffmann Bros. 66
Johannessen, J., & Son........... 67
Punxsutawney Drilling & Contracting Co. 68
Richards, J. R................. 69

TESTS AND EXAMINATIONS.
Stuart, James & Cooke.......... 82

THAWING KETTLES.
(See Blasting Supplies.)

THERMIT WELDING.
Pittsburgh Reinforced Brazing & Machine Co. 375

THIMBLES—Wire Rope.
(See Wire Rope Accessories.)

THROW STANDS.
(See Switches and Stands.)

TIE CLIPS AND BOLTS.
(See Track Accessories.)

TIE PLATES.
(See Track Accessories.)

TIES—Steel Mine.
Cincinnati Frog & Switch Co., The.390
Cambria Steel Co...............400
Fairmont Mining Machinery Co. 398-399
Orenstein-Arthur Koppel Co., The.350
Sweet's Steel Co................382

TINWARE.
Grier Bros. Co., The............583

TIPPLES.
Allen & Garcia Co............... 93
Dempcy-Degener Co. 129
Elmore, G. S...............116-117
Fairmont Mining Machinery Co.94-99
Jeffrey Mfg. Co..........100-101-102
Kanawha Mfg. Co...............104
Link-Belt Co. 103
Montgomery Coal Washing & Mfg. Co. 108
Morrow Mfg. Co., The...........105
Ottumwa Box Car Loader Co.....137
Pittsburgh Coal Washer Co..106-107
Roberts & Schaefer Co...........109
Scottdale Machine & Mfg. Co....110
Stephens-Adamson Mfg. Co..118-119
Webster Mfg. Co., The..........111
Wisconsin Bridge & Iron Co.....112

TIPPLE EQUIPMENT.
Allen & Garcia Co.............. 93
Anthracite Separator Co.........113
Cross Engineering Co...........123
Dodge Sales & Engineering Co. 114-115
Elmore, G. S..............116-117
Fairbanks Co., The.............130
Fairmont Mining Machinery Co.94-99
General Electric Co.............134
Goodrich, B. F., Co., The.........120
Dempcy-Degener Co. 129
Diamond Machine Co............308
Hendrick Mfg. Co...............124
Howe Scale Co.................131
Holmes, Robert, & Bros., Inc.....306
Jeffrey Mfg. Co............100-102
Kanawha Mfg. Co...............104
Link-Belt Co. 103
Main Belting Co................121
Manierre Engineering & Machinery Co. 136
Montgomery Coal Washing & Mfg. Co. 108
Morrow Mfg. Co., The...........105
Ottumwa Box Car Loader Co.....137
Pennsylvania Crusher Co........139
Phillips Mine & Mill Supply Co...428
Pittsburgh Coal Washer Co..106-107
Robins Conveying Belt Co.......122
Roberts & Schaefer Co..........109
Remaly Mfg. Co., Inc...........127
Scottdale Machine & Mfg. Co....110
Stephenson-Adamson Mfg. Co.118-119
Standard Scale & Supply Co., The.132
Tamaqua Mfg. Co...............126
Webster Mfg. Co., The..........111
Westinghouse Electric & Mfg. Co.135
Williams Patent Crusher & Pulverizer Co. 140-141
Wilmot Engineering Co..........127
Winslow Government Standard Scale Works 133
Wisconsin Bridge & Iron Co......112
Youngstown Steel Car Co........358

TIRES—Steel.
Pennsylvania Casting & Machine Works 473
Tracy, Bertrand P...............508

TOILETS.
Pittsburgh Harness Supply Co....609

TOOLS—Blacksmith Shop.
Beck & Corbitt Iron Co..........598

TOOL STEEL.
Beck & Corbitt Iron Co...........598
Colonial Supply Co.......599-600-601

TORCHES—Shop.
Gem Mfg. Co...................247
Elliott, B. K., Co............... 78
Pease, C. F., Co., The........... 80

TRACK ACCESSORIES.
Beck & Corbitt Iron Co..........598
Buckeye Rolling Mill Co.........381
Cambria Steel Co...............400
Cincinnati Frog & Switch Co., The.390
Clinton Switch Co..............391
Duff Mfg. Co...................606
Fairmont Mining Machinery Co. 398-399
Foster, L. B., Co.................385
Frank, M. K...................386
Fulton Tool Co., The............614
Graham Nut Co.................360
Green, L. A....................387
Hardsocg, Martin, Co........612-613
Hardsocg Mfg. Co..........612-613
Indianapolis Switch & Frog Co. The 393
Kilby Frog & Switch Co.........394
Leetonia Tool Co., The..........615
Light Railway Equipment Co.....395
Orenstein-Arthur Koppel Co., The.350
Richardson & Co., Inc...........389
Sweet's Steel Co................382
Templeton, Kenly & Co., Ltd.....607
United States Rail Co............383
Warwood Tool Co...............617
Weir Frog Co...................396
West Virginia Rail Co., The......384
Wharton, William, Jr., & Co., Inc..397

TRACK—Portable.
(See also Track Accessories.)
Fairmont Mining Machinery Co. 398-399
Frank, M. K...................386
Wharton, William, Jr., & Co., Inc..397

TRAMWAYS.
American Steel & Wire Co.......321
Broderick & Bascom Rope Co....322
Dempcy-Degener Co. 129
Hazard Mfg. Co................323
Leschen, A., & Sons Rope Co.....324
Macomber & Whyte Rope Co.....325
Moon, George C., Co., Inc........326
Roebling's, John A., Sons Co......327
Wright Wire Co.................329

TRANSFORMERS.
Allis-Chalmers Mfg. Co......204-205
General Electric Co..........206-207
Moloney Electric Co.............548
Westinghouse Electric & Mfg. Co. 208-209

TRANSITS.
Buff & Buff Mfg. Co............ 76
Davis Instrument & Mfg. Co..... 77
Elliott, B. K., Co............... 78
Heller & Brightly.............. 79
Pease, C. F., Co., The........... 80

TRANSMISSION BELTS.
(See Belting, Transmission.)

TRANSMISSION MACHINERY AND SUPPLIES (Power).
Allis-Chalmers Mfg. Co......204-205
Colonial Supply Co.......599-600-601
Dodge Sales & Engineering Co....245
Fairbanks Co., The.............229
Jeffrey Mfg. Co............100-102
Link-Belt Co...................103
New York Cordage Co...........244
Stephens-Adamson Mfg. Co..118-119
Tamaqua Mfg. Co...............126
Tranter Mfg. Co................604
Webster Mfg. Co................111

TRAPS—Steam.
American Steam Gauge & Valve Mfg. Co. 226
Boyleston Steam Specialty Co....228
Mitchell, W. K., & Co., Inc.......214
Nicholson, W. H., & Co..........234
National Tube Co., The......446-455

TROLLEY EARS.
(See Line Material.)

TROLLEY CLAMPS.
(See Line Material.)

TROLLEY FROGS.
(See Line Material.)

TROLLEY HANGERS.
(See Line Material.)

TROLLEY HARPS.
(See Line Material.)

TROLLEY POLES.
(See also Line Material and Electric Supplies.)
Electric Service Supplies Co..528-529
Flood City Mfg. Co..........522-523
Nuttall, R. D., Co...............482
Kester Electric Co..............547
Sackett Mine Supply Co., The.....534
Union Electric Co...............535

TROLLEY SPLICES.
(See Line Material.)

TROLLEY WHEELS.
(See Wheels, Trolley.)

TRUCKS.
Fairbanks Co., The..............130
Howe Scale Co., The.............131
Standard Scale & Supply Co.....132

TRUCKS—For Mine Cars.
(See Mine Car Trucks.)

TRUCKS—For Mining Machines.
Morgan-Gardner Electric Co.....494

TRUCKS—For Moving Welding and Cutting Outfits.
Imperial Brass Mfg. Co..........368

TUBES—Boiler.
National Tube Co...........446-455

TUNNEL DRIVING.
Dravo Contracting Co., The....... 71
Ferranti Contracting Co., Inc., The 72
Hyde, W. H..................... 73
Johannessen, J., & Son........... 67
Patterson, Walter F............. 74

TURBINES—Steam.
Allis-Chalmers Mfg. Co.....204-205
De Laval Steam Turbine Co......428
General Electric Co..............206
Kerr Turbine Co................211
Ridgway Dynamo & Engine Co. 212-213
Wellman-Seaver-Morgan Co., The.313
Westinghouse Electric & Mfg. Co. 208-209
Allis-Chalmers Mfg. Co......204-205
General Electric Co..........206-207
Kerr Turbine Co................211
Ridgeway Dynamo & Engine Co. 212-213
Westinghouse Electric & Mfg. Co. 208-209

TURBO BLOWERS.
Coppus Engineering & Equipment Co. 202
Ingersoll-Rand Co. 224
Kerr Turbine Co................211
McClave-Brooks Co. 198

TURNOUTS.
(See Frogs and Switches.)

TURNTABLES.
(See Track Accessories.)

TWINE.
(See Rope and Cordage.)

UNIONS.
(See also Mine Supplies.)
Colonial Supply Co.......599-600-601
Lawrenceville Bronze Co.........605
National Tube Co., The......446-455

VALVES—Manufacturers.
American Steam Gauge & Valve Mfg. Co. 226
Ashton Valve Co., The...........227
Boyleston Steam Specialty Co....228
Everhart Brass Works, The......315
Fairbanks Co., The..............229
Foster Engineering Co..........230
Golden-Anderson Valve Specialty Co. 231
Homestead Valve Mfg. Co........232
Jenkins Bros. 233
National Valve & Mfg. Co.......215
National Tube Co., The......446-455
Ohio Brass Co., The..............524

VALVES AND FITTINGS.
(See also Mine Supplies.)
American Steam Gauge & Valve Mfg. Co. 226
Ashton Valve Co., The...........227
Beck & Corbitt Iron Co..........598
Boyleston Steam Specialty Co....228
Colonial Supply Co.......599-600-601
Fairbanks Co., The..............229
Frick & Lindsay Co..........602-603
Foster Engineering Co...........230
Golden-Anderson Valve Specialty Co. 231
Homestead Valve Mfg. Co.......232
Jenkins Bros. 233
National Tube Co., The......446-455
Reineke-Wagner Pump & Supply Co. 437

VALVES—Pump.
Cancos Mfg. Co.................236
Durabla Mfg. Co................237
Goodrich, B. F., Co., The........238
Jenkins Bros. 233
New Jersey Car Spring & Rubber Co. 240
New York Belting & Packing Co..241
Peerless Rubber Mfg. Co.........242
Quaker City Rubber Co..........243

VARNISHES.
National Roofing Co., The...162-163

VARNISHES—Insulating.
(See also Electric Supplies.)
Iron City Electric Co............531
Tracy, Bertrand P...............508
Western Electric Co.........536-537

VENTILATING FANS.
(See Fans, Ventilating.)

VOLTMETERS.
(See also Electric Supplies.)
Iron City Electric Co............531
Tracy, Bertrand P...............508

WAGONS—Larry.
(See Larries, Coke Oven.)

WALL BOARDS.
General Roofing Mfg. Co.........165
National Roofing Co., The....162-163

WASHERS.
(See also Mine Supplies.)
Beck & Corbitt Iron Co..........598
Colonial Supply Co.......599-600-601
Graham Nut Co.................360

WASHERIES.
Allen & Garcia Co............... 93
Dempcy-Degener Co. 129
Elmore, G. H..............116-117
Fairmont Mining Machine Co...94-99
Link-Belt Co. 103
Jeffrey Mfg. Co............100-102
Montgomery Coal Washing & Mfg. Co. 108
Pittsburgh Coal Washer Co..106-107
Roberts & Schaefer Co...........109
Stephens-Adamson Mfg. Co..118-119

WASTE.
(See Mine Supplies.)

WATER COOLERS.
Cordley & Hayes................573

WATER FILTERS.
Permutit Co. 217
Pittsburgh Water Filter Mfg. Co.218
Scaife, Wm. B., & Sons Co.......219

WATER HEATERS.
(See Feed Water Heaters.)

WATER HEATERS—For Miners' Bath Houses.
Sims Co., The...................223

WATER SOFTENER.
Harrison Safety Boiler Works....222
Permutit Co., The...............217
Pittsburgh Filter Mfg. Co........218
Scaife, Wm. B., & Sons Co.......219

WATER SUPPLY CONTRACTORS.
Drake, A. W., Drilling Co........ 65

WATER TUBE BOILERS.
(See Boilers, Water Tube.)

WATERPROOFING MATERIALS.
Cabot, Samuel, Inc...............157
Goodin, Reid & Co...............283
National Roofing Co., The...162-163

WEDGES—Coal.
Fulton Tool Co., The.............614
Hardsocg, Martin, Co........612-613
Hardsocg Mfg. Co...........612-613
Leetonia Tool Co., The...........615
Warwood Tool Co...............617

WEIGH BASKETS.
(See also Tipple Equipment.)
Fairmont Mining Machinery Co.94-99
Duncan Foundry & Machine Works.335
Holmes, Robert, & Bros., Inc.....306

WEIGHING EQUIPMENTS — Automatic.
Dempcy-Degener Co. 129

WEIGHT RECORDERS—Automatic.
Standard Scale & Supply Co., The.132

WELDING AND CUTTING APPARATUS—Oxy-Acetylene.
Imperial Brass Mfg. Co..........368

WELDING—Electric.
Pittsburgh Reinforced Brazing & Machine Co. 375

WELDING—Oxy-Acetylene (Field or Shop).
Osborn Machine Co., The.........319
Pittsburgh Reinforced Brazing & Machine Co. 375

WELDING—Thermit.
Pittsburgh Reinforced Brazing & Machine Co. 375

WHEELBARROWS.
(See also Mine Supplies.)
Colonial Supply Co.......599-600-601
Fairbanks Co., The..............229

WHEELS—Freight Car.
American Car & Foundry Co.336-337
Lobdell Car Wheel Co.......346-347
Pennsylvania Casting & Machine Works 473
Pressed Steel Car Co........352-353

WHEELS—Locomotive.
Kenova Mine Car Co........344-345
Lobdell Car Wheel Co.......346-347
Pennsylvania Casting & Machine Works 473
Southern Wheel Co..............355

WHEELS—Plain and Self-Oiling.
American Car & Foundry Co.336-337
Cherry Tree Machine Co.........302
Duncan Foundry & Machine Works 335
Enterprise Foundry & Machine Works 339
Fairmont Mining Machinery Co.94-99
Fulton Pit Car & Mfg. Co....340-341
Gustafson Mfg. Co...............338
Hockensmith Wheel & Mine Car Co., The 342-343
Irwin Foundry & Mine Car Co....348
Kanawha Mfg. Co...............349
Kenova Mine Car Co.........344-345
Lobdell Car Wheel Co........346-347
Orenstein-Arthur Koppel Co......350
Phillips Mine & Mill Supply Co...351
Sanford-Day Iron Works Co......354
Southern Wheel Co..............355
Star Mfg. Co....................356
Walsh & Weidner Boiler Co.......195
Watt Mining Car Wheel Co.......357
Wharton, William, Jr., & Co., Inc.397
Youngstown Steel Car Co.........358

WHEELS—Mine Car (Roller Bearing).
American Car & Foundry Co.336-337
Duncan Foundry & Machine Works 335
Enterprise Foundry & Machine Works 339
Fulton Pit Car & Mfg. Co., The 340-341
Gustafson Mfg. Co..............338
Hockensmith Wheel & Mine Car Co., The 342-343
Irwin Foundry & Mine Car Co....348
Kanawha Mfg. Co...............349
Kenova Mine Car Co.........344-345
Lobdell Car Wheel Co........346-347
Orenstein-Arthur Koppel Co., The.350
Phillips Mine & Mill Supply Co...357
Sanford-Day Iron Works.........354
Southern Wheel Co..............355
Star Mfg. Co., The..............356
Watt Mine Car Wheel Co., The...357
Youngstown Steel Car Co........358

WHEELS—Re-tired and Refitted.
Hockensmith Wheel & Mine Car Co., The 342-343
Lobdell Car Wheel Co........346-347
Pennsylvania Casting & Machine Works 473

WHEELS—Sprocket.
(See Sprockets.)

WHEELS—Steel Tired.
Pennsylvania Casting & Machine Works 473

WHEELS—Trolley.
(See also Electric Supplies.)
Electric Service Supplies Co..528-529
Flood City Mfg. Co..........522-523
Garton, W. R., Co., The...........530
Iron City Electric Co............531
Leetonia Tool Co., The...........615
McCullough, W. T., Electric Co..532
Ohio Brass Co., The.............524
Sackett Mine Supply Co., The.....534
Tracy, Bertrand P...............508
Union Electric Co...............535
Western Electric Co.........536-537

WHISTLES.
American Steam Gauge & Valve Mfg. Co. 226
Ashton Valve Co., The...........227

WINDOW GUARDS.
Wright Wire Co.................329

WIRE—Asbestos.
D. & W. Fuse Co................517

WIRE CLOTH.
Wright Wire Co.................329

WIRE—Connecting (Blasting).
(See Blasting Supplies.)

WIRE—Copper (Bare and Insulated).
(See also Electric Supplies.)
American Steel & Wire Co.......516
D. & W. Fuse Co................517
Hazard Mfg. Co.................518
Iron City Electric Co............531
Kester Electric Co..............547
Roebling's, John A., Sons Co....519

WIRE—Magnet.
(See also Electric Supplies.)
American Steel & Wire Co....321-516
D. & W. Fuse Co................517
Garton, W. R., Co., The..........530
Hazard Mfg. Co.................518
Iron City Electric Co............531
McCullough, W. T., Electric Co...532
Post-Glover Electric Co., The....533
Roebling's, John A., Sons Co.....519
Western Electric Co.........536-537

WIRE PARTITIONS.
Wright Wire Co.................329

WIRE ROPE—Iron and Steel.
American Steel & Wire Co......321
Broderick & Bascom Rope Co.....322
Frick & Lindsay Co.........602-603
Hazard Mfg. Co.................323
Garton, W. R., Co., The..........530
Leschen, A., & Sons Rope Co.....324
Macomber & Whyte Rope Co.....325
Moon, George C., Co., Inc.........326
Roebling's, John A., Sons Co.....327
Waterbury Co. 328
Wright Wire Co.................329

WIRE ROPE LUBRICANTS.
Burnet Co., The.................332
Cataract Refining & Mfg. Co......251
Dixon, Jos., Crucible Co..........252
Leschen, A., & Sons, Rope Co.....324
Texas Co., The.............330-331

WIRE—Trolley.
(See also Electric Supplies.)
American Steel & Wire Co.......576
D. & W. Fuse Co................517
Hazard Mfg. Co.................518
Kester Electric Co..............547
Iron City Electric Co............531
McCullough, W. T., Electric Co...532
Post-Glover Electric Co., The.....533
Union Electric Co...............535
Roebling's, John A., & Sons Co....519

WOOD PIPE.
Michigan Pipe Co., The...........444
Standard Wood Pipe Co..........445

WOOD PIPE FITTINGS.
Michigan Pipe Co., The..........444
Standard Wood Pipe Co..........445

WOOD PRESERVATIVES.
Barrett Co., The................156
C-A-Wood Preserver Co., Inc.....158
Cabot, Samuel, Inc..............157
Detroit Graphite Co..............161
National Roofing Co.........162-163
Northeastern Co., The............159

WOOD PRESERVATIVE—Creosote.
General Roofing Mfg. Co.........165

WOOD WORKING MACHINERY.
Somers, Fitler & Todd Co.........369

WORMS.
(See Gears & Pinions.)

WRECKING FROGS.
Alexander Car Replacer Mfg. Co., The 485

KEYSTONE
THE.
MINING
CATALOG
COMBINED WITH
COAL FIELD
DIRECTORY
CONSOLIDATED PUBLISHING COMPANY INC.

IF YOU DO NOT FIND WHAT YOU
WANT IN THE MINING
CATALOGUES
WRITE
US

BY-PRODUCT COKE OVENS

IN UNITED STATES AND CANADA

SEPTEMBER 1, 1916

KOPPERS TYPE.

	No. Ovens
Lehigh Coke Co., South Bethlehem, Pa.	424
Maryland Steel Co., Sparrows Point, Md.	120
Republic Iron & Steel Co., Youngstown, O.	143
Cambria Steel Co., Johnstown, Pa.	92
Tennessee Coal & Iron R. R., Fairfield, Ala.	280
Woodward Iron Co., Woodward, Ala.	179
Algoma Steel Co., Sault Ste Marie, Ont.	110
Illinois Steel Co., Gary, Ind.	560
Illinois Steel Co., Joliet, Ill.	280
Coal Products Co., Joliet, Ill.	35
Minnesota Steel Co., Duluth, Minn.	90
Laclede Gas Co., St. Louis, Mo.	56
Inland Steel Co., Indiana Harbor, Ind.	132
Youngstown Sheet & Tube Co., Youngstown, O	204
Toledo Furnace Co., Toledo, O.	96
River Furnace Co., Cleveland, O.	204
United Furnace Co., Canton, O.	47
LaBelle Iron Works, Follansbee, W. Va.	94
Brier Hill Steel Co., Brier Hill, O.	84
Seaboard By-Product Coke Co., Bergen Jct., N. J.	110
Gulf States Steel Co., Alabama City, Ala.	37
American Steel & Wire Co., Newburg, O.	180
Carnegie Steel Co., Clairton, Pa.	640
National Tube Co., Lorain, O.	208
Colorado Fuel & Iron Co., Pueblo, Colo.	120
Minnesota By-Product Coke Co., St. Paul, Minn	60
Total	4585

SEMMET-SOLVAY TYPE.

Philadelphia Sub. G. & E. Co., Chester, Pa.	40
Pennsylvania Steel Co., Lebanon, Pa.	90
Pennsylvania Steel Co., Steelton, Pa.	120
Empire Coke Co., Geneva, N. Y.	46
Semet-Solvay Co., Syracuse, N. Y.	40
Cleveland Furnace Co., Cleveland, O.	100
National Tube Co., Wheeling, W. Va.	120
Semet-Solvay Co., Dunbar, Pa.	110
Semet-Solvay Co., Ensley, Ala.	240
Central Iron & Coal Co., Tuscaloosa, Ala.	60
Semet-Solvay Co., Detroit, Mich.	175
Ashland Solvay Coke Co., Ashland, Ky.	54
Citizens Gas Co., Indianapolis, Ind.	41
By-Product Coke Co., South Chicago, Ill.	240
Milwaukee Coal & Gas Co., Milwaukee, Wis.	160
North Shore Gas Co., Waukegan Falls, Wis.	13
Total	1649

ROTHBERG TYPE.

	No. Ovens
Lackawanna Steel Co., Buffalo, N. Y.	281

GAS MACHINERY TYPE.

Cambria Steel Co., Johnstown, Pa.	28

ROBERTS TYPE.

Chattanooga Coke & Gas Co., Chattanooga, Tenn.	12

WILLPUTTE TYPE.

Coal Products Co., Joliet, Ill.	19

OTTO HOFFMAN TYPE.

New England Gas & Coke Co., Everett, Mass.	400
Camden Coke Co., Camden, N. J.	150
Lackawanna Iron & Steel Co., Lebanon, Pa.	228
Lackawanna Iron & Steel Co., Buffalo, N. Y.	188
Dominion Iron & Steel Co., Sydney, N. S.	520
Carnegie Steel Co., Farrell, Pa.	212
Allegheny By-Products Coke Co., Glassport, Pa.	120
Hamilton Otto Coke Co., Hamilton, Ont.	100
Michigan Alkali Co., Wyandotte, Mich.	30
Citizens Gas Co., Indianapolis, Ind.	100
Zenith Furnace Co., Duluth, Minn.	50
Northwestern Iron Co., Mayville, Wis.	36
Total	2134

SUMMARY.

H. Koppers Company	4585
Semet-Solvay	1649
Otto Hoffman	2134
Rothberg Type	281
Gas Machinery	28
Roberts Type	12
Willputte Type	19
Total	8708

List of Coal Mine Inspectors in The United States

Corrected to September 1, 1916.

ALABAMA.

Chief Mine Inspector.
C. H. Nesbitt, 420 Chamber of Commerce Building, Birmingham.

District Mine Inspectors.
W. P. Smith, Tuscaloosa.
David Kelso, Wylam.
Hugh Lynch, Pratt City.
Thomas Roscoe, Jasper.
S. M. Thompson, Piper.

ALASKA.

U. S. Territorial Mine Inspectors.
Sumner S. Smith, Juneau.
W. J. Maloney, Asst., Nome.

ARKANSAS.

Chief Mine Inspector.
Thomas H. Shaw, Midland.

CALIFORNIA.

Chief Inspector.
Edwin Higgins, 407 Underwood Bldg., San Francisco.

COLORADO.

Commissioner of Mines.
Fred Carroll, Denver.

State Inspector of Coal Mines.
James Dalrymple, Denver.

Deputy Inspector of Coal Mines.
F. N. Oberding, Louisville.
Henry King, Denver.
Jas. W. Graham, Lafayette.
A. E. Thompson, Denver.

IDAHO.

State Mine Inspector.
Robert N. Bell, Boise.

ILLINOIS.

State Inspector of Mines.
Ben D. Roberts, Streator.
Thos. H. Devlin, Assumption.
Geo. L. Morgan, Pekin.
David Z. Thursh, Farmington.
J. E. Jones, Benton.
John Garrity, Riverton.
Archibald Frew, Gillespie.
John Kaney, Centralia.
William Hartman, Belleville.
John McClintock, Murphysboro.
J. W. Starks, Georgetown.
James S. Reid, Carterville.

Chief Clerk State Mining Board.
J. F. Morris, Springfield.

INDIANA.

Deputy Inspector of Mines.
Michael Scollard, Indianapolis.

Assistant Deputy Inspectors.
Edward Church, Sullivan.
Jos. Fennell, Linton.
J. C. Wright, Booneville.
W. C. Moore, Clinton.
Chas. Fox, Terre Haute.

IOWA.

State Mine Inspectors.
W. E. Holland, Albia.
R. T. Rhys, Ottumwa.
Ed. Sweeney, Des Moines

Secretary to Iowa Mine Inspectors.
L. E. Stamm, Des Moines.

KANSAS.

Com. of Labor.
P. J. McBride, Topeka.

Asst. Com. of Labor.
John Pellegrino, Pittsburg.

Deputy Mine Inspectors.
James Sherwood, Pittsburg.
Charles Paisley, Pittsburg.
Martin Kotzman, Frontenac.
Fred Green, Columbus.
Thomas Turvey, Scranton.

KENTUCKY.

Chief Inspector of Mines.
C. J. Norwood, Lexington.

Assistant Mine Inspectors.
G. T. Sears, Central City.
H. S. Sizemore, Earlington.
J. W. Reed, Lexington.
R. D. Clere, Ashland.
J D. Cain, Pineville.

MARYLAND.

State Mine Inspector.
William Walters, Midland.

MICHIGAN.

State Coal Mine Inspector.
Thos. Kanary, St. Charles.

MISSOURI.

Chief Mine Inspector.
George Hill, Bevier.

State Mine Inspectors.
Coal Mines.
Evan Jones, Higbee.
Ben. B. Fisher, Lexington.

MONTANA.

Chief Mine Inspector.
William B. Orem, Helena.

Assistant Mine Inspector.
D. J. McGrath, Butte.

State Mine Inspector.
John Sanderson, Helena.

NEW MEXICO.

State Mine Inspector.
W. W. Risdon, Gallup.

NORTH DAKOTA.

State Engineer and Ex-Officio Coal Mine Inspector.
J. W. Bliss, Bismark.

OHIO.

Chief Deputy, Division of Mines.
Jas. Pritchard, (Majestic Theatre Bldg.) Columbus.

Deputy Mine Inspectors
Dan C. Jones, Coalton.
Jas. Dugan, Murray City.
J. T. Cox, Glouster.
Elmer Sagle, Roseville.
E. W. Smith, Byesville.
Saml. Jones, Magnolia.
J. P. Davis, Alliance.
F. P. Carey, Flushing.
W. B. Milgate, New Straitsville.
H. F. McCauley, Columbus.
Kebner McConnell, Columbus.

OKLAHOMA.

Chief Mine Inspector.
Ed. Boyle, Oklahoma City.

Assistant Mine Inspectors.
Tom Scott, Coalgate.
W. T. Williams, Krebs.
Frank Haley, Henryetta.

PENNSYLVANIA.

Chief of Department of Mines.
James E. Roderick, Harrisburg.

Anthracite Inspectors.
State Mine Inspectors.
P. J. Moore, Carbondale.
I. M. Evans, Scranton.
S. J. Phillips, Scranton.
Jenkin T. Reese, Scranton.
Augustus McDade, Rendham.
Hugh McDonald, Pittston.
T. J. Williams, Wilkes-Barre.
S. J. Jennings, Pittston.
D. T. Davis, Wilkes-Barre
Jos. J. Walsh, Nanticoke.
D. J. Roderick, Hazleton.
P. C. Fenton, Mahanoy City.
A. B. Lamb, Shenandoah.
J. A. O'Donnell, Centralia.
David T. Williams, Scranton.
Robert Johnson, Pittston.
John B. Corgan, Wilkes Barre.
Frank Kettle, Wilkes Barre.
John J. Strickler, Hazleton.
Keran Donohue, Pottsville.
B. I. Evans, Mt. Carmel.
P. J. Friel, Shamokin.
Isaac M. Davies, Lansford.
John Curran, Pottsville.
M. J. Brennan, Pottsville.
Chas. J. Price, Lykens.
Benjamin Maxey, Forest City

Bituminous Inspectors
State Mine Inspectors.
Alexander McCanch, Monongahela.
C. B. Ross, Latrobe.
T. K. Adams, Mercer.
Elias Phillips, Dubois.
Isaac G. Roby, Uniontown.
T. D. Williams, Johnstown.
C. P. McGregor, Crafton.
Joseph Knapper, Philipsburg.
P. J. Walsh, Connellsville.
J. J. McDonald, Greensburg.
Joseph Williams, Altoona.
Thos. A. Furniss, Punxsutawney.
William Langan, Elizabeth.
David Young, Freeport.
Alexander Monteith, Patton.
W. H. Howarth, Brownsville.
John I. Pratt, 7740 Bennett St., Pittsburgh.
Thomas A. Mather, Tyrone.
James J. Stoker, Irwin.
F. W. Cunningham, Somerset.
C. P. Byrne, Charleroi.
John F. Bell, Dravosburg.
Edward E. Girod, Masontown.
Nicholas Evans, Johnstown.
Thomas S. Lowther, Indiana.
P. J. Callaghan, Bridgeville.
Harry Phythyon, Belle Vernon.
Thomas H. Thompson, Punxsutawney
P. S. King, 612 N. Canal St., Pittsburgh.
C. H. Crocker, Blairsville.

TENNESSEE.

Chief Mine Inspectors.
R. A. Shiftlett, Nashville.
L. E. Card, Coal Creek.
E. W. Mansfield, Rockwood.

TEXAS.

State Mine Inspector.
B. S. Gentry, Austin.

UTAH.

State Mine Inspector.
J. E. Pettitt, Salt Lake City.

VIRGINIA.

Commissioner of Labor.
James B. Doharty, Richmond.

State Mine Inspector.
A. G. Lucas, Richmond.

WASHINGTON.

Chief Mine Inspector.
James Bagley, Seattle.

Deputy Mine Inspector.
Simon Ash, Seattle.

WEST VIRGINIA.

Chief of Dept. of Mines.
Earl A. Henry, Charleston.

District Mine Inspectors.
W. B. Riggleman, Fairmont.
F. E. Parsons, Clarksburg.
L. D. Vaughn, Grafton.
W. B. Plaster, Logan.
R. B. Cobb, Charleston.
Geo. R. Cook, Thomas.
Andrew Calderwood, Charleston.
Eli J. Mason, Montgomery.
John I. Absalom, Montgomery.
L. B. Holliday, Beckley.
R. B. Erskine, Bramwell.
Lawson Blenkinsopp, Landgraff.
J. W. Gates, Williamson.
J. G. Vaughn, Fayette.
S. M. McMahan, Wellsburg.

WYOMING.

State Coal Mine Inspectors.
George Blacker, Cumberland.
G. W. Akin, Sheridan.

KEYSTONE
THE.
MINING
CATALOG
COMBINED WITH
COAL FIELD
DIRECTORY
CONSOLIDATED PUBLISHING
COMPANY INC

DEVELOPMENT AND ENGINEERING SECTION

The following concerns have catalogue descriptions in this section:

Buff & Buff Mfg. Co.
Cement Gun Co., Inc.
Davis Instrument & Mfg. Co.
Drake, A. W. Drilling Co.
Dravo Contracting Co.
Elliott, B. K. Co.
Ferranti Contracting Co.
Heller & Brightly.
Hoffman Brothers.
Hyde, W. H.
Johannessen, J., & Son.
Patterson, Walter F.
Pease, C. F. Co.
Punxsutawney Drilling & Contracting Co.
Randolph-Means Co.
Richards, J. R.
Stuart, James & Cooke, Inc.
Sullivan Machinery Co.

For additional descriptions of Development and Engineering Companies not appearing in this section, refer to Index of Products in front of book

A. W. DRAKE DRILLING COMPANY

712-713 Markle Bank Building
HAZLETON, PA.

Drilling & Water Supply Contractors

Our Specialty---Drilling Holes of Large Diameter

"Holes Drilled Any Size, Any Depth, For Any Purpose, Anywhere."

Products

Bore-holes for rope-ways, column pipe, steam pipe, air pipe and exhaust pipe in mines, tunnels and subways, for flushing mine workings with culm or other substances, for ventilation and exits from mines.

Bore holes for plunger elevators.

Water systems for cities, towns, manufacturing plants and country homes.

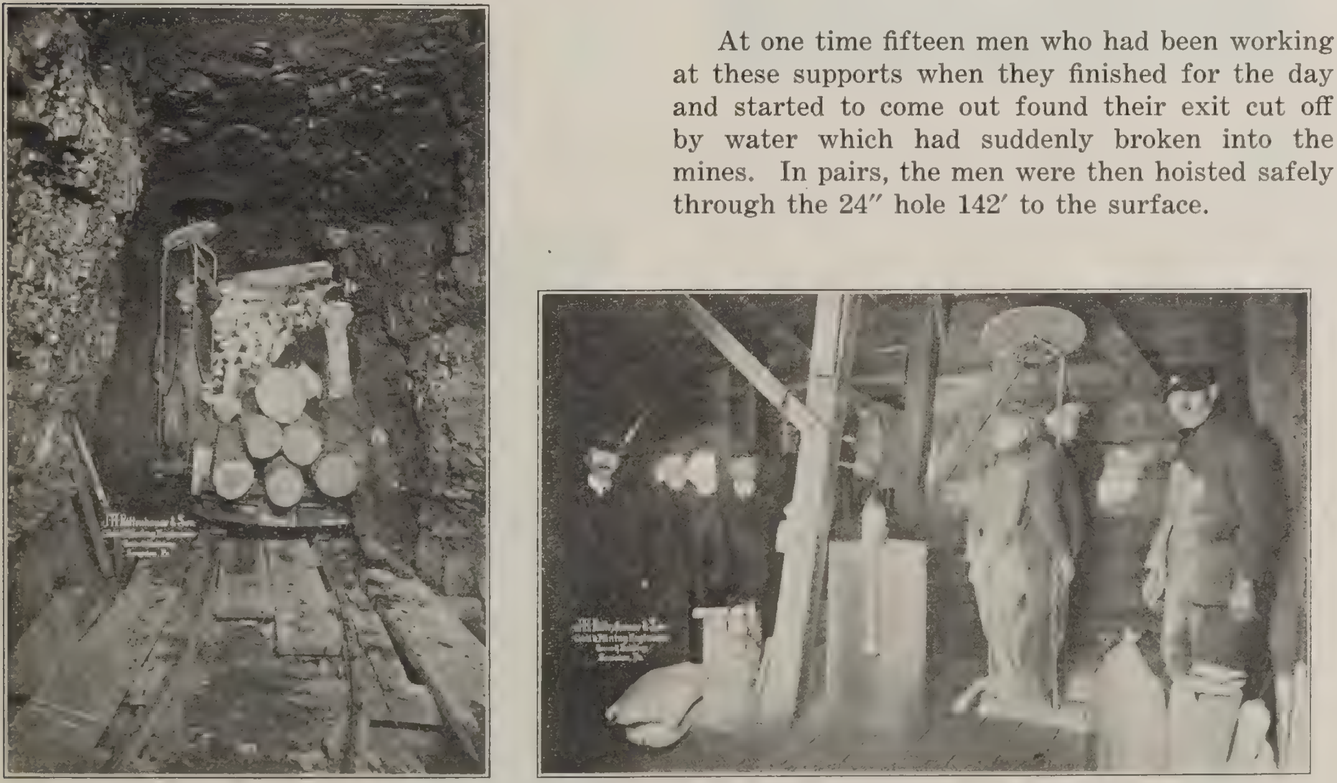
Artesian wells drilled and tested.

We have drilled holes 30″ in diameter to a depth of 600 ft., and 24″ in diameter ranging in depth from 200 ft. to 750 ft.

The two photographs below show the bottom of a 24″ hole down through which a lot of timber and two men have been lowered, and also the top of the same hole with two men on the cage who have just come up through the hole together.

This 24″ hole was drilled for the Pennsylvania State Armory Board at the Armory in Scranton, Penna., and is used for taking materials into the workings for use in building artificial supports for the surface which had caved and damaged the Armory.

At one time fifteen men who had been working at these supports when they finished for the day and started to come out found their exit cut off by water which had suddenly broken into the mines. In pairs, the men were then hoisted safely through the 24″ hole 142′ to the surface.



Views of hoisting men through 24″ bore hole drilled for the Pennsylvania State Armory Board at Scranton, Penna.

HOFFMAN BROS.

1 Eberhart Building
PUNXSUTAWNEY, PA.

Contractors, Diamond Core Drilling

Our Speciaity---Testing Bituminous Coal Lands

Successful Coal Mining
is dependent upon a number of conditions, none of which is more important than the preliminary work and examination of property values.

We Furnish Data
through our DIAMOND DRILL RECORDS, which enables you to estimate land values and invest wisely. These records further enable your engineers to make your plans for a SUCCESSFUL OPERATION.

SHOWING ONE OF OUR COMPLETE EQUIPMENTS INCLUDING PUMPING OUTFIT

To Carry Insurance Is Good Business

Diamond Drilling is your insurance against possible failure. Allow us to prove to your entire satisfaction, THE VALUE OF YOUR PROPERTY, by removing for you 2¼″ cores through all strata and GUARANTEEING SATISFACTORY COAL CORES. This gives you INSIDE INFORMATION for your benefit and no one else. Is it not better to spend the interest on your principal than to invest your principal and lose it?

Ours Is a Business of Service

Through all of these years, it has been our aim to so equip ourselves that we should be prepared to render our patrons the very best possible service at the lowest possible cost. With this object in view, we have devoted our entire time and energy in PREPAREDNESS FOR SERVICE.

With Sixteen (16) Completely Equipped Diamond Core Drills
all especially adapted for drilling Bituminous Coal, and the full advantages of the very best machine shop work, our facilities for service cannot be questioned.

We Have a Strong Organization of Diamond Drillers Who Are Thoroughly Competent and Reliable

These men are in our employ year after year, and have developed the skill and ability necessary to do work quickly and accurately. We do contract work in the Winter as well as in the Summer. We are pleased to have small contracts from responsible firms, as they afford us an opportunity of becoming acquainted, and also enable us to keep our drillers busy between the larger contracts.

ONE OF OUR 3000 FOOT CAPACITY SHOWING HIGH DERRICK

Our Reputation as Successful Diamond Drillers
has been built up through a large list of successful Coal Operators and Mining Engineers who call on us year after year for their Diamond Drill Work. Many of the most prominent Coal Companies and Mining Engineers of the Bituminous Coal Fields know us through the development and prospecting of many different properties during the last fifteen years.

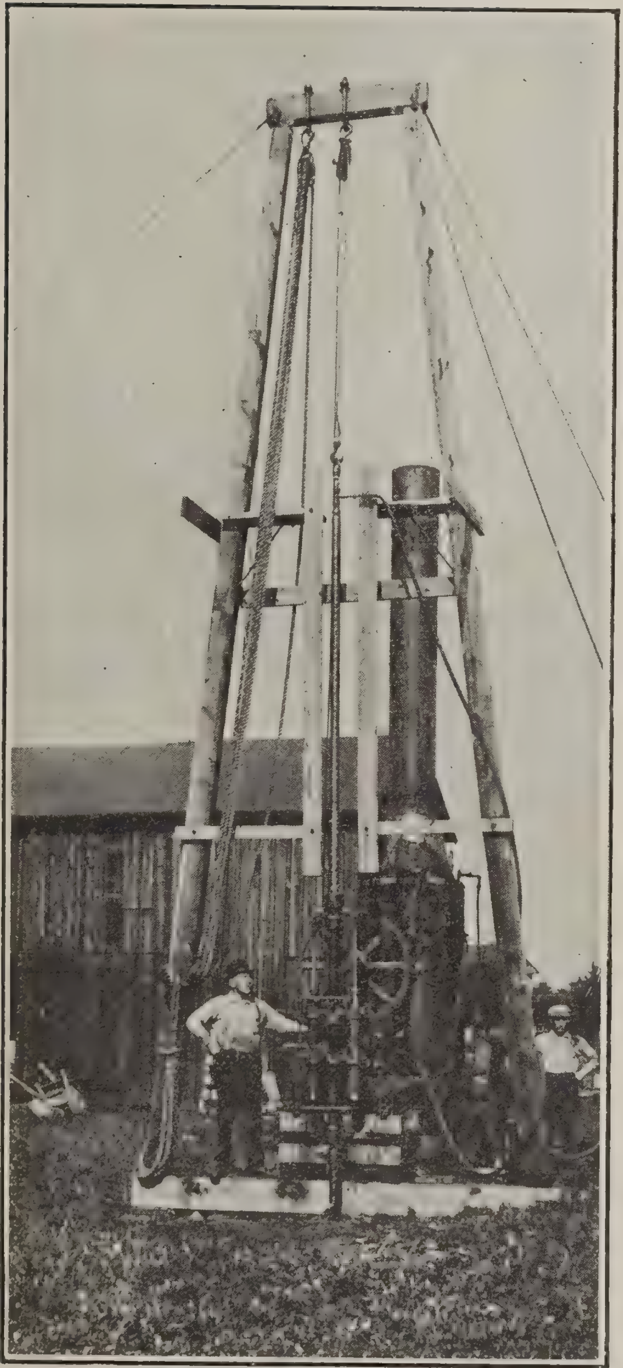
SHOWING OUR EQUIPMENT TO OVERCOME SURFACE CONDITIONS

WE SOLICIT YOUR INQUIRIES. WE NEED YOUR BUSINESS AND WE CONFIDENTLY BELIEVE YOU WILL WANT TO TAKE ADVANTAGE OF OUR FACILITIES FOR SERVICE.

J. JOHANNESSEN & SON

PUNXSUTAWNEY, PA.

Diamond Drilling Contractors



One of Our Latest Improved Machines.

Products

Diamond Core Drilling.

Sinking of Shafts and Slopes.

Driving of Drifts and tunnels.

Concrete Work.

Experience

We have been doing diamond drilling and contracting work with a great number of coal mining companies for a number of years. All our work has proven very satisfactory and you can refer to anyone that we have done business with.

Our experience has brought us in contact with peculiar conditions found among mining properties, and we have been able to meet all these conditions satisfactorily. Below you will find a few of the concerns we have done work for in the past.

Quemahoning Coal Co., Somerset, Pa.

Cambria Steel Co., Johnstown, Pa.

Quemahoning Creek Coal Co., Somerset, Pa.

Staufer Bros., Listie, Pa.

Lehigh Coal & Navigation Co., Landsford, Pa.

Equipment

We have several types of equipment, as per illustration shown on this page, and have a sufficient number of machines to take care of any size work.

We have constructed a new diamond drill, which is the latest machine made. It is driven by turbine steam engines, and is the first and only equipment of this character in the world. It is very economical to operate. This machine will be able to do considerably more work than any other equipment made, as it will require less time for repairs, will be operated with half of the amount of steam required to operate other drills and in an all around way, will be more efficient than any of the other equipment made.

In conclusion, we wish to ask for the opportunity to submit our plan and service on any work contemplated.

Punxsutawney Drilling & Contracting Co.

Weber Building, Punxsutawney, Pa.

Hans Olson, President

John A. Fisher, Secretary & Treasurer

Testing mineral lands with the diamond drill is now acknowledged to be the only satisfactory way. In this advanced age of keen competition it would be considered poor business judgment for any individual or corporation to purchase a property supposed to be rich in minerals without being absolutely certain as to whether it does or not. The only way to find out is to have the property tested by the diamond drill. By this method you secure a core of the entire distance drilled. Accurate measurements of all strata passed through are furnished, and a complete core for chemical analysis is the final result.

Testing Coal Land Is Our Business

We are the pioneers in the diamond drilling business in Pennsylvania. We have gone through all phases of the business, and believe we have gleaned a pretty thorough knowledge of how to do the work right in our twenty-five years' experience. SO CONFIDENT ARE WE OF OUR ABILITY THAT WE GUARANTEE SATISFACTION.

Selecting a man to test your mineral lands is just as important as selecting your lawyer or your doctor—you want the best. You cannot afford to take a chance on inexperienced or incompetent men in either case. Our ability is unquestioned and our prices for the work are reasonable. We have plenty of drills and a force of skilled workmen at all times and can take care of your work on short notice. With the best machinery on the market and a force of experienced, reliable workmen, most of whom have been with us a greater part of the twenty-five years we have been testing coal lands, we have an organization that can produce results.

Our best advertisement has been the satisfactory service we have rendered some of the largest concerns in the United States, any of whom you are at liberty to write concerning our reliability. For your information and convenience we mention a few of these as follows:

PENNSYLVANIA

Berwind-White Coal Mining Co.	Philadelphia, Pa.
Rochester & Pittsburgh Coal & Iron Co.	Punxsutawney, Pa.
Buffalo & Susquehanna Coal Mining Co.	Dubois, Pa.
Northwestern Mining & Exchange Co.	Dubois, Pa.
Merchants Coal Co.	Pittsburgh, Pa.
Clearfield Bituminous Coal Corporation	Clearfield, Pa.
Keystone Coal & Coke Co.	Greensburg, Pa.
Pennsy Coal Co.	Franklin, Pa.
E. V. d'Invilliers, Mining Engineer	Philadelphia, Pa.
J. S. Sillyman & Co., Mining Engineers	Altoona, Pa.
John F. Torrence	Connellsville, Pa.
E. W. Eisler	Butler, Pa.

OHIO

American Sheet & Tinplate Co.	Pittsburgh, Pa.
George M. Jones Co.	Toledo, O.
W. H. Warner & Co.	Cleveland, O.

ILLINOIS

Cleveland, Cincinnati, Chicago & St. Louis Ry.	Chicago, Ill.

WEST VIRGINIA

Consolidation Coal Co.	Fairmont, W. Va.
Davis Coal & Coke Co.	Cumberland, Md.
Elkins Coal & Coke Co.	Morgantown, W. Va.
New River & Pocahontas Consolidated Coal Co.	Charleston, W. Va.
Faraday Coal & Coke Co.	Gary, W. Va.
Virginia-Pocahontas Coal Co.	Johnson City, Tenn.
New River Collieries Co.	Eccles, W. Va.

KENTUCKY

West Kentucky Coal Co.	Sturgis, Ky.

We would be pleased to submit prices on your next contract for drilling. A telegram, postal card or telephone call will bring our representative to you.

J. R. RICHARDS

INDIANA, PA.

Diamond Drill Contractor

Take no Chances

Test your property before you spend a lot of money in developing it and find that you do not have the quanity and quality that you had expected, I have known of a good many instances of the coal showing up good on the outcrop and after headings had been driven back into the hills the coal had pinched down to a thickness that it was to thin to work and a great amount of money had been spent for plant and equipement which had to be dismantled, where in the first place several drill holes had been drilled it would of saved all this expense.

Diamond Core Drilling.

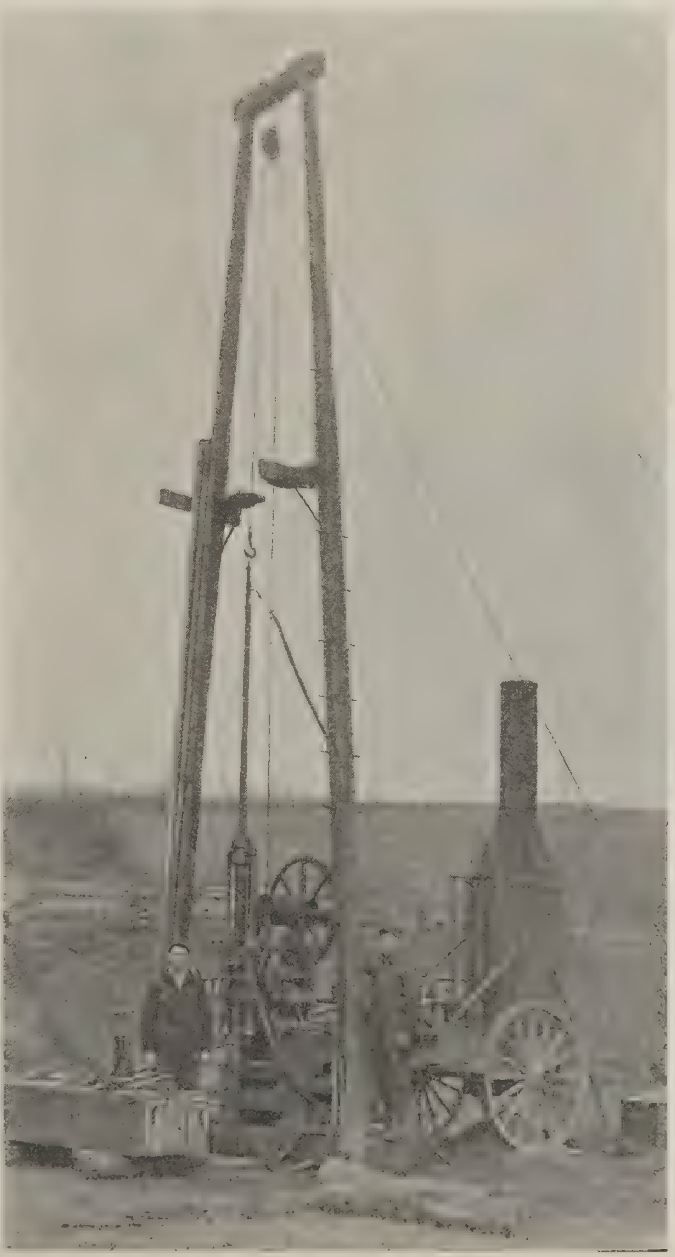
to do that work I have a complete equipment and crews of experienced drillers who have been with me for 15 years of which you may well take advantage.

I have been in the Diamond Drill business for 26 years and have done work for the largest Operators in United States any of which you can inquire of my work.

For your information I will mention a few of these as follows:

Berwind White Coal Mining Co.,	Philadelphia, Pa.
Rochester Pittsburg C. & I. Co.,	Punxsutawney, Pa.
Cambria Steel Co.	Johnstown, Pa.
Pa. Coal & Coke	Patton, Pa.
Beaverdale Coal Co.	Beaverdale, Pa.
Maryland Coal Co.	Cumberland, Md.
Graff Coal Co.	Blairsville, Pa.
Struthers Furnace Co.	Struthers, O.
Oak Ridge C. & C. Co.	Hastings, Pa.
W. P. Rend & Co.	Chicago, Ill.
Glenwood Coal Co.	Philadelphia, Pa.
Cymbria Coal Co.	Philadelphia, Pa.
Jos. G. Beale	Leechburg, Pa.
Kennerly Coal & Coke Co.	Philadelphia, Pa.
Mifflin Coal Co.	Pittsburgh, Pa.
Empire Coal Co.	Philadelphia, Pa.
Corrigan McKinney	Cleveland, O.
Operators Coal Mining Co.	Johnstown, Pa.
Clark Brothers Coal Co.	Philadelphia, Pa.
Haws Coal Co.	Johnstown, Pa.
E. H. Jennings Bros.	Pittsburgh, Pa.
Loyal-Hanna Coal & Coke Co.	Philadelphia, Pa.
Graceton Coke Co.	Graceton, Pa.
J. V. Thompson	Uniontown, Pa.
Clearfield Bituminous Coal Corp.	Clearfield, Pa.

I would be pleased to submit prices on your next contract for drilling.



SULLIVAN MACHINERY COMPANY

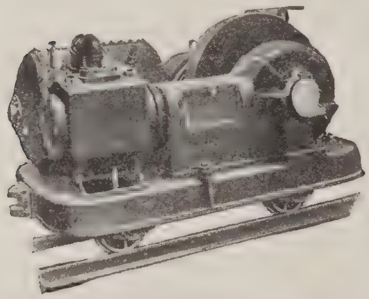
122 South Michigan Avenue, Chicago, Ill.

Works: CHICAGO; CLAREMONT, N. H.

BIRMINGHAM
BOSTON
DENVER
EL PASO
HUNTINGTON
JUNEAU
KNOXVILLE
LONDON
NEW YORK
PARIS
PETROGRAD
PITTSBURGH
SALT LAKE CITY
SCRANTON
SPOKANE
ST. LOUIS
SYDNEY, N. S. W.
VANCOUVER, B. C.

Sullivan Portable Air Drilling Rigs will enable you to get rid of rock in your mine, quickly, conveniently and at low cost for power and labor. These outfits include a **Sullivan "WK2" Air Compressor and Sullivan Rotators.**

They are independent, except for the electric feed wire and can go anywhere in the mine where rails can be laid.



Sullivan Portable Electric-Driven Compressor "WK-2"

"WK2" Compressors like the one illustrated, are mounted on a heavy-base truck, and are complete, with damp-proof motor, starting panel, air receiver and unloading device. An open hopper jacket simplifies the cooling of the air cylinder.

With this rig you can drive a tunnel, cut a break-through or an overcast, brush roof, take up bottom, dig a sump, do any job of rock drilling, light or heavy, long or short.

A self-propelling attachment may be added, if desired, eliminating haulage delays. Built in four sizes. Ask for Bulletin 58-PD.

Rotator with auger steel for coal or shale.

Booklet 115-D illustrates all types of Sullivan Air Compressors.

A WK-2 Compressor and a Sullivan Pick Machine or a Post Puncher make an economical plant for development or for the small mine.

Rotators weigh 38 lbs., drill holes up to 8 feet deep, use hollow steel. Automatic bit rotation and tool retainer make handling easy. Built in several styles. Capable of any drilling work, from rapid shaft sinking to block-holing rock fragments. Screw-feed and pnufeed mountings if required.

Bulletin 70-AD.

Part of a group of 10 Rotators sinking a large shaft.

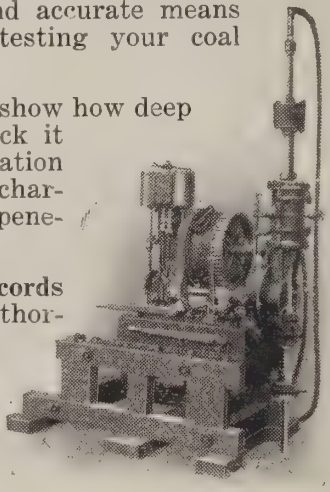
Sullivan Diamond Core Prospecting Service

(Established in 1884)

is the most reliable and accurate means you can employ for testing your coal property.

Sullivan Drill Cores show how deep the seam lies, how thick it is, the presence and location of partings, and the character of strata to be penetrated in development.

Sullivan Drill Records are accepted as final authority by engineers and mine owners everywhere.



Sullivan Diamond Drill

What We Do

Sullivan Contract Drill service includes the use of the most uptodate drilling machines and tools, by skilled operators trained in our organization.

The drills are operated day and night.

The cores are preserved under lock and key for our customers' information only.

We supply logs at completion of the work showing a record of the borings.

We do from 10 to 15 miles of contract drilling annually.

Shall we send one of our field experts to learn your requirements and quote you a price per foot?

Booklet 113D contains further details.

For those who desire to conduct their own drilling work, Sullivan Coal Prospecting Core Drills are available in a variety of sizes and types. Catalogues 65AD and 65CD contain full information.

A few results of Sullivan Diamond Drilling

THE DRAVO CONTRACTING CO.

Diamond Bank Building, Pittsburgh, Pa.

Engineers and Contractors - Shaft Sinking

Slopes, Tunnels, Complete Mining Plants, Pneumatic Caissons, Submarine Construction, Dams, Sea Walls, Bridge Piers, All-Steel Coal Barge Construction

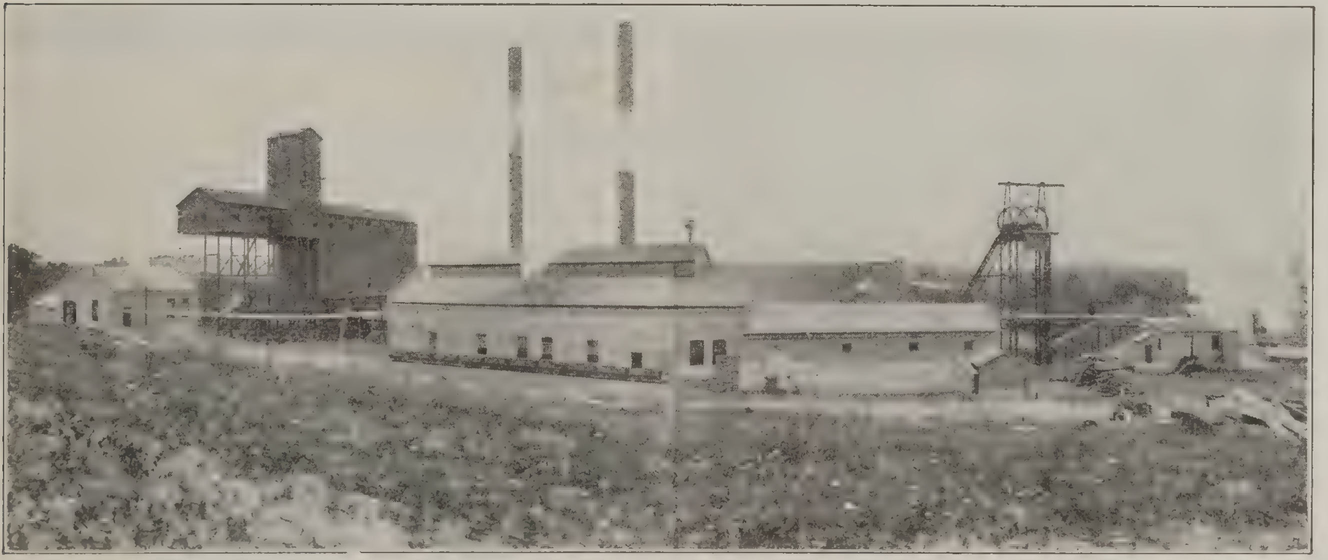
In the last fifteen years we have sunk over 35,000 feet of shafts—nearly 7 miles. This volume of sinking under so many varied conditions has given us the opportunity for the successful development of a process of sealing water-bearing rock strata by cementation, enabling us now to guarantee a practically dry shaft in even the wettest country.

Our biggest work in the shaft line was the sinking and water-sealing of 26 shafts on the new 70-mile Catskill Aqueduct for New York City—over 50 per cent. of the total on the entire waterway—their depth ranging from 200 feet to 700 feet. Our work has carried us to every coal mining State in the East, and, while the most of our sinking has been for the older and larger mining interests, such as the Frick Coke Company, the Berwind-White Coal Mining Company, the Pittsburgh Coal Company, and their various allied interests, for whom we have sunk 26 shafts, we have put down over 60 openings for companies new in their fields.

While our shaft-sinking department handles probably only one-third of our annual business, we have under contract at the present writing more footage than that of all the other shaft contractors combined.

Our large repair and structural shops on our 20-acre property on Neville Island, near Pittsburgh, enable us to keep our plant in first class condition. A store of dry sand and gravel kept constantly to a 70,000-ton pile by one of our own sand dredges, a quantity of lumber and timber ranging between three hundred and five hundred thousand feet, and a well-balanced stock of pipe and fittings and small tools, have made our yard a valuable means for gaining not only a quick start, but a sure and prompt source of supply.

These few facts are presumably some of the reasons why we have done the big bulk of the recent shaft sinking in the East.



Berry No. 3 Mine, Ford Collieries Co., Curtisville, Pa. Shafts, Foundations and Mine Buildings Constructed by us, 1914.

THE FERRANTI CONTRACTING CO.

(Incorporated)

322 E. Norwegian Street Pottsville, Pa.

General Contractors for All Kinds of

Rock and Tunnel Work, Shaft Sinking, Etc.

Products

Sinking of Shafts and Slopes—Concrete or Timber Lined.

Driving of Tunnels, Gangways, Pump Rooms, etc.

Specialty on heavy pitch work such as Airways, Slopes, Chutes, etc.

Perform work by Single Hand Hammer, Piston or Hammer Drills, Stoper, or any way company wishes work done.

We furnish steam or electric driven air compressor, pipes, all machinery, tools, supplies, etc.

Work guaranteed and performed according to any specifications submitted.

Reference

A—1 references on request.

We invite correspondence and will bid on work anywhere.

W. H. HYDE

Contractor

P. O. Box 791, Pittsburgh, Pa.

1305 Delafield St., N. W., Washington, D. C.

Products

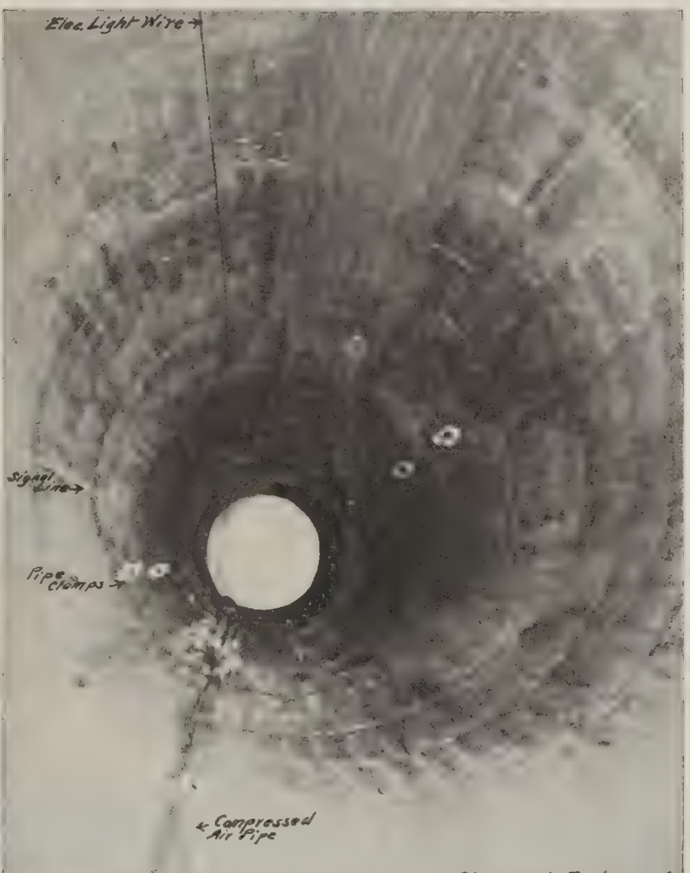
Shaft Sinking, Tunneling, Rock Excavation, Concrete and Construction inside Coal Mines.

Timber-lined Shafts Remodeled and Lined with Concrete.

"Wet" Shaft in Pennsylvania During Sinking.

One of Seven Similar Pump Rooms Inside Shaft Mines in W. Va.

Shaft Sinking in Alberta, Canada.



Interior View of Circular, Concrete-Lined Shaft at Eccles, W. Va. Looking down during Construction. Nov. 1914.

WALTER F. PATTERSON
WALTER F. PATTERSON, JR.

Offices:
337 Oliver Bldg., Pittsburgh, Pa., P. O. Box 786
Waverly, Ohio, P. O. Box 179

General Contractors

Shaft Sinking Tunneling, Heavy Rock Work, Bridge Work and All Kinds of Concrete Work

Products

We specialize on Shaft Sinking; Shafts Timber or Concrete Lined; Rectangular, Square, Oval or Round. Tunnels and Slopes, Single or Double Track, Brick, Concrete or Timber Lined.

Reference

SOME OF THE SHAFTS AND SLOPES WE HAVE SUNK.

Name of Company	Works	Size	D.pth, Ft.
	PENNSYLVANIA		
Buffalo-Susquehanna Co.	Big Run, No. 1	12 x24	280
Buffalo-Susquehanna Co.	Big Run No. 2	12 x26	280
Hecla Coal & Coke Co.	Hecla, No. 3	12 x24	300
Hecla Coal & Coke Co.	Hecla, No. 3, Air	12 x18	300
Ellsworth Collieries Co.	Ellsworth, No. 1	12 x24	271
Ellsworth Collieries Co.	Ellsworth, No. 2	12 x24	292
Ellsworth Collieries Co.	Ellsworth, No. 3	12 x24	405
Ellsworth Collieries Co.	Ellsworth, No. 4	12 x24	426
Ellsworth Collieries Co.	Ellsworth, No. 5	14 x31	256
H. C. Frick Coke Co.	Filbert, No. 1	14 x28	565
H. C. Frick Coke Co.	Filbert, No. 2	15 x31	592
H. C. Frick Coke Co.	Redstone, Air	14 x36	380
Henrietta Coal Co.	Dunlo, Air	13 x17	123
Penn'a. Coal & Coke Co.	Summerhill, Air	10 x12	405
Pittsburgh-Buffalo Co.	Rachel	22 x33	485
Pittsburgh-Buffalo Co.	Marianna	22 x33	485
Pittsburgh-Buffalo Co.	Agnes	12 x24	480
Portage Coal Mining Co.	Portage, No 1	13 x27	380
Rices Landing Coal & Coke Co.	Rices Landing, No. 1	12 x24	181
Rices Landing Coal & Coke Co.	Rices Landing, No. 2	12 x18	189
Sonman Shaft Coal Co.	Sonman, Slope	9 x12	550
Taylor Coal & Coke Co.	Searights, No. 1	12 x27	280
Taylor Coal & Coke Co.	Searights, Slope	8 x16	825
Union Connellsville Coal Co.	Simpson, No. 1	12 x24	200
Union Connellsville Coal Co.	Simpson, No. 2	12 x24	200
Rochester & Pittsburgh Coal & I. Co.	Eleanora, No. 1	12 x28	350
Rochester & Pittsburgh Coal & I. Co.	Eleanora, No. 2	12 x20	350
Westmoreland Coal Co.	Rillton, No. 1	12 x27	350
Westmoreland Coal Co.	Rillton No. 2	12 x27	350
	WEST VIRGINIA		
Carter Coal Co.	Coalwood, No. 1	15 x29	610
Carter Coal Co.	Coalwood, No. 2	14½x23	610
Davis Coal & Coke Co.	Thomas, No. 1	12 x26	182
Davis Coal & Coke Co.	Thomas, No. 2	10 x18	178
Lake Superior Coal Co.	Dixo-Poca, No. 1	14 x20	65
Lake Superior Coal Co.	Dixo-Poca, No. 2	14 x14	62
Midland Coal & Coke Co.	Philippi, No. 1	12 x24	125
Midland Coal & Coke Co.	Philippi, No. 2	12 x24	125
New River Collieries Co.	Eccles, No. 1	12 x32	495
New River Collieries Co.	Eccles, No. 2	12 x32	525
New River Collieries Co.	Eccles, No. 3	12 x24	488
New River Collieries Co.	Eccles, No. 4	12 x24	250
Standard-Pocahontas Coal Co.	Welch, No. 1	13 x26	354½
Standard-Pocahontas Coal Co.	Welch, No. 2	12 x16	373½
E. E. White Coal Co.	Glen White, No. 1	12 x32	325
E. E. White Coal Co.	Glen White, No. 2	12 x32	325
Houston Collieries Co.	Carswell, No. 1	16 x24	315
Houston Collieries Co.	Carswell, No. 2	16 x18	319
Houston Collieries Co.	Carswell, No. 3	16 x24	253
	KENTUCKY		
West Ky. Coal Co.	Clay, No. 1	12 x26	281
West Ky. Coal Co.	Clay, No. 2	12 x26	281
	OHIO		
Provident Coal & Coke Co.	Provident, No. 1	12 x28	125
Provident Coal & Coke Co.	Provident, No. 2	12 x20	125
	INDIANA		
Bunsen Coal Co.	Clinton, No. 1	23 x13	151
Bunsen Coal Co.	Clinton, No. 2	23 x13	253
Bunsen Coal Co.	Clinton, No. 3	32 x12	277
	CANADA		
Acadia Coal Company	Allen, No. 1	12 x24	1505
Acadia Coal Company	Allen, No. 2	12 x24	1016
Dominion Coal Company	Reserve, No. 5	18 x22	200
Dominion Coal Company	International, No. 8	8 x12	369
Londonderry I. & M. Co.	Torbrook, No. 1	10 x30	180
Londonderry I. & M. Co.	Torbrook, No. 2	10 x30	180

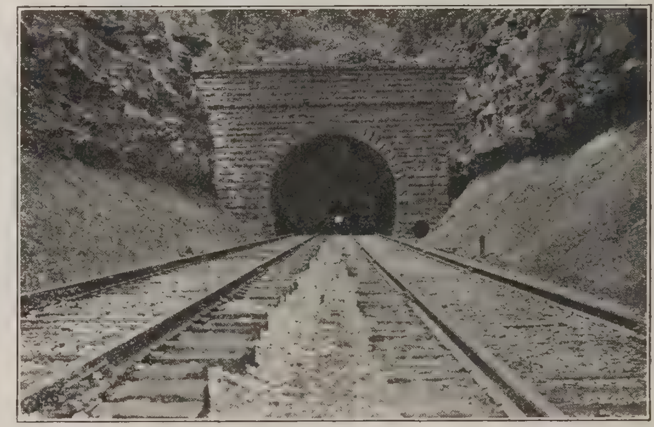
RAILROAD TUNNELS

Goulds	3,300 Ft. Long	Gould, Ohio	"Panhandle"
Laurel Hill	5,200 Ft. Long	Somerset, Pa.	South Penn.
Tuscarawas	1,100 Ft. Long	Mineral City, O.	C. & P. R. R.
Patton	1,200 Ft. Long	English, Ind.	Southern
Hog Run	800 Ft. Long	Turners, Ky.	L. & N.
Eagle	1,200 Ft. Long	Elliston, Ky.	L. & N.
Cumberland Gap	2,700 Ft. Long	Cumberland Gap, Tenn.	L. & N.

RAILROAD BRIDGES

Raccoon Arch	"Panhandle"	Raccoon Creek
Kenova	Norfolk & Western	Ohio River
Big Sandy	Chesapeake & Ohio	Big Sandy River
Cincinnati	Louisville & Nashville	Ohio River
Cincinnati	8th Avenue Viaduct	

Vetilating Shaft, Bunsen Coal Co. Universal Plant, Clinton, Ind.



No. 5 Tunnel at Goulds, O., P. C. C. & St. L. R. R.

Allan Shaft of Acadia Coal Co., Stellarton, N. S. Canada. 1505 Ft. Deep.

CEMENT-GUN COMPANY, Inc.

Main Office, S. 10th and Mill Streets, Allentown, Pa.

30 Church St., New York, N. Y,
1128 Karpen Building, Chicago, Ill.

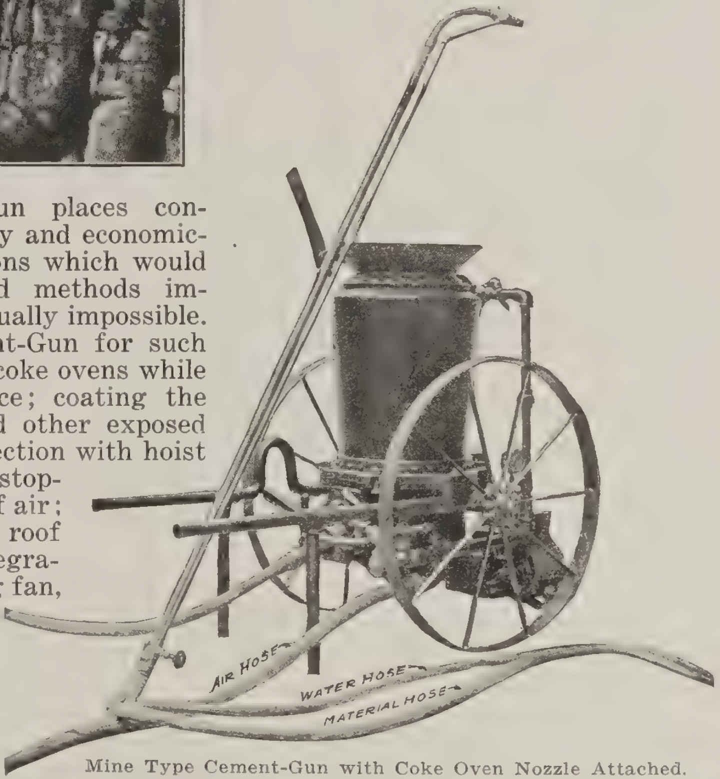
The Cement-Gun Lends Itself to A Great Variety of Uses In The Coal Field

Gunite, the product of the Cement-Gun, assures better results than can be had with hand mixed material. It is denser. The initial set takes place where it belongs; in its final resting place, and not on the mixing board. Hydration takes place in transit.

The Cement-Gun is easy to operate. It is a big money-saving proposition.

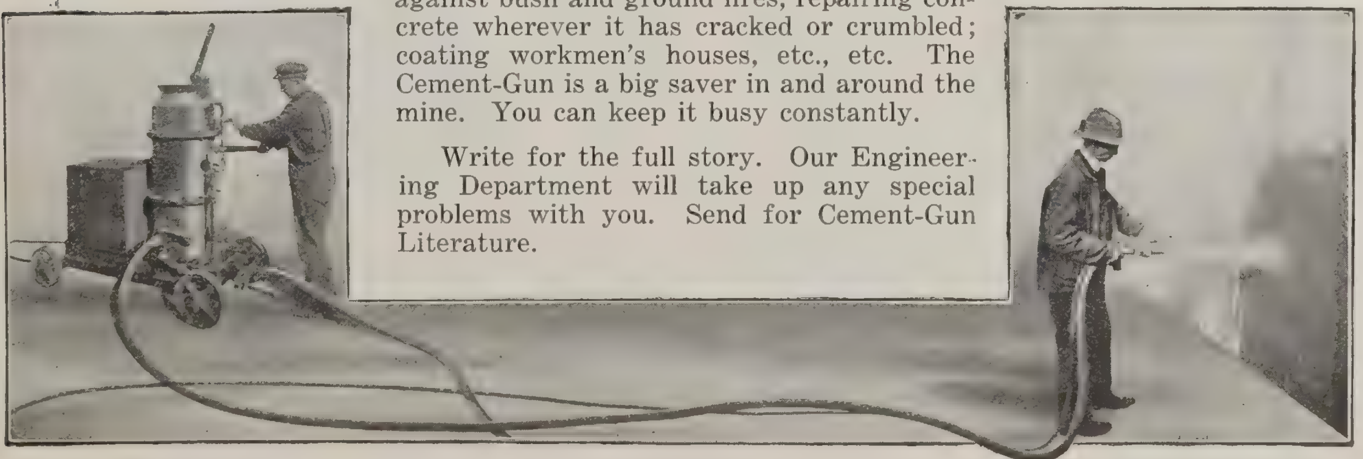
The Cement-Gun places concrete easily, quickly and economically under conditions which would make hand-applied methods impractical, if not actually impossible.

Use the Cement-Gun for such work as repairing coke ovens while they are in service; coating the buntons, pipes and other exposed steel work in connection with hoist shafts; coating stoppings to stop loss of air; coating walls and roof to prevent disintegration of rock; sealing fan, pump and shaft houses with an impervious, air-tight and fire-proof shell of Gunite; protecting power lines against bush and ground fires, repairing concrete wherever it has cracked or crumbled; coating workmen's houses, etc., etc. The Cement-Gun is a big saver in and around the mine. You can keep it busy constantly.



Mine Type Cement-Gun with Coke Oven Nozzle Attached.
Furnished with double hopper for continuous operation if desired.

Write for the full story. Our Engineering Department will take up any special problems with you. Send for Cement-Gun Literature.



BUFF & BUFF MANUFACTURING CO.

Jamica Plain Station, Boston, Mass.

NEW YORK OFFICE
50 Church Street

Manufacturers of Surveying Instruments

BUFF & BUFF MFG Co
BOSTON

Products

"Buff" Surveying Instruments; Transits and Levels.

Also, Theodolites; Tripods; Levelling Rods; Plumb-Bobs; Plummet Lamps; Steel Tapes; Range Poles; Marking Pins, and Current Meters.

Repairs to Instruments

"Buff" Transits, solidly built to resist blows and falls, have metal generously distributed throughout the construction. At the Jamaica Plain Shops, all makes are put in good order and adjustment.

Injured parts of instruments are duplicated from stock in hand. Parts to be repaired should be pointed out in detail. When so ordered, all instruments are put into "thorough order and adjustment."

Directions for Ordering

Order (especially triangulation transits) as long beforehand as possible, to insure careful construction if not in stock. State plainly style, size, kind of finish, price, shipping directions, name of express company, etc.

Permanent Accuracy

—the one thing the Engineer **must** have, is insured by the Buff experience of fifty years of successful Instrument-Making.

The Chief Engineer of a great Canadian Railway System writes us: "There is no doubt but you produce the best instrument made on the American continent."

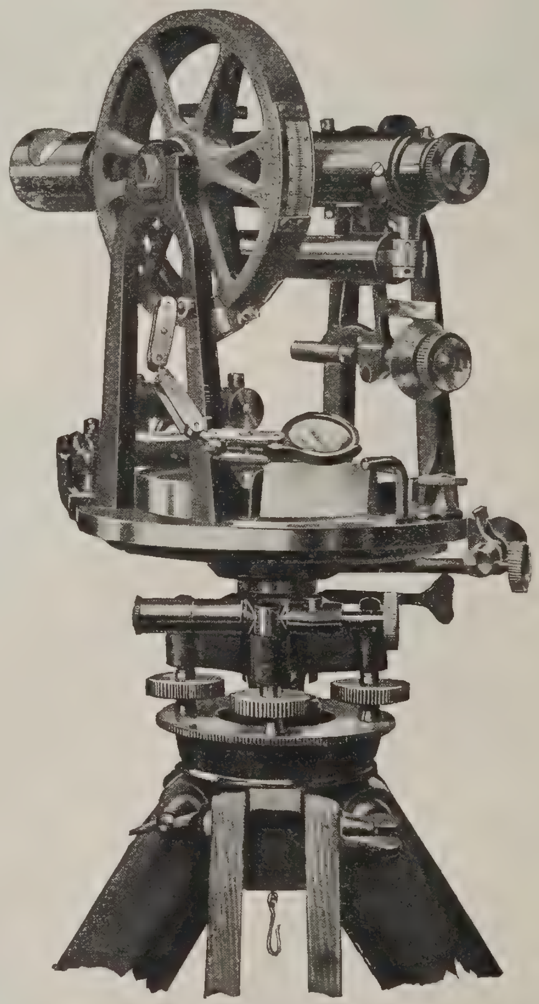
Please investigate the Buff before you purchase!

References

This company are Instrument Makers to the United States Government, many departments; N. Y. C. R. R.; N. Y., N. H. & H. R. R.; New York Water Board; Public Servicce Commission, New York City; Board of Public Works, New York City; Standard Oil Co., Guggenheim and Rothschild interests, J. G. White Co., and numerous other engineering organizations.

The Pennsylvania R. R. used "Buff" instruments in large numbers in both their North River and East River Tunnels. The Subway Commission of New York are now using 150 "Buff" instruments.

Names and addresses of experienced users of "Buff" instruments in the vicinity of any interested inquirer will be furnished on application.



The Buff Precise Mine Transit
No. 3Q. $224.

The strongest, most accurate line of Mining Instruments. All types and sizes. All the latest improvements.

Send for Catalog No. 92.

Use a Buff for Accuracy.

Davis Instrument Manufacturing Co., Inc.

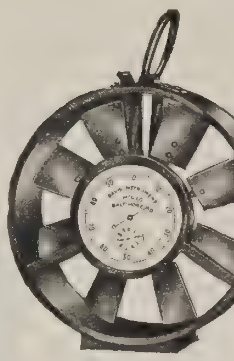
110 W. Fayette Street, Baltimore, Md.

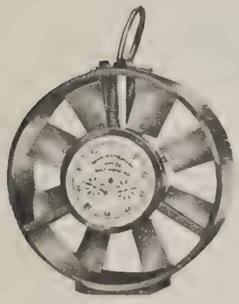
Mining and Scientific Instruments

Anemometers

Made in 3", 4" and 5" sizes.

Our Anemometers are made by the latest American machine precision methods. The object of the design throughout has been to eliminate all points that have hitherto made these instruments uncertain. All the parts are made to positive standards.





These Anemometers are exceedingly sensitive at low speeds and will stand without injury or disarrangement, velocities up to 3,000 ft. per minute.

Special high velocity instruments in any of the above patterns or readings with four vanes, that will take speeds from 1,000 ft. to 10,000 ft. per minute, same prices.

Twisted vane arms, always a source of unreliability on account of their everpresent tendency to change the calibration, have been abandoned and straight tubular spokes seccurely fastened in the adjusting hub have taken their place.

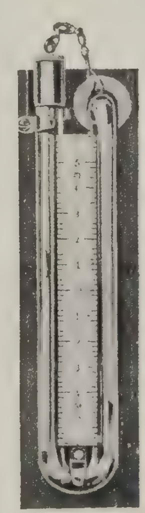
Whirling Hygrometer

For taking rapid and correct observations of atmospheric moisture.

Etched graduations on glass of extra strong thermometer tubes, which are protected by rod standards.

Dust proof, handy pocket tube carrying case.

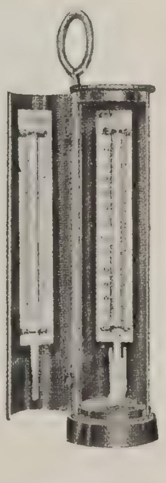
Lengths, 8" or 10". Designed for mining and other use.



Water Guages

Simplified Mine U draft, adjustable sliding scale, nozzle threaded for connections, easy to fill at cap. These are strong and inexpensive guages.

Different sizes and many styles supplied.

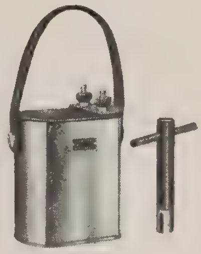


Pocket Hygrometer

In metal cylindrical closing case.

Thermometer tubes magnify and the scales are mounted on springs to lessen danger of breakage.

Humidity table with each instrument.



Baltimore Key Type Blasting Magneto

Weight 3 lbs. Fires four (4) shots at once.

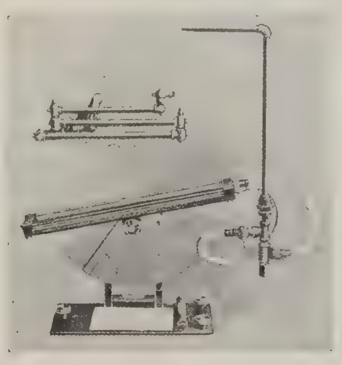
Vest Pocket Blasting Magneto

Weight 2 lbs. Fires two (2) shots at once. Operates with pull cord.

All parts dust prof; wil stand hard use; the electricity is generated from permanent magnets.

Pitot Tube and Manometer

For Blower and Fan Testing, etc. The Pitot Tube is arranged for velocities in relation to static pressures or it may be used separately, the orifice for the static pressures are small and do not admit velocities.



The Pitot tube when inserted in draft pipe may be made quite tight by a sliding threaded collar.

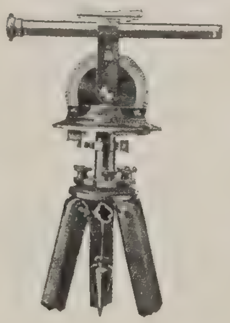
Bracket support supplied in any specified form for Pitot tests.

The inclination adjustment to the scale of the Manometer reads direct velocity feet per minute from one to ten inches of Water-Guage, and is subdivided to one hundredth of an inch by sliding scale.

Calculation tables and formula for computing low velocities and atmospheric variations are attached to the Manometer.

Baltimore Sighting Compass

Weight complete with Tripod about 10 lbs.



6" Graduated horizontal circle reads to half degrees.

Vertical circle reads to ½ degrees.

3½" Trough compass needle for locating points.

Sighting Tube is without lenses, but is equipped with adjustable cross hairs and allows excellent vision.

The horizontal to vertical arrangement for sighting is one of the most important features.

Tripod head shifts and has leveling screws.

Suitable for underground Mining practice, etc.

Circulars on application.

ALL OUR INSTRUMENTS ARE MANUFACTURED IN BALTIMORE, MD.

B. K. ELLIOTT COMPANY

126 Sixth Street, Elliott Building Pittsburgh, Pa.

Drawing Materials and Surveying Instruments

Products

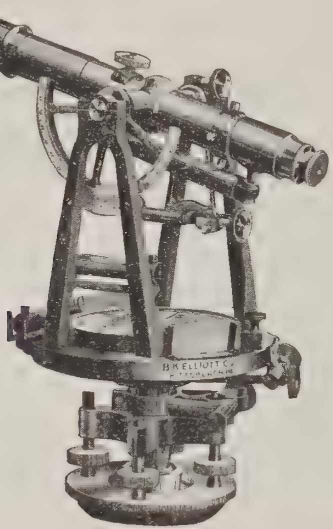
We solicit your patronage for the following high grade materials:

Drawing Boards; Drawing Tables; Filing Cabinets; Level Rods; Plumb Bobs; Compasses; Aneroid Barometers; Field Books; Detail Papers; Drawing Papers; Mounted and Unmounted Blue Print Papers and Cloths; Profile Papers and Cloths; Cross Section Papers and Cloths; Tapes; Parallel Rulers.

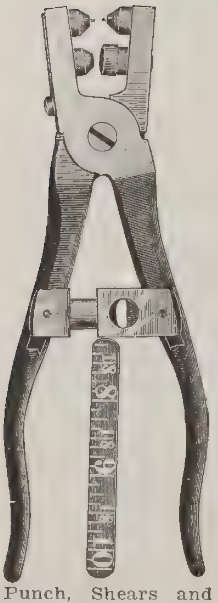
Blue Printing.

Instrument Repairing.

A Few of Our Specialties Which We Recommend



Elliott Transit No. 11008.
Price $215.00



Punch, Shears and Rivet Set No. 4119.

Punch, Shears and Rivet Set No. 4119

This tool combines the necessary features to repair steel tapes, in the shortest time and the neatest way. The punch will cut through two thicknesses of Lufkin or Chesterman Tapes or one thickness of the heavy chain tape.

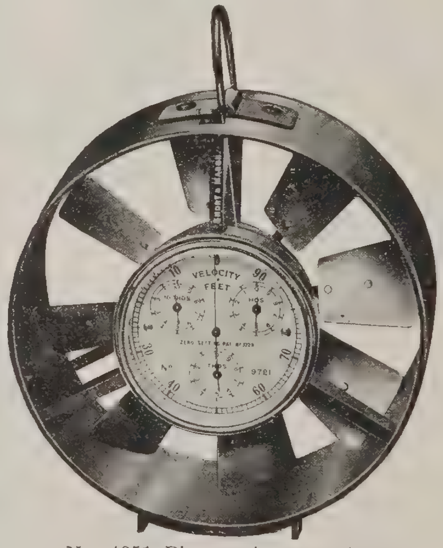
No. 4119 Combined Punch, Shears and Rivet Set, including a supply of long and short rivets, $6.00 each.

Brass Rivets; 500 long shanks and 500 short shanks, per box $1.25.

We issue a 439 page illustrated catalog, covering our entire line. Write for it today. Ask for catalog K.

We invite your inquiries.

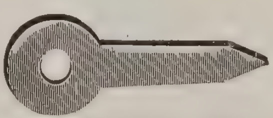
Buff Model No. 15 Transmit.
Price $248.00



No. 4251 Birams Anemometer.
4 Inches, 4 Dials Reading to 100,000 Feet.
Price $28.00

Mine Spads

No. 4114 Mine Spads 1¼ inches long, for suspending plumb bobs from timbers in mines in gross boxes, per box, 90 cents.



No. 4114.

No. 4113, 2 ins. long, for suspending plumb bob from timbers in mines, in boxes containing one gross, $1.15 per box.

No. 4113.

HELLER & BRIGHTLY

Corner Spring Garden Street and Ridge Avenue
PHILADELPHIA, PA.

Since 1870

Manufacturers of

Surveying Instruments

Products.

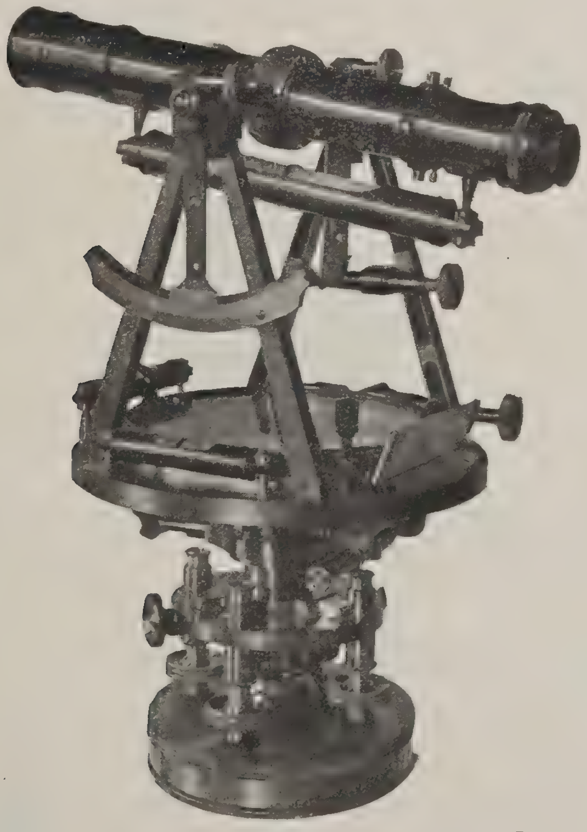
High-Grade Civil Engineer's TRANSITS and LEVELS.

General Description.

All Transits, strong and rigid, are made in three sizes; levels, in two; and are tabulated as shown in specification table. These instruments are absolutely accurate, stand up under all conditions, and adjustments remain perfect.

Special Features—Aluminum tripod head. Leveling head is detachable from instrument proper and tripod. Can be left on tripod or placed in carring box when not in use. This attaching causes no interference with adjustments, as clamping arrangement ensures a rigid union. In field, where frequent setting up is required, work is facilitated, and carring weight is more equally distributed. When two transits or a transit and level are purchased, the tripods can be made to interchange.

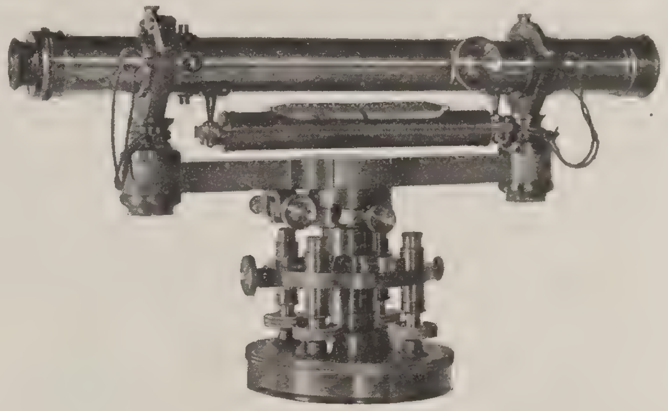
All parts accurately finished, bronzed to reduce reflection of light rays, and heavily lacquered; telescope optics, designed for high magnifying power, with plenty of light, and flat field, shows objects erect and sharply defined; stadia hairs can be moved in or out of the field of vision by micro-cross wires are focused by quick thread movement of eye piece.



Large Complete Combined Transit and Leveling Instrument With usual accessories, adjustable or fixed stadia, straight leg tripod. Price $220.00.

Graduations for transit spirit levels are made on glass; for tube of wye level, on strip of german silver over vial. All verniers, read to single minutes, gradutaed upon inlaid sheet silver.

All bearings and threads are of anti-friction metal; threads and slides are protected from dust and dampness.



18-Inch Engineers' Wye Level.
Complete with adjustable stadia and straight leg tripod.
Price $130.00.

SPECIFICATION AND PRICES—TRANSITS AND LEVELS.

	Large Transit Stock Instrument Regular $220 Complete with Tripod and Accessories	Intermediate $205 Complete	Small Mining and Reconnoissance Transit $198	18-in. Wye Level
Weight, Transit proper	12½ lbs.	8 lbs.	5½ lbs.	8 lbs.
Leveling Head (detachable)	3¾ lbs.	2 lbs.	2 lbs.	4 lbs.
Tripod, straight or split legs	6 lbs.	6 lbs.	6 lbs.	6¾ lbs.
Ready for use	23 lbs.	16 lbs.	13½ lbs.	18½ lbs.
Extension Tripod	10 lbs.	7 lbs.	7¼ lbs.	7 lbs.
Eye Piece	Erecting	Erecting	Erecting	Erecting
Magnifying Power	31 dia.	25 dia.	23 dia.	33 dia.
Diameter of Objective	1¼ in.	15-16 in.	15-16 in.	1¼ in.
Length of Telescope (reversing	12 in.	9 in.	7½ in.	18 in.
Level of Telescope	7 in.	5 in.	4½ in.	8 in.
Diameter of Vertical Circle	5¼ in.	4½ in.	4½ in.	
Length of Needle	5 in.	3½ in.	3 in.	
Compass Ring Divided into	½°	½°	½°	

Compass Ring numbered: Inside row 0° to 90° in quadrants; outside ring continuous 0° to 360°.

	Large Transit	Intermediate	Small Mining and Reconnoissance Transit	18-in. Wye Level
Diameter of Horizontal Graduated Plate	6½ in.	5¼ in.	4½ in.	

Horizontal Graduations are numbered with inside row or incline figures 0 to 360° continuous, outside row in quadrants 0 to 90°.

Above table covers features and specifications of our regular stock instruments, carried ready to ship within one to three days after receipt of order. Any special design, or figuring to graduations supplied.

PRICE-LIST OF EXTRA ATTACHMENTS.

Extension Tripod instead of regular straight round or split leg	$12.00
Half or Full Vertical Circle graduated upon silver, with double solid silver adjustable Vernier (minute reading), instead of 60° vertical arc	17.00
Aluminum Guard to full vertical circle	5.00
Disappearing Stadia Wires	5.00
Center in axis of Telescope for vertical plumbing	3.00
Half minute (30 sec.) reading to horizontal plate	10.00
Twenty second reading to horizontal plate	15.00
Ten second reading to horizontal plate	20.00
Reflector, silvered for illuminating cross wires (removable)	4.00
Prism Eye Cap	9.50
Top-Telescope (detachable) for vertical sight, in shafts	35.00
Gradientor	7.00

Above prices to be added to cost of any regular stock Transit, irrespective of size.

THE C. F. PEASE COMPANY

221 Institute Place
CHICAGO, ILLS.

Largest Manufacturers of Blue Printing Machinery

Products

Pease Peerless Continuous Blue Printing Machines; Pease-Vertical Blue Printing Machines; Peerless Blue Print Washing and Drying Machines; Drawing Materials; Engineers' Transits and Levels; Field Supplies; Blue Print Papers and Cloths; Drawing, Detail and Tracing Papers; Profile and Cross-Section Papers.

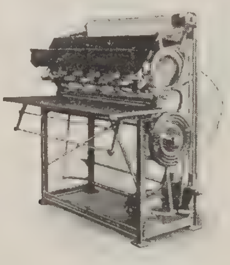
Try the Pease Gold Label Tracing Cloth and "Rigel" Tracing Paper. High in quality; Low in price.

We carry a stock of Berger's Transits and Levels, Chicago Steel Tapes and Leveling Rods, Field Books, etc.

Ask for Catalog K and sample book of papers.

Pease Peerless Blue Printing Machine

Returns tracings direct to operator's hand. Very low in operating and maintenance expense. Noiseless. All speeds electrically controlled. Lamps independently connected, only necessary to turn on a sufficient number to cover width of paper being printed.



Pease-Vertical Blue Printing Machine

(All-steel frame.)

Every machine carries the Pease guarantee for satisfaction and service. The most efficient and rapid Vertical Blue Print Machine made.

Shipped completely assembled; no danger of breakage. Made in five sizes.

Peerless Blue Printing, Washing and Drying Machine

Prints, washes and dries on either paper or cloth, blue prints, blue line prints, negative or brown line prints by one continuous operation, any length in one piece and perfectly free from wrinkles or distortions. Positive black line prints may also be made on this machine. Shrinkage practically eliminated. Floor space for entire equipment only 5½ x 6½ feet. One operator does it all. Great economizer of time and labor. Write for further particulars.

Sheet Washing and Drying Machine For Blue Prints

No wet floors. Can be placed against the wall; takes no more space than a radiator. Washes blue prints up to 42 x 72"; also blue line, negative and brown line prints.

RANDOLPH-MEANS COMPANY

Oliver Building, Pittsburgh, Pa.

Consulting Electrical Engineers

There may be several ways home, but there is only one shortest way. There may be several ways to do a thing, but there is only one best way. This evident truth applies to nothing more directly and more vitally than to the business of mining coal.

It is possible to spend $100,000 in opening and equipping a mine to produce 1,000 tons a day; or it is possible to invest double this amount without adding materially to the daily output capacity. The entire difference has to do with the wisdom exercised in the purchase of the plant equipment, it being understood that physical conditions in the two cases are the same.

This is the age of the specialist, which fact applies to everyone in every industry, from office boy to president. A man can hardly expect to master all the intricacies of finance, or to understand in minute detail the commercial phases of a great business, and yet be entirely familiar with the practical operation of a plant, the successful working of which depends wholly on engineering skill.

Innumerable failures in coal mining have resulted from defective initial plans. Oftentimes men who are able executives and efficient in their own line of endeavor have met with great trouble through their failure to recognize that the engineering and the executive, or business side of mining, are totally different. Success can only come from a full recognition that expert advice, based on long experience in the operating end, is essential to safety and efficiency in coal production.

There is but one sane method to follow in purchasing mine equipment, and that is to prepare careful plans and specifications to cover the exact article, or articles, wanted. And this is but half the job; the other half is to see that the equipment furnished is precisely what was ordered. Far from being displeased, the manufacturer of mining equipment will be glad to have definite facts, or data, to use in building the machine that is wanted. The mine manager who simply sends out a letter, stating, in a general way, his requirements, and then asking for plans and estimates, is following a line of action that is unworthy and unsatisfactory.

The average business man knows more about commercial law than he does about electricity, yet he would not consider consummating any deal or contract of any importance without the services of a lawyer. The average mine operator knows more about civil engineering than he does about electrical engineering, yet he employs a civil or mining engineer to make plans and maps of his mine.

One certain result following the submission of indefinite equipment requirements to a manufacturer is the call of a salesman; in fact, if several machinery people have been communicated with, the outcome will be a number of salesmen, each presenting to the mining company strong reasons for the purchase of their particular machine. When a large percentage of the bids received are from high-grade manufacturers it often becomes a difficult matter for the mining company to reach a decision which ultimately leads to the best economy. In many cases an apparently prudent decision proves to be the direct converse when the machine is placed in operation, whereupon the mining company is dissatisfied and the manufacturer severely criticised.

The only solution of the entire matter is effective co-operation between the mining company, through properly employed engineering skill, and the equipment manufacturers. The latter are prepared in most cases to build exactly what is wanted, if the would-be purchaser will state exactly and in detail just what is desired.

STUART, JAMES & COOKE

Charleston, W. Va.

Equitable Building
New York City

Commonwealth Building
Pittsburgh, Pa.

Electrical and Mechanical Engineers

Specialists in

The Application of Power and Equipment to Coal Mines

Consultation.
Examinations.
Reports.
Estimates.

Installations.
Power Stations.
Sub Stations.
Specifications.

Tests and Examinations

A municipal plant, or a street railway company, will have made each year a complete and accurate audit of equipment and its performance. This is even more essential in mining operations, where effective operation of the electrical and mechanical equipment is necessary to the success of the property.

It is well recognized today, with the scarcity and increased cost of labor, and the corresponding and rapid improvement in electrical and mechanical apparatus to replace labor, that such equipment has become of the first importance to every mining company, if it is to maintain its competitive position. There is every reason, then, for the work of electrical and mechanical specialists in connection with mining enterprises. This is emphasized by the fact that power costs vary 1000%, repair costs 600% and the cost of transportation 400% at different mining plants having practically the same general mining conditions.

In this test work a complete and systematic series of tests and investigations is carried out on a mining operation, through the power station or sub-station to the face of the coal, determining and checking up all power conditions and the operation of equipment. The object is to bring about savings of money or time wherever possible, to increase the speed of operation, to reduce power losses to a minimum, and in general to raise the effectiveness of the equipment.

Realizing that few engineers are qualified, through their training and experience, to undertake the investigation and improvement of the electrical and mechanical conditions applying to mining properties, this firm was organized a number of years ago primarily for this purpose.

The value of such work may be easily demonstrated. It invariably pays.

KEYSTONE
THE.
MINING
CATALOG
COMBINED WITH
COAL FIELD
DIRECTORY
CONSOLIDATED PUBLISHING
COMPANY INC.

UNIVERSITY OF ILLINOIS LIBRARY
FEB 5 - 1921

TIPPLE SECTION

Engineering Data

Inquiry data for Perforated Metal.
Inquiry data for Crushers.
Inquiry data for Scales.
Comparative Gauges Steel Sheets and Plates.
Capacity and Speed Chart of Belt Conveyors.
Capacity and Speed Chart of Bucket Elevators
Capacity of Spiral or Screw Conveyors.
Horse Power of Driving Chains.
Digest of What Constitutes a Modern Anthracite Breaker.
Horse Power Chart of Belt Conveyors.

The following manufacturers have catalogue descriptions in this section:

Allen & Garcia Co.
Anthracite Separator Co.
Cross Engineering Co.
Dempcy-Degener Co.
Dodge Sales & Engineering Co.
Elmore, G. H.
Fairbanks Co., The
Fairmont Mining Machinery Co.
General Electric Co.
Goodrich, B. F. Co.
Hendricks Mfg. Co.
Howe Scale Co.
Jeffrey Mfg. Co.
Kanawha Manufacturing Co.
Link-Belt Co.
Main Belting Co.
Malcolmson Briquet Engineering Co.
Manierre Engineering & Machinery Co.
Mashek Engineering Co.
Montgomery Coal Washing & Mfg. Co.
Morrow Manufacturing Co., The
Ottumwa Box Car Loader Co.
Pennsylvania Crusher Co.
Phillips Mine & Mill Supply Co.
Pittsburgh Coal Washer Co.
Remaly Manufacturing Co.
Roberts & Schaefer Co.
Robins Conveying Belt Co.
Scottdale Mch. & Mfg. Co.
Standard Scale & Supply Co.
Stephens-Adamson Mfg. Co.
Tamaqua Mfg. Co.
Webster Mfg. Co.
Westinghouse Elec. & Mfg. Co.
Williams Patent Crusher & Pulverizer Co.
Wilmot Engineering Co.
Winslow Government Standard Scale Works.
Wisconsin Bridge & Iron Co.

For additional descriptions of Tipple Equipment, not appearing in this section, refer to Index of Products in front of book.

Inquiry Data for Perforated Metal.

Mention the number of sheets and the kind of metal desired.

Also the size of sheets—both length and width—in inches.

If an irregular size is wanted, send a rough sketch showing shape of sheets, and on each side note dimensions.

Either send a sample, showing the exact thickness of the metal wanted, or note same by United States Standard, Brown & Sharpe's, (American) or Birmingham (English) standard gauges, of which tables are appended.

If any blanks or plain margins are wanted, mention this, and note plainly on what part of the sheet they should be.

Mention the shape and size of the perforations desired. If slotted holes, state which way of the sheet of metal you wish the perforations to run.

It is always advisable to send a rough sketch, showing the size and the shape of the sheets, the size and shape of the perforations, and which way of the sheet they run—unless they are round or square.

If designed for cylinder screens, state whether butt or lap joints are required and whether the inside or outside diameter of the screen is given.

COMPARISON OF GAUGES
FOR
STEEL SHEETS AND PLATES

APPROXIMATE THICKNESS IN INCHES, AND WEIGHT PER SQUARE FOOT IN POUNDS

U. S. STANDARD GAUGE				BIRMINGHAM GAUGE		AMERICAN GAUGE(B. & S.)	
No. of Gauge	**Fractions**	**Decimals**	**Weight**	**Decimals**	**Weight**	**Decimals**	**Weight**
000	3-8	.375	15.30	.425	17.28	.409	16.71
00	11-32	.343	14.025	.38	15.45	.364	14.88
0	5-16	.312	12.75	.34	13.82	.324	13.26
1	9-32	.281	11.475	.30	12.20	.289	11.80
2	17-64	.265	10.8375	.284	11.55	.257	10.51
3	1-4	.25	10.2	.259	10.53	.229	9.36
4	15-64	.234	9.5625	.238	9.68	.204	8.34
5	7-32	.218	8.925	.22	8.95	.181	7.42
6	13-64	.203	8.2875	.203	8.25	.162	6.61
7	3-16	.187	7.65	.18	7.32	.144	5.89
8	11-64	.171	7.0125	.165	6.71	.128	5.24
9	5-32	.156	6.375	.148	6.02	.114	4.67
10	9-64	.140	5.7375	.134	5.45	.101	4.16
11	1-8	.125	5.1	.12	4.88	.09	3.70
12	7-64	.109	4.4625	.109	4.43	.08	3.30
13	3-32	.093	3.825	.095	3.86	.072	2.94
14	5-64	.078	3.1875	.083	3.37	.064	2.62
15	9-128	.070	2.86875	.072	2.93	.057	2.33
16	1-16	.062	2.55	.065	2.64	.05	2.07
17	9-160	.056	2.295	.058	2.36	.045	1.85
18	1-20	.05	2.04	.049	1.99	.04	1.64
19	7-160	.043	1.785	.042	1.71	.035	1.46
20	3-80	.037	1.53	.035	1.42	.032	1.31
21	11-320	.034	1.4025	.032	1.30	.028	1.16
22	1-32	.031	1.275	.028	1.14	.025	1.03
23	9-320	.028	1.1475	.025	1.02	.022	.922
24	1-40	.025	1.02	.022	.895	.020	.82
25	7-320	.021	.8925	.02	.813	.017	.73
26	3-160	.018	.765	.018	.732	.015	.649
27	11-640	.017	.70125	.016	.651	.014	.579
28	1-64	.015	.6375	.014	.569	.012	.514
29	9-640	.014	.57375	.013	......	.011	.461
30	1-80	.012	.51	.012	......	.01	.408

¶ Sheet mills roll steel sheets to U. S. Standard gauge unless otherwise ordered. Plate mills usually roll heavy plates 3-16 and heavier, and light plates No. 8 to No. 12 to Birmingham gauge.

¶ In figuring weights of Steel Plates add to above the allowances for over-weight, adopted by Association American Steel manufacturers.

¶ Brass is rolled to thickness by Brown & Sharpe's American Gauge.

¶ Copper is rolled to thickness by Stubs' or Birmingham Gauge.

Courtesy of Hendrick Mfg. Co.

Inquiry Blank for Crushers.

What material do you wish to crush? ....

What is the size of the material before crushing?... ....

If Coal, from what seam does it come? ....

If Coal, is it R. O. M. or sized? ....

What size finished product is wanted?...........

What capacity, in tons per hour, do you wish to handle? ....

Is the material damp or dry? ....

What percentage of moisture does it contain? .....

For what purpose is the finished product wanted?.. ....

Inquiry Data for Scales.

Style of Scale:
Railroad Track ....
Wagon ....
Hopper ....
Tipple ....
Portable ....

Style of Beam:
Single with Weights.......................
Double with Weights ....
Tripple with Weights ....
Compound ....
Recording ....

Distance from middle of edge of platform to beam rod ....

Capacity:
Total—Dead and Live Load ....
Dead Rail ....

Platform:
Length ....
Width ....

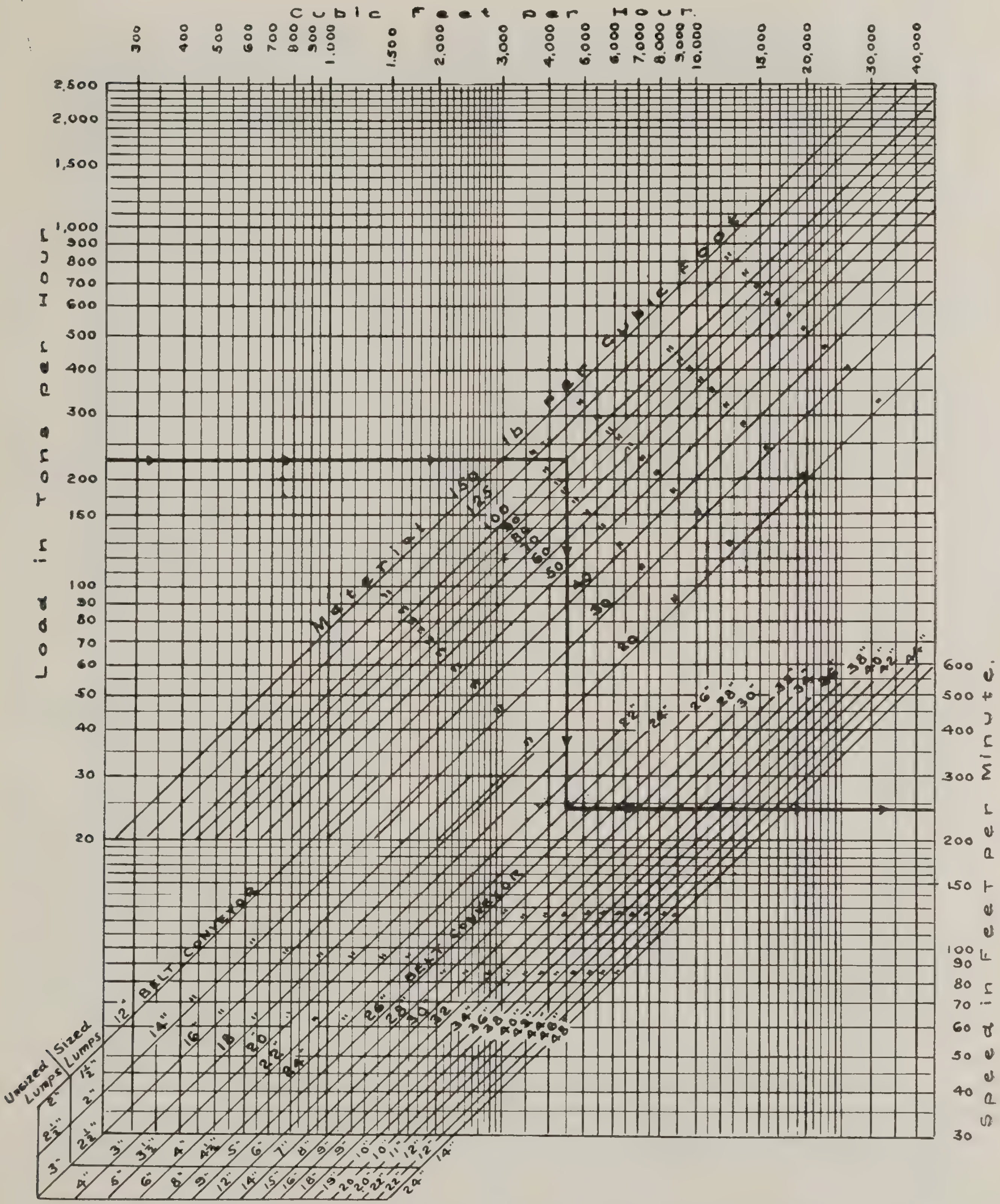
Framing:
Timber ....
Steel ....

Foundation:
Stone ....
Concrete ....

Character of soil where scale will be erected...... ....

Number of feet of straight track where scale will be located ....

Capacity and Speed Chart of Belt Conveyors

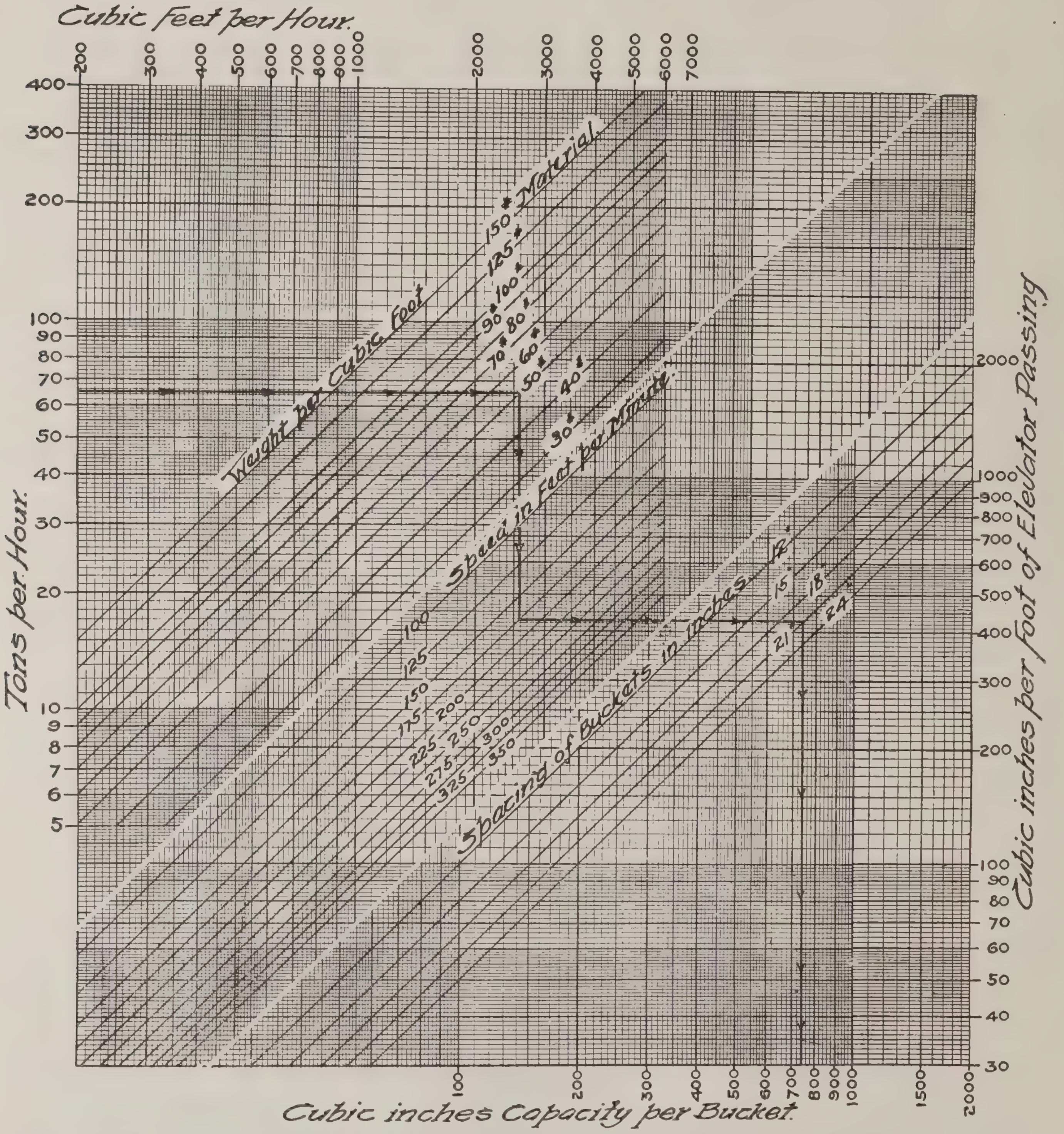


To find the width and speed of belt to move designed tonnage of given size or weight of ore, follow horizontal line of the given tonnage to intersection with one of the upper set of diagonals, then follow the vertical downward to intersection of second set of diagonals corresponding to any desired width of belt, then follow out horizontally to the speed scale, which gives speed for the belt.

Courtesy Robins Conveying Belt Co.

Capacity and Speed Chart of Bucket Elevators

Courtesy Robins Conveying Belt Co.



To find the proper size of a Bucket Elevator for a given tonnage or volume of material per hour and given weight per cubic foot:

Enter chart at left with tons per hour and follow across to diagonal line showing weight per cubic foot, thence down to diagonal line representing the desired speed of elevator, thence across to the right until the diagonal showing desired spacing of buckets is reached. At the bottom, directly below this intersection, is found the required capacity of buckets in cubic inches.

If the hourly capacity is given in cubic feet, enter at the top of the chart and **follow down** until the **desired speed line** is found, thence across to spacing, etc., as before.

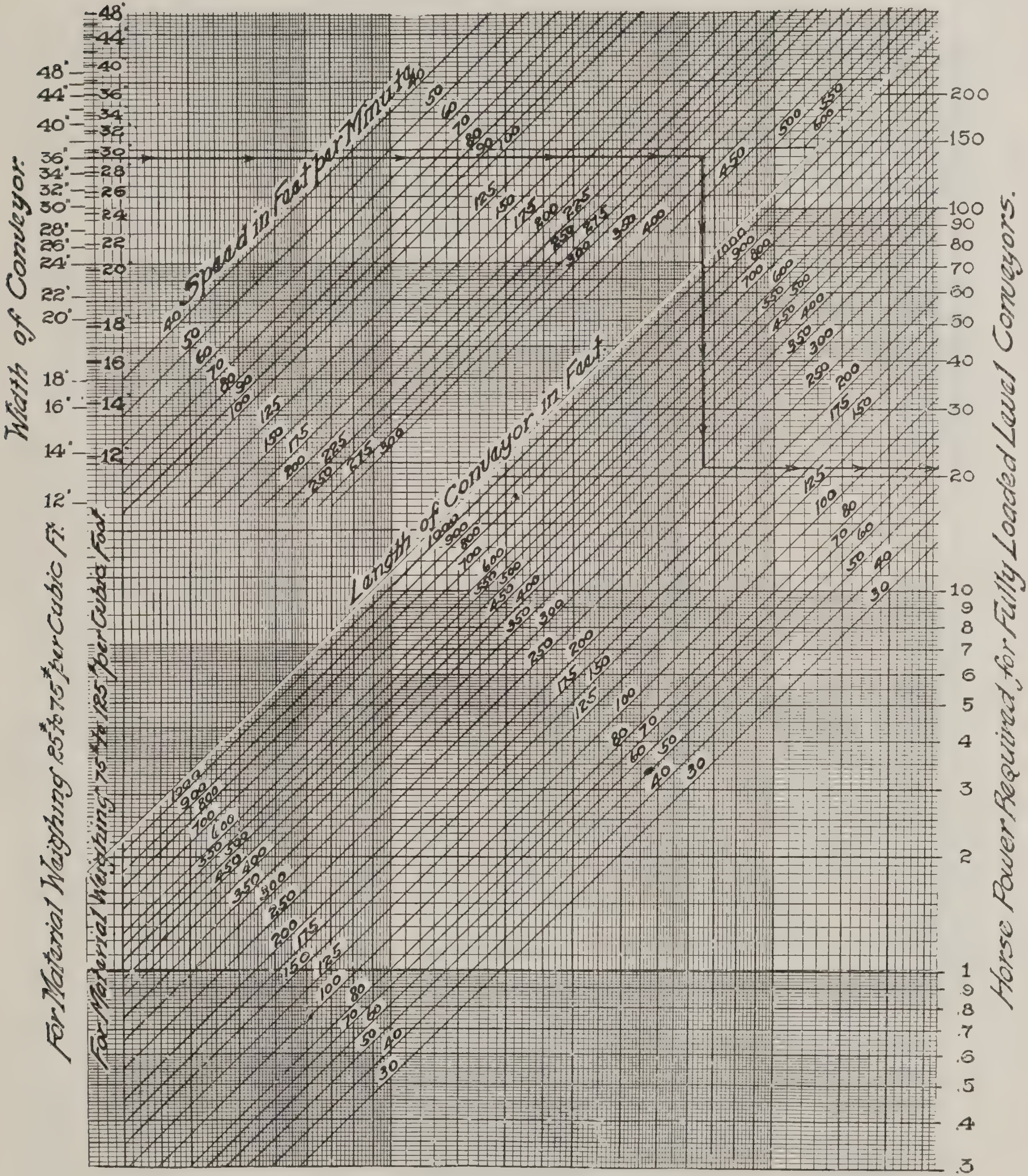
It should be borne in mind that the required bucket capacity found in the diagram is the working capacity, and somewhat larger buckets should be used, depending on conditions. It is common practice to assume the working capacities of Salem Buckets as two-thirds to three-quarters of total capacity when elevators are vertical.

The heavy line gives the solution for 65 tons of coal per hour at a speed of 175 feet per minute and a spacing of 21 inches, showing required working capacity of bucket of 740 cubic inches.

Horsepower required—To find horsepower required for driving a vertical bucket elevator multiply tons per hour by lift in feet and divide by 500. This allows for 100 per cent friction.

Horse Power Chart for Belt Conveyors

Courtesy Robins Conveying Belt Co.



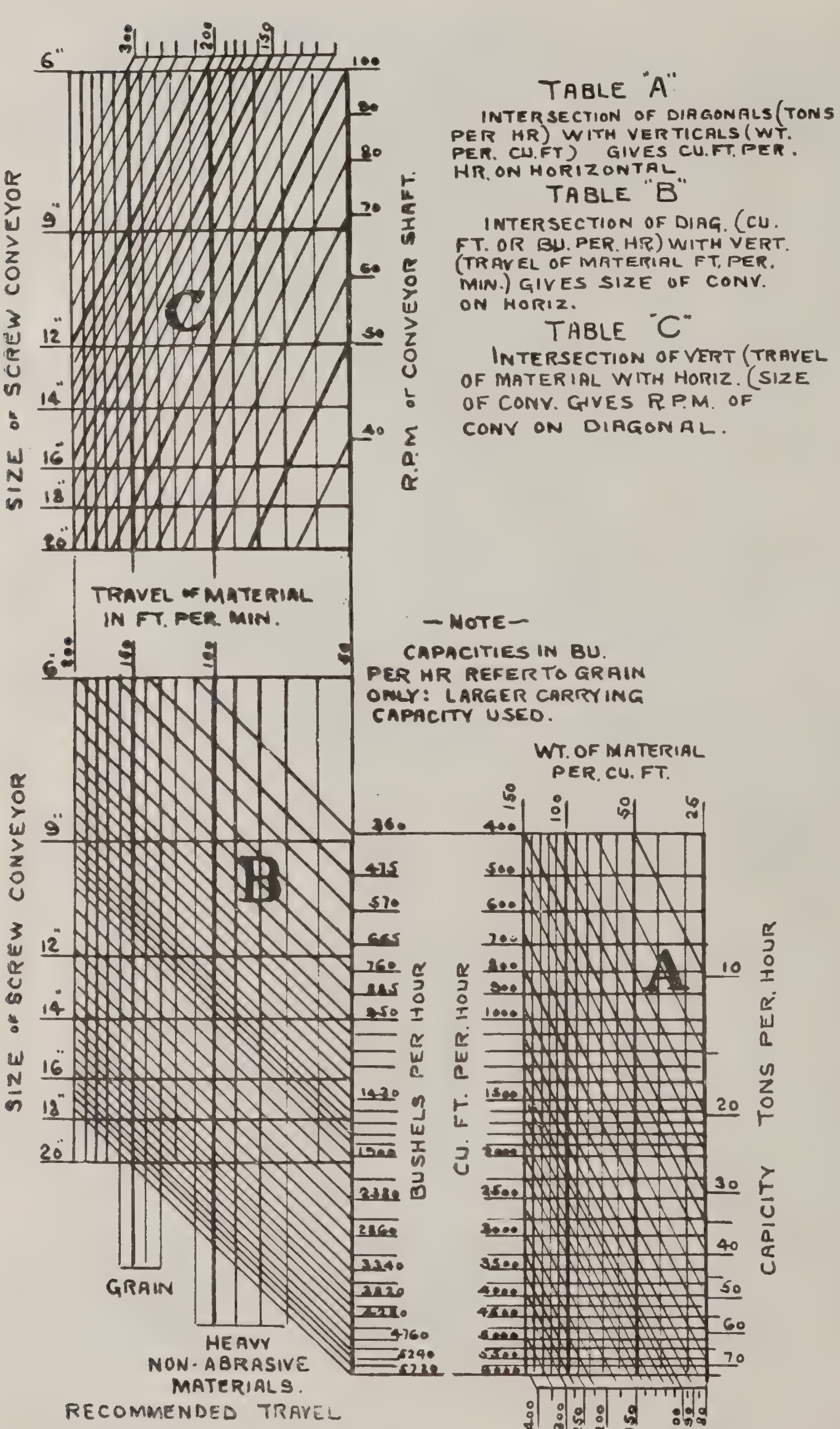
To find the Horse Power required by a fully loaded horizontal Belt Conveyor:

Select the proper width and speed of the conveyor from the chart. Enter the Horse Power Chart at the left margin, being careful to use the "width" column corresponding to light or heavy material as the case may be. From the width follow horizontally across to the diagonal giving speed of belt in feet per minute, thence down to the diagonal giving length of conveyor, thence across to the right margin where the required horsepower will be found. It is obvious that a conveyor designed to carry less than full load, will require less horsepower than indicated by the chart, but as a precaution against the possible use of a full load, we recommend that the full-load horse power be used.

The heavy line indicates the solution for a level, fully loaded, 36 inch conveyor 300 feet long, carrying material weighing not over 75 lbs. per cu. ft. at a speed of 350 feet per minute, and shown that 21 HP. will be required.

For inclined Conveyors, add one one-thousandth part of a horsepower for each foot-ton of lift per hour.

Capacity of Spiral or Screw Conveyors.



Use of Diagram

For example: Find size and speed of spiral conveyor for 40 tons of anthracite per hour. Anthracite weighs 55 lbs. per cu. ft. Starting at the right side of Section A of the diagram and following the diagonal for 40 (tons per hour) to the vertical for 55 (pounds per cubic foot), and thence horizontally to the left we read 1,500 cu. ft. per hour. Crossing to section B and following the diagonal upward into the range of travel speeds recommended for heavy non-abrasive materials, we have the choice between using a 12-in. conveyor with a travel speed of 75 ft. per minute. Here lies the opportunity for application of experienced judgment. We will use the 14-in. conveyor and the easy travel speed of 80 ft. per minute. Following the vertical for this 80-ft. travel speed up to Section C of the diagram we find, at the horizontal for 14-in. conveyor, that the necessary rotative speed is just under the diagonal for 70 r. p. m. The 12-in. conveyor at 105 ft. per minute travel-speed would require a rotative speed of 105 r. p. m. In the lower rotative speed for the larger conveyor we find compensation for its extra size and cost.

The nature of the material, the sizes of its lumps, if any, the inclination of the conveyor box, and other modifying conditions must all be given consideration in application of the diagram results to actual practice.

Horsepower—C W L plus 33,000. C equals a constant: 0.65 for coal and .0 for heavier and sticky materials. W equals weight of material in pounds per hour. L equals length of conveyor in feet.

Courtesy Robins Conveying Belt Co.

Horse Power of Driving Chains

(Webster Mfg. Co.)

Upper diagram determines speed of chain for given diameter of sprocket wheel and revolutions per minute.

Intersection of horizontal lines (dia. of sprockets) gives speed of chain on diagonal line at that point.

Lower diagram determines horse power for chain.

Intersection of vertical lines (speed) and horizontal lines (size of chain) gives horse power on diagonal line at that point.

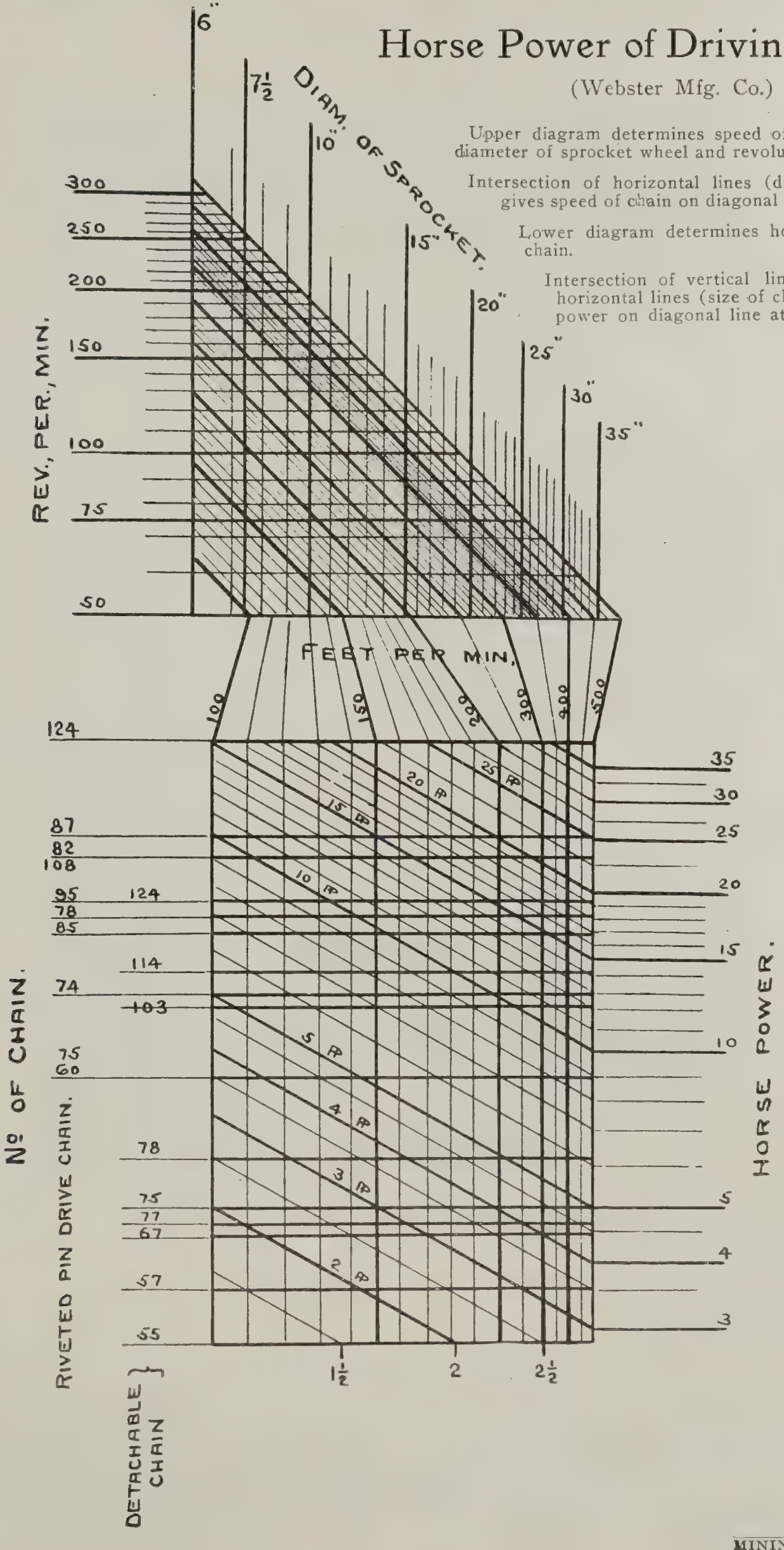
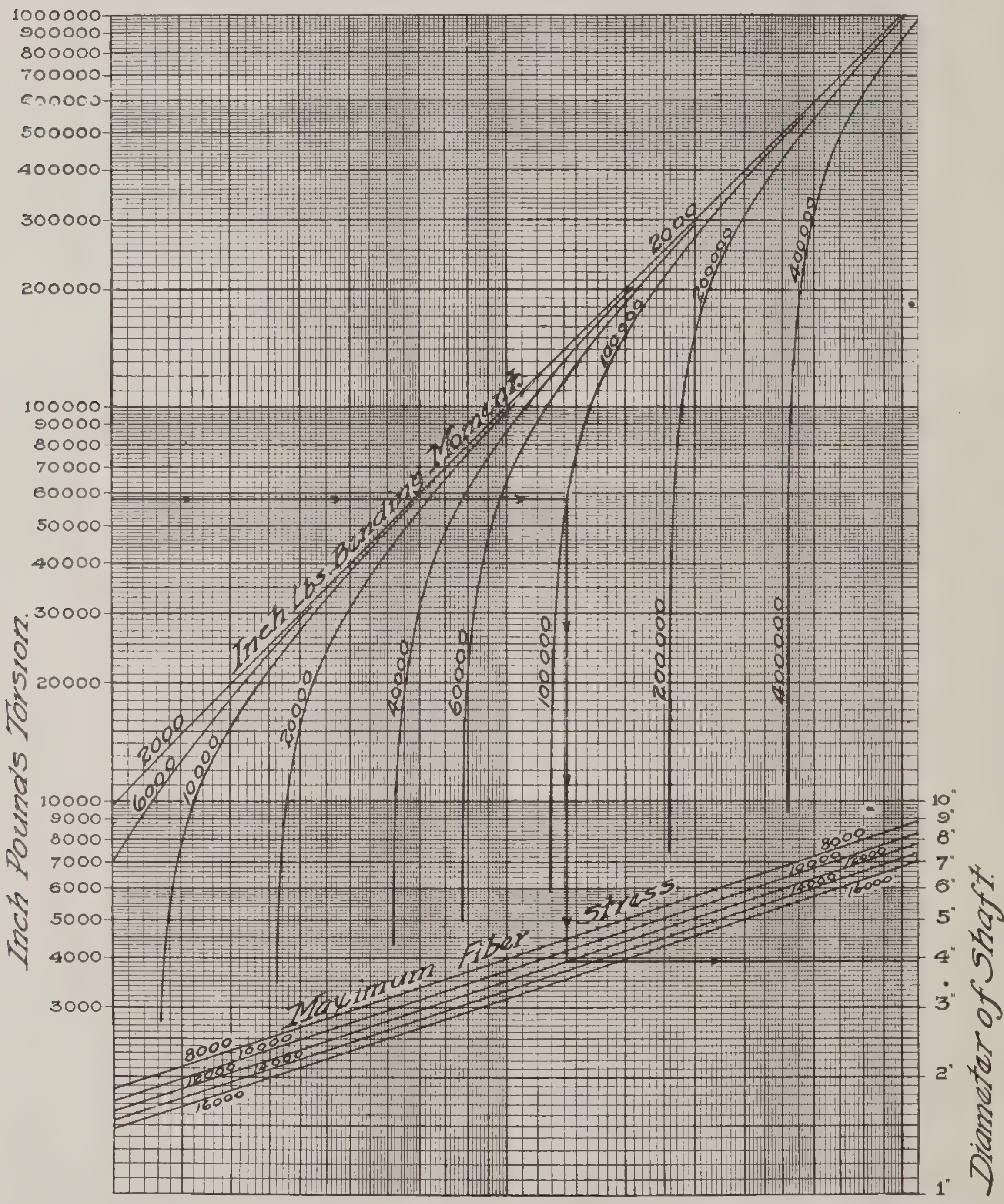


Chart for Finding Shaft Diameters for Combined Bending and Torsion



THIS chart for finding the proper size of shaft under combined bending and torsion is based on the following formula for equivalent torsion proposed by Prof E. L. Hancock and discussed by him in The Engineering Record of October 9, 1909·

$Te^2 = T^2 + 4\frac{a^2}{b^2}M^2$, in which

T = Torsion
M = Bending moment
Te = Equivalent torsion

$4\frac{a^2}{b^2}$ = Coefficient derived from relation existing between torsion and shear at elastic limit of material This coefficient has been taken as 1.66 for mild steel, as suggested in the article referred to

USE OF CHART To find shaft diameter when the torsion in inch lbs. and bending moment in inch lbs. are known: Enter at the left with the known torsion, follow horizontally until the curve representing the known bending moment is intersected, thence down to the line representing the maximum fibre stress being used, and read at the right margin the desired diameter of shaft in inches. The heavy line indicates a solution for 58000 inch lbs. torsion, 100000 inch lbs. bending moment and a fibre stress of 12000 lbs. per sq. inch, showing a 3-$\frac{15}{16}''$ shaft to be necessary. The fibre stress to be allowed is a matter of judgment with the designer. 10000 to 12000lbs. will generally be found suitable for small and ordinary sizes, but is rather higher than necessary for large sizes.

This Chart has not been published hitherto.

Courtesy Robins Conveying Belt Co.

Digest of what Constitutes a Modern Anthracite Breaker

Courtesy Kingsley & Westcott, Scranton, Pa.

The foundations of a breaker should be commenced well below the frost line to prevent any heaving in severe winter weather which would disrupt the levels and alignments of machinery contained in the building. Ordinarily a concrete or rubble wall of twenty-four inches thickness, with footings three or four feet wide and from one to two feet in depth is sufficient for the foundations, but underneath deep bins and very heavy machinery it is necessary to increase the above dimensions.

The building proper, constructed of either wood, steel or reinforced concrete, consists of one pocket or bin for each size of coal to be prepared, with a storage capacity in each of fifty tons or more and additional space sufficient for the installation of all machinery necessary for the preparation of the various sizes of coal to be marketed, and with height sufficient to allow the coal to practically run by gravity from the top of the breaker through and over the different crushing, sizing and separating devices to the pockets or bins from which it is drawn out into cars and shipped to market.

The coal from the mine is deposited at the top of the breaker in various ways. In some cases by dumping the coal into an inclined conveyor line running to the surface or sometimes slightly below the surface of ground,, to a point near the head of breaker. Or it may be taken up an inclined plane in the mine car and dumped on the head of breaker. In other cases the cars as they come from the mine are conveyed to a perpendicular hoist at the breaker which elevates the car to the desired height and dumps it immediately from the carriage, or the car is removed and dumped independent of the hoist.

In dumping the coal at the top of the building, it is usually deposited in an inclined chute of sufficient pitch to allow the coal to move out by gravity and of capacity to hold one or more mine cars of coal. In the earlier days of Anthracite mining it was customary to place series of bars called grate bars in the lower end of the dump chute. The coal passing over this chute separates the fine from the coarse material by dropping it through the bars and passing it directly to the coarser sizing screens, but this method is somewhat unsatisfactory for the reason that thin flat pieces of large size will turn on edge and pass through the bars, making an irregular sizing of the coarser coal.

In later years it is customary instead of using the grate bars in dump chutes, to narrow the lower end of chute and place one or more shaking screens below the chute with the regular round or square mesh, to allow the largest size of coal intended for market to pass through, causing all of the flat and irregular shaped pieces together with coarse pieces to pass through a set of rollers before coming in contact with the regular sizing screens. This, in general, gives better satisfaction than the bars as it separates these large, flat and irregular shaped pieces from the coarsest size of coal which would otherwise give it a bad appearance and cause it to be condemned for irregular sizing.

Between the lower end of dump chute and the heavy shakers or screens, is often placed the automatic feed of which there are several designs, to regulate the flow of coal from the chute to the screen, thereby eliminating the danger of overloading the screen with a rush of coal as is often the case when dumping coal direct from the mine car into the chute.

As the coal passes over the grate bars or off the end of the heavy shaker, the coarse lumps are deposited on what is termed a picking platform where the pieces of pure rock and slate are removed by hand and passed by various modes of transportation to the rock pile.

More or less bony coal is removed from the pure coal to be separated by hand or to be passed to separate rollers and prepared separately in the dirty side of the breaker or in an annex or washery adjoining the breaker, of which we will speak more fully later.

The picking platform usually consists of one of the two following arrangements: Either a slightly inclined chute from four to six feet in width and from twelve to twenty-four feet in length over which the lumps of coal will pass slowly by gravity and on which the rock and bony coal can easily be checked and removed by hand. Or it may consist of a traveling platform of about the same width, usually made up of two lines of metal links through which are passed small shafts or axles and on the outer ends of shafts are placed small grooved wheels. Across each pair of links is placed sheet steel plates or flights slightly overlapping each other, which are run over sprockets on two separate shafts placed from fifteen to thirty feet centers, making an endless band or platform the top of which is kept in line with the top of sprockets by means of angle iron tracks placed underneath the upper part of band on which the small grooved wheels run, while one of the shafts to which the sprockets are attached is connected with a belt or rope drive and made to revolve slowly, thus making an endless platform on to which the coal runs from lower end of dump chute or end of heavy shaker as the case may be. The coal is conveyed from this point to a point where it will run by gravity to the larger rollers.

On either side of these chutes or traveling platforms is a narrow space with the floor dropped from two to two and one-half feet below the chute or traveling platform, in which men stand and remove the pieces of rock and slate from the coal as it passes along, and throw it into chutes where it runs by gravity to some central point of conveyance to the rock bank. The men also remove pieces that are a combination of rock and coal and place it n platforms at the rear of standing space, in order to chip the coal from the rock and shovel it back on the chute or platform or pass it into a separate chute leading into a set of rolls or crushers. These crushers consist in most cases of two revolving, toothed cylinders turning in opposite directions so that the chunks of coal dropping on top of the crushers are caught by the toothed surfaces, crushed and passed between the cylinders and dropped into a hopper underneath.

Until recently it has been customary to use a single-geared crusher. That is, the shaft of each roll or cylinder is extended far enough over journal bearing to allow of placing a heavy set of cast-iron or steel pinions which mesh one into the other, while on the opposite end of the cylinders the shafts extend to allow of placing a belt pulley or rope sheave and a third bearing outside of pulley or sheave. The customary speed of this style of crusher is about one thousand peripheral feet per minute.

However, one manufacturer of crushers has of late been building a crusher with about only one-third of this speed and the tests have shown a great saving in breakage over the high speed roll. This, we believe, can be attributed largely to the fact of the higher speed, dashing the coal with so much greater force onto the hopper plates underneath crushers, thereby making a much larger percentage of culm and fine sizes of coal than when dropping it at about the natural speed of gravitation.

In order to overcome the loss of power owing to the reduced speed and the lengthening of cylinders to get the required capacity, they add a counter shaft and use a compound gear which obtains about the same results with the same amount of drive friction. From the hopper underneath these crushers, the coal passes by gravity over inclined chutes to the sizing screens.

Formerly the revolving screen was used almost exclusively for sizing the coal, but owing to the fact that in recent years there are several finer sizes of coal prepared than before, and owing to the moisture, fire clay and other sticky substances clinging to the coal as it is taken from the mine, it is impossible to prepare the finer sizes without water; and from the fact that the revolving screen is not well adapted to the application of water, it has quite generally given way to the use of the flat shaking screen, which is a saving in breakage as well as being better adapted to the application of water necessary in preparing the fine coal for market.

The shaking screen consists of two parallel side pieces placed from four to six feet apart, having pieces of angle iron bolted or riveted across underneath about every three feet, on which are bolted steel plate segments, with perforations of proper size to allow all pieces of smaller diameter than the size desired to pass through the perforations and drop onto the next deck, or to pass to another shaker with a size smaller perforation and so on until the smallest size desired has been reached. Then the fine culm passing through the perforations in the bottom deck or shaker is dropped into a water-tight hopper and is carried by the water through a slightly inclined trough or pipe to the refuse bank.

The shaking screens are placed on a slight incline with the discharge end lower than the end on which the coal is deposited so that the shaking motion gradually moves the coal over the screens.

They are usually suspended from overhead timbers by rods, chains or spring boards, although sometimes when very heavy screens are used below the dump chute for separating the fine run of mine coal from the coarse, they are arranged with axles and wheels similar to a mine car wheel, such wheels resting on short pieces of iron track, thus allowing of a shaking motion with a minimum amount of friction.

The shaking motion is attained by means of drive rods attached to the rear end or sides of shaker, leading back to a cam shaft at the rear of shaker. This shaft revolves at a speed of from 140 to 165 revolutions per minute, while the throw of the cam is usually about five inches. The shaking screens are made in one, two, three or four decks and usually hung in sets of two or more, one over the other and each set attached to separate cams on the same shaft.

The cams are so keyed on the shaft as to make one set counter-balance the other as nearly as possible, thus eliminating the strain and vibration on the building to a great extent.

Of all the numerous styled shaking screens with which we have had experience, we are most favorably impressed with the board-hung, wood-sided shaker type flexible arm or drive rod.

These rods are simply a piece of 3"x6" oak or other hard-grained wood bolted directly to the shaker sides. At a point near the end which is bolted to the side of the shaker, they are cut down to a thickness of from two to three inches for a distance of two or three feet, thus allowing the rods to spring up and down as the cams revolve and so preventing any joints at the connection of rods with the shaker from wearing and becoming loose.

As the coal leaves the sizing screens the various sides are dropped into chutes leading to the bins or pockets. Formerly it was customary to hand-pick the coal almost wholly and these chutes led directly to the bins. Seats were placed across the tops and boys stationed on the seats would pick out the rock and slate and throw it into separate small chutes which led to a refuse bin or some central point and then conveyed in cars or by a conveyor line to the rock bank.

Of late years there have been a great many mechanical devices placed on the market for separating the rock, slate and bony coal, and these do away with much of the hand-picking and cheapen the cost of preparation.

The jig, of which there are several different makes, is used almost exclusively in the southern districts of the Anthracite fields for these separations, but in the Lackawanna and Wyoming region where there is more dry preparation of coal, the gravity pickers are more largely used and in some cases a combination of the jig and gravity picker is used and this in a majority of cases gives very good results. In fact it is almost impossible to make a satisfactory separation with one single mechanical separating device for the reason that most collieries are mining from two or more different strata at the same time and the specific gravity of the material from each stratum differs greatly and the sticky substances vary, allowing some grades of coal to run much freer on the same pitch than others, thus making it impossible to adjust a single machine to suit the different conditions.

The separation of flat slate from coal which also carries a percentage of flat coal seems to be about the most difficult separation for any device yet placed on the market.

This separation is difficult for the jig for the reason that while it is heavier than the coal, bulk for bulk, it is of much flatter fracture thus giving a greater surface for the water to work on, therefore lifting about as readily as coal of the same cubical contents but of more compact form. While on the gravity picker, the surface of flat slate being so much greater according to weight, it sticks on the inclines or moves so slowly that it checks the natural flow of the coal, causing a heavy dropping of coal with the slate.

There are various angle bar and slotted plate arrangements which remove the flat material from the more compact shapes very successfully but in most cases the difficulty is that the device which will remove the flat slate will remove the flat coal as well.

A device has recently been invented to attach directly to the shaking screen which in most cases seems to give wonderful results, removing the flat slate very satisfactorily with but a very small percentage of flat coal. We believe that the most satisfactory combination of mechanical separation would be the device spoken of on the shaking screen to remove the flat slate, then pass the coal over an Emery spiral or some other device of gravity picker, adjusted to save only pure coal as nearly as could be, then pass the droppings from the gravity picker through a jig.

For the reason that the coarser sizes of coal are not always in demand, it is often necessary to rebreak the Grate and Egg sizes to Stove or Chestnut size. This requires another set of rolls or crushers than the ones above mentioned This set of rolls called merchant rolls are sometimes placed below the shaker, making the smallest size of coal to be rebroken with elevation sufficient to pass the coal as it leaves the rolls by gravity to the next finer shaker. Sometimes they are placed at a point low enough for the coal to gravitate to the rolls and then the coal is re-elevated to the sizing screens.

Still another set of rolls is usually required for breaking down the bony and impure coal as it is picked out either by hand or with mechanical devices, so that this in turn may be prepared and marketed with the finer sizes. These rolls are generally placed at a point low enough so that all pickings necessary to be rebroken will gravitate to them, and the material after passing through these rolls is elevated back to the sizing screens.

It is quite necessary in most cases, notwithstanding the various mechanical separating devices, to arrange a small space for hand-picking between the lower picker and the point where the coal enters the pocket so that any pieces of rock and slate escaping over the mechanical pickers may be thrown out and pass to the different points of disposal.

In drawing the coal through gateways from the pockets into the cars, all except the very fine sizes is drawn over lip screens, consisting of perforated or slotted steel plates, so that most of the fine material caused by breakage in the pockets and in transportation to the pockets, may be separated from the coal before it passes into the car. This screening in turn is conveyed or flushed by water to some central point from which it is again elevated to the sizing screens.

What is known as a condemned pit is sometimes dug underneath the loading track and usually near the center of the breaker.

Over this pit are placed the cars of condemned coal and the coal drawn out. From this pit the coal is again conveyed and elevated back to the sizing screens from which it again passes through the different modes of separation, thereby doing away with shoveling and handling in the car.

The power for operating the machinery in the breaker is usually steam although of late a number of breakers are run by electricity. The engine or the electric motor, as the case may be, is generally placed underneath or at a point just outside the breaker from which the power is conveyed by belt or rope drive to a main shaft at some point in the building and from this main shaft and the needed counter shafts, separate belts or rope drives are run to the various machines throughout the breaker.

At some collieries they have a double breaker for the preparation of the coal where one side prepares only the pure lump coal from the run of the mine, while the other prepares the fine and the bony material. In this case the pure coal side is usually operated without water while for the side preparing the fine and the dirty coal water is generally used. In a double breaker the coal of the same size from each side is run into the same pocket and to overcome the bad appearance caused by mixing the wet and dry coal together, it is thoroughly washed on the lip screens when being loaded.

At other collieries they have a washery independent of the breaker into which all of the dirty and fine coal is conveyed and prepared. In such instances it is loaded independent of the main breaker. The same washery is sometimes used for handling over the old refuse banks which were accumulated in former years and in which remains a good percentage of pure coal.

ALLEN & GARCIA COMPANY

McCormick Bldg. Chicago Ill.

CONSTRUCTING ENGINEERS

W. P. Rend Coal & Coke Co.
Herrin. Ill.

West Kentucky Coal Co.
Sturgis, Kentucky.
(3rd Repeat Order.)

Middle Fork Mining Co., Benton, Ill.

The Modern Way to Build a Coal Mining Plant.

Entrust it's design and construction to an **Engineering Firm.**

The Allen & Garcia Co. is thoroughly prepared through long experience to render this service.

We have an organization of experts covering all branches of Engineering connected with Coal Mines—Civil, Structural, Mining, Electrical, Power, Mechanical.

Our Employment Means:

1st. No more haphazard design and construction. No more expensive failures.

2nd. Thorough Study of conditions and requirements, in the light of our experience in many mining fields.

3rd. Systematic and Efficient Designs arranged both for present and future needs.

4th. Carefully drawn plans and specifications for Machinery and Equipment that will stand up and "deliver the goods" under hard service and handle your product at minimum cost.

5th. Purchase of all construction materials and equipment on competitive bids, based on plans and specifications. **By this method only is it possible to purchase the best materials at the lowest prices.**

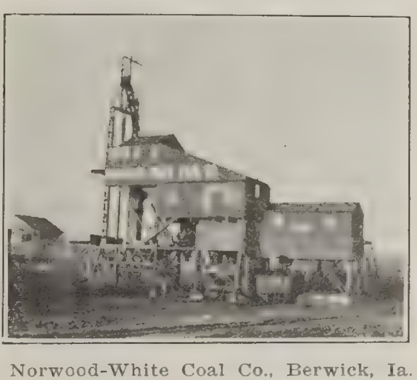
6th. Responsibility for each Unit fixed under definite, enforceable conditions. **Our own responsibility for the general working of the plant.**

7th. Construction under supervision of our trained and experienced Engineers—Each unit put in satisfactory operation before we leave the job.

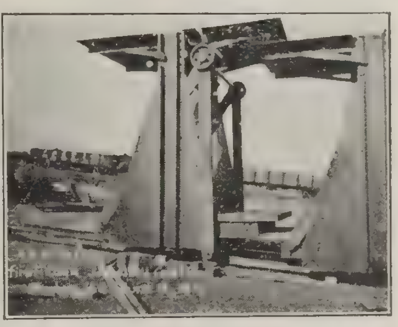
8th. Complete co-operation between your organization and our own. Every one working for the good of the job.

Our compensation—Cost plus fee or Percentage.

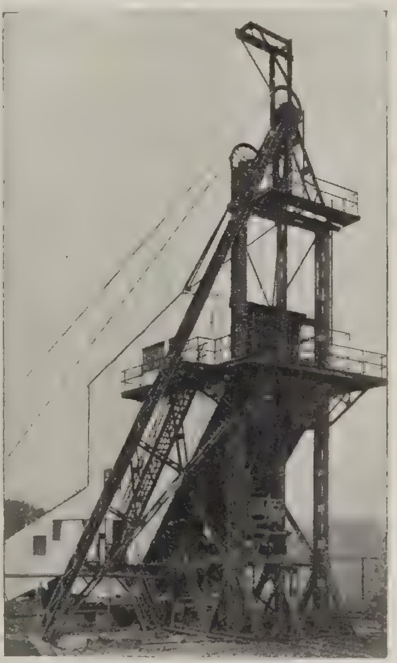
We Are Builders—Not Bidders.



Norwood-White Coal Co., Berwick, Ia.
(Repeat Order.)



A. & G. Safety First Dumping Cage.



Brazil Block Coal Co., Clinton, Ind.

Our Specialties

Examinations and reports on Coal Properties.

Design and construction of complete plants and their various units.

Tipples—Rescreeners—Washeries.
Power Plants—electric and steam.
Mine Wiring—transmission and haulage.
Operation of Plants.
Mine Development.

Our Specialties

Balanced Crank Driven A & G Shaker Screens, designed on scientific principles for perfect preparation and operating for not over ½ the power usually required.

Picking Tables with A & G Counterbalanced Electric Hoist.

A & G Head Frame (Pat.) Economical and stiff.

A & G Self Dumping Cage—the best on the market.

FAIRMONT MINING MACHINERY CO.

Standard Equipment.

- Tipple Structures
- Screens and Chutes
- Loading Booms
- Picking Tables
- Conveyors—all types
- Cable Car Hauls
- Chain Car Hauls

General Offices and Works

FAIRMONT, W. VA.

TRADE MARK REGISTERED
FAIRMONT
101-20

(The Mark of Quality.)

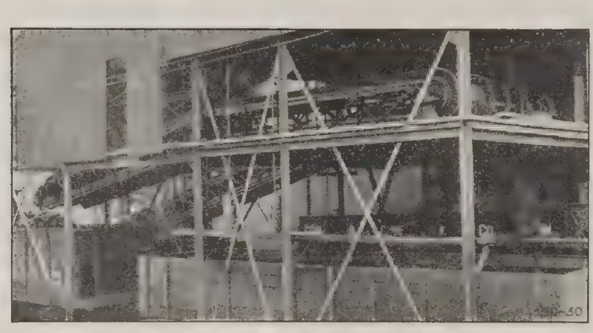
Specialties

- Steel Mine Ties
- R. R. Car Retarders
- Portable—
- Electric Mine Pumps
- Power Coal Augers
- Box Car Loaders
- Mine Car Trucks

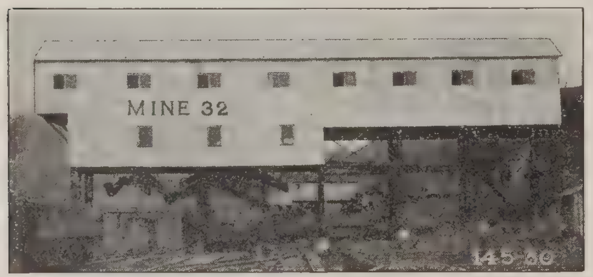
COAL MINE EQUIPMENTS

Fairmont Steel Tipple and Complete Screening and Loading Boom Equipments are designed and built to meet all conditions for the best possible preparation and loading.

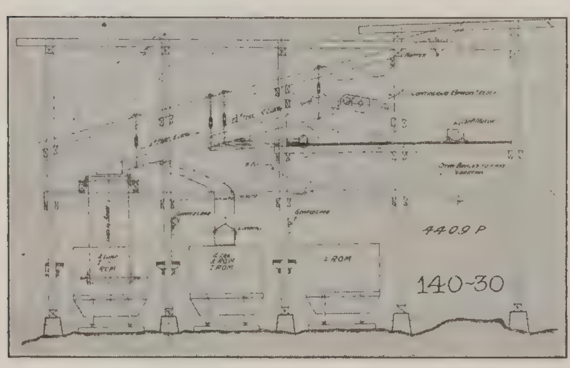
We will gladly furnish information as to where any of the following plants can be seen in operation. Our Engineering Department is at your service.



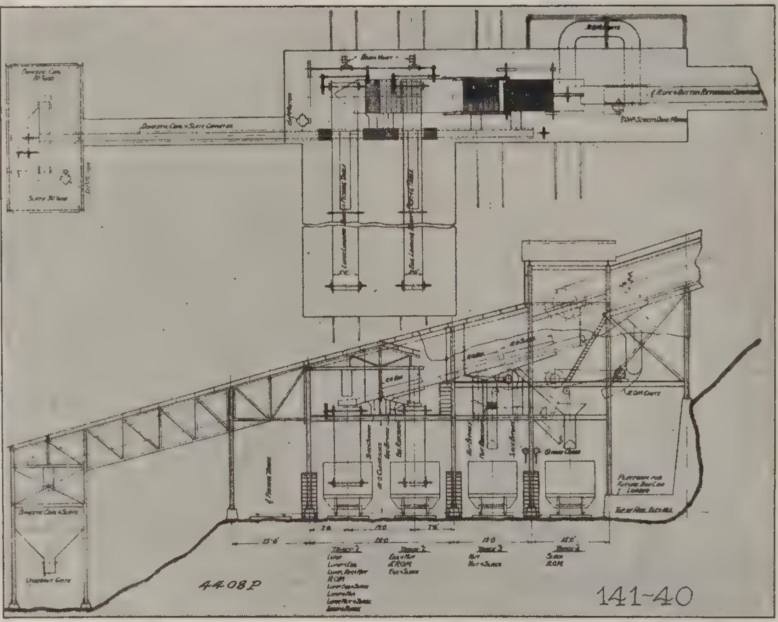
Double Loading Boom and Picking Table Equipment on which Coal can be efficiently cleaned and loaded without breakage. This installation is at one of the mines of the Davis Coal & Coke Co.



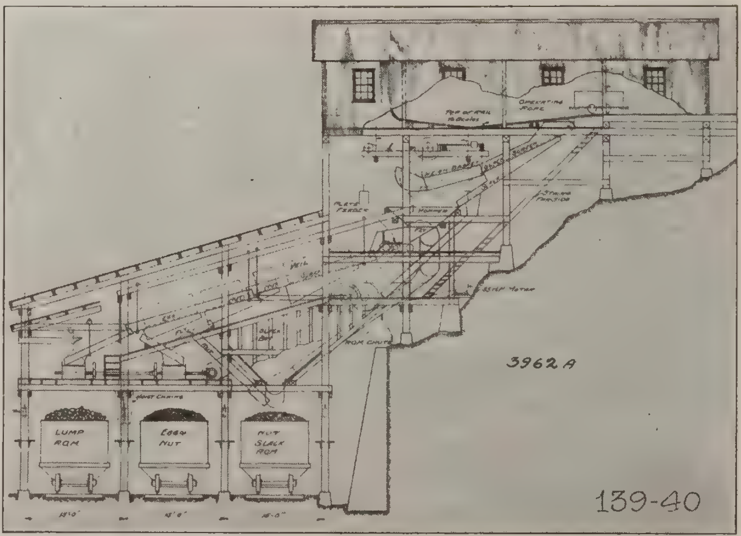
Complete Steel Tipple and Screening Plant installed for the Consolidation Coal Co. at Owings, W. Va. Capacity 250 tons per hour.



Typical Screening Plant, equipped with Feeder and Lump Loading Boom. Capacity 250 tons per hour.



Steel Tipple fed by Retarding Conveyor of the Rope and Button type with run of mine By-Pass Chute, Balanced Shaking Screens, both lump and egg Picking Tables and Loading Booms and domestic coal and Refuse Bins. Capacity 300 tons per hour.

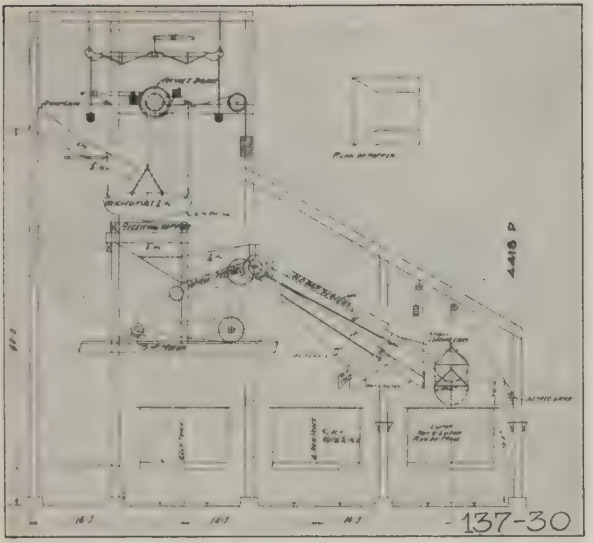


Tipple equipped with Weigh Basket, Apron Feeder, Shaking Screens and Lump and Egg Loading Booms. Capacity 250 tons per hour.

TRADE MARK REGISTERED
FAIRMONT

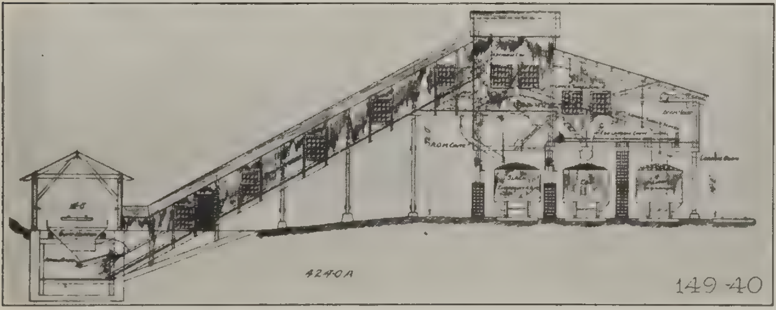
Coal Handling Equipment

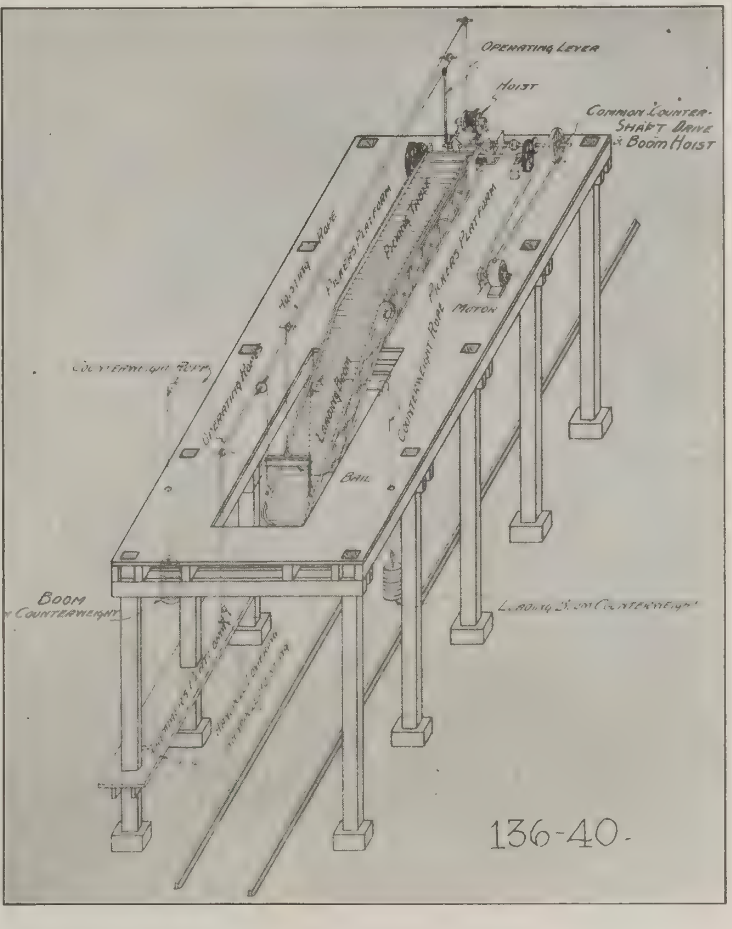
TRADE MARK REGISTERED
FAIRMONT



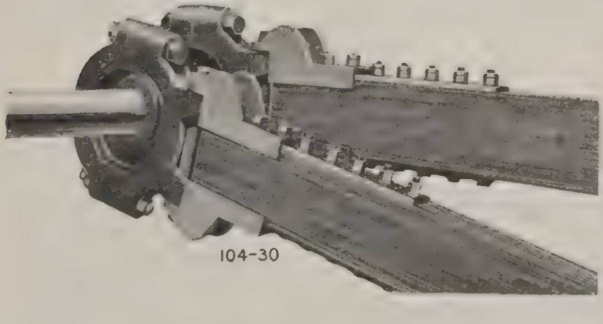
Tipple equipped with run of mine Weigh Basket, Receiving Hopper, Apron Feeder, Gravity Screens, and Spiral Adjustable Round Bottom End Loading Chute. This equipment is supplied to many mines which are changing screened to run of mine basis where the height of dumping point is limited.

When the coal seam is on the level of the railroad track, or below, the lay-out below is used with great economy. The coal is dumped into a hopper and fed onto a pan conveyor, which may serve as a picking table, which elevates it and delivers to the shaking screens in the tipple, where it is carefully sized and the lump loaded by our loading boom.

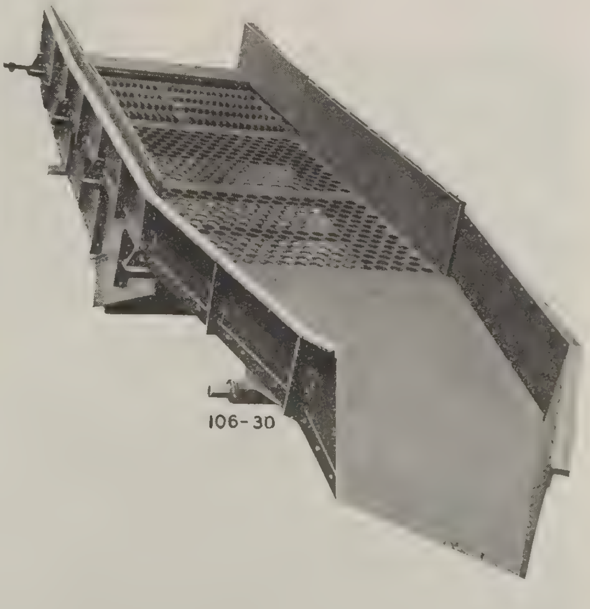




This illustration shows the detail of our Picking Table, Loading Boom and Boom Hoist. The operating lines are controlled from the trimmer's platform.

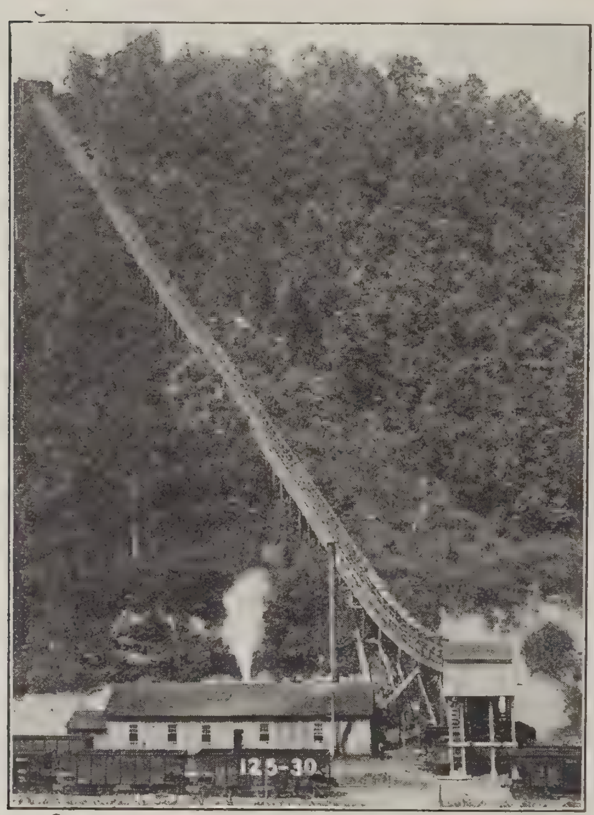


Shaking Screen Eccentrics showing our hinged pittman connection which releives the eccentric of all lateral stresses due to the swinging of the screen. The other end, not shown, we provide with a ball joint for the same purpose.



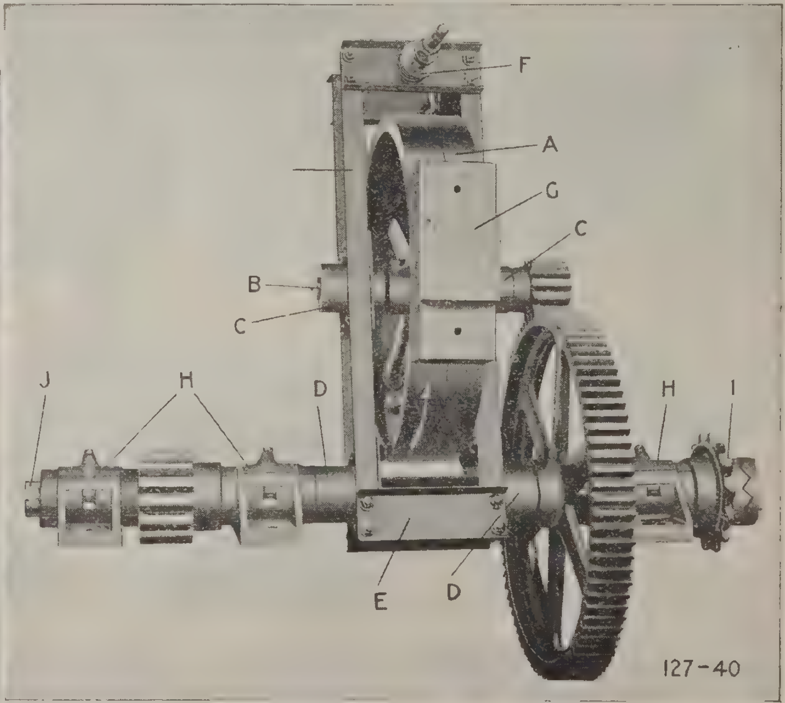
Lower leaf of Shaking Screen showing both perforated and lip screens and also our bevel nose discharge which lays the coal, well distributed, without breakage on the loading boom.

Coal Handling Equipment



ROPE AND BUTTON TYPE RETARDING CONVEYOR in the Elkhorn Field in Kentucky, 1000 feet long which handles 250 tons per hour. This conveyor is entirely automatic, requiring no labor to operate other than an occasional oiling. A view of the lower strand of the conveyor is shown below. When occasion demands this trough may be filled to the top of the sheet iron, and the conveyor will slowly ease the coal down the hill without breaking or grinding, the moving coal supplying almost all the power necessary.

In order to make the operation of our retarding conveyors absolutely automatic, we employ our patent Automatic Brake, shown below. The motor driving the conveyor is belted direct to the pulley (A), which drives the conveyor through the pinion and gear (C), (D). The brake block (G), which is attached to the framing of the tipple, does not engage the pulley (A) while the motor is driving it, but when the conveyor tends to drive the motor the frame (E) moves about the shaft (J), causing the pulley (A) to engage the brake lock and effectually prevents the conveyor from running away. The action of the brake is absolutely automatic, and relieves the motor of all load when no power is required to run the conveyor.



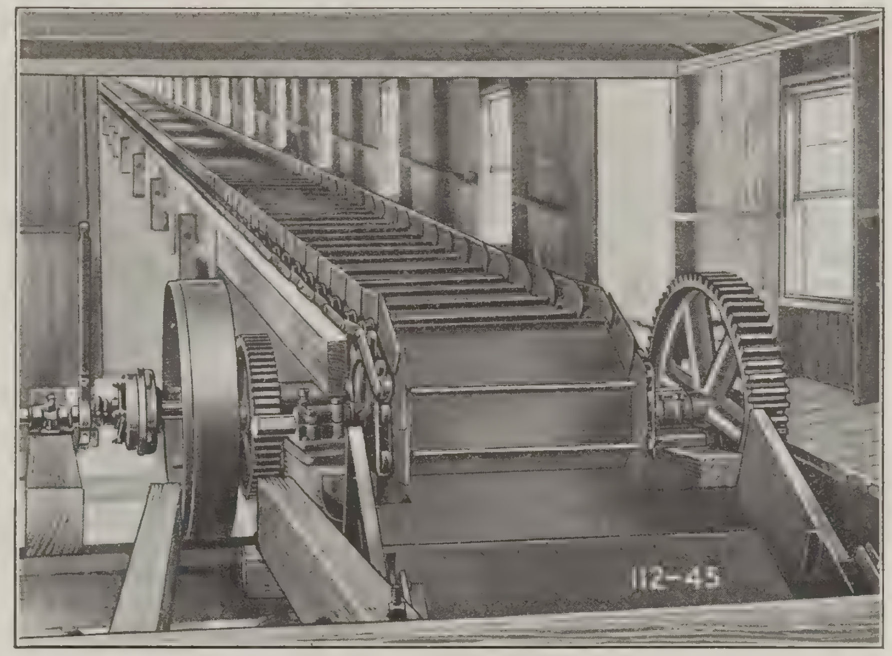
TRADE MARK REGISTERED **FAIRMONT** 101-15

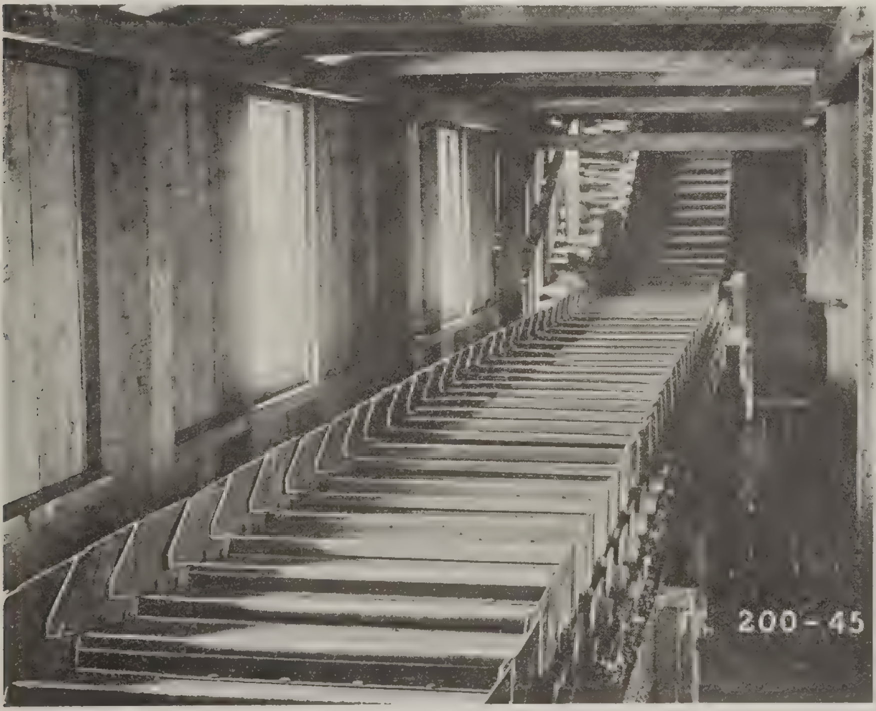
Coal Handling Equipment

TRADE MARK REGISTERED **FAIRMONT** 101-15

OUR APRON CONVEYORS, 6-inch, 8-inch, 12-inch and 18-inch Pitch Chain and Pans, any width, are designed to meet all conditions where this type Conveyor is desirable—for Picking Tables, Loading Booms (or combination of both, (Apron Feeders or long Conveyors), for elevating the coal or lowering it to the tipple.

This Conveyor illustrated has been in continuous service more than seven years with practically no expense for repairs. Runs easily and does not break the coal.

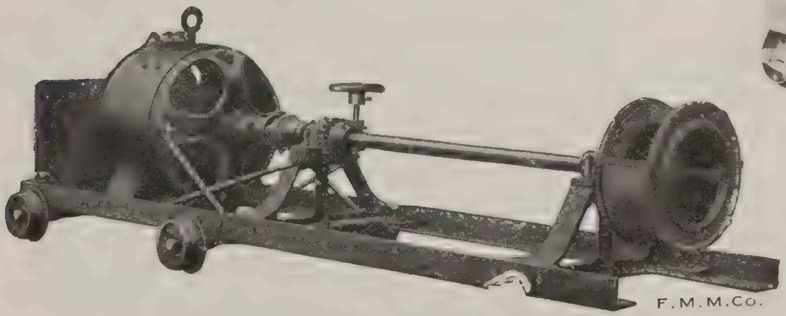




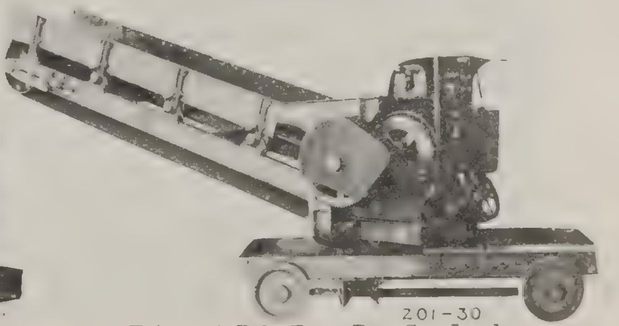
Apron Retarding Conveyor.

This type of Apron Retarding Conveyor is installed where the length is not great and the slope of the Conveyor is flat. It is supported on self-oiling wheels and chains having case-hardened steel bushings, which greatly increase its life. It runs noiselessly and is frequently designed for capacities up to 400 tons per hour. This type is especially efficient where a combination Conveyor and Picking Table is desired.

OUR BOX CAR LOADERS are either the rotary or belt type, for handling slack or lump coal. The rotary type has a capacity of one ton per minute and will load anything you can put into it. The belt type will handle material with minimum breakage, and is used successfully in loading lump coal, gypsum, rock salt, etc.



18″ Long Box Car Loader—7½ or H. P. Motor.

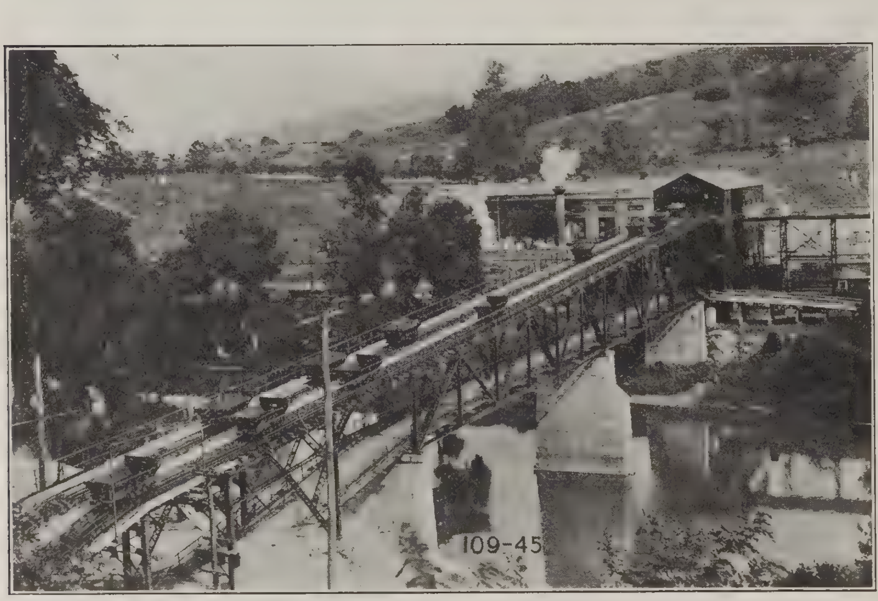


Fairmont Belt Type Box Car Loader.

TRADE MARK REGISTERED FAIRMONT

Car Hauls

TRADE MARK REGISTERED FAIRMONT



This is a Fairmont Rope Type Car Haul at the Consolidation Coal Co. Mine No. 84, Hutchinson, W. Va. It is operating on a maximum slope of 14° and 626-foot centres. It has a capacity of 158 cars per hour.

The above is a rope type Fairmont Car Haul at the Marion Gas Coal Co. plant at Bingamon, W. Va. It is 450 feet long, 14 per cent grade and delivers three cars per minute.

The Fairmont Mine Car Hauls are employed in elevating the loaded coal cars from shallow slopes to the dumping point of the tipple or for letting them down short inclines where the coal seams are above the railroad.

These car hauls work automatically picking the cars up at the bottom and detaching them at the top, or vice versa, and are designed for enormous outputs, when necessary. Our specialty along this line is making machinery absolutely dependable. All parts are made exceedingly strong and heavy to give long life and uninterupted service.

Fairmont Car Hauls are of two types: one design employing a long pitch chain, the links of which are replaced at intervals by carriages running on wheels and provided with dogs to engage attachments fastened to the bottoms of the cars.

The other type uses a heavy iron centre steel rope, to which are bolted at intervals attachment blocks running on rollers and provided with dogs, similar to those used in the chain type of haul.

The illustration opposite is of the rope type, showing the car—engaging the attachments at B, the carriage having rollers only, at C and E. The device marked A is a "grass-hopper" designed to prevent the loaded cars running back down the slope, should one become disengaged.

Railroad Car Retarder

No modern tipple is complete without **Fairmont** Railroad Car Retarders to handle the railroad cars while loading.

Safety

Regardless of snow, sleet, rain and bad brakes the railroad car is always under the absolute control of the responsible man.

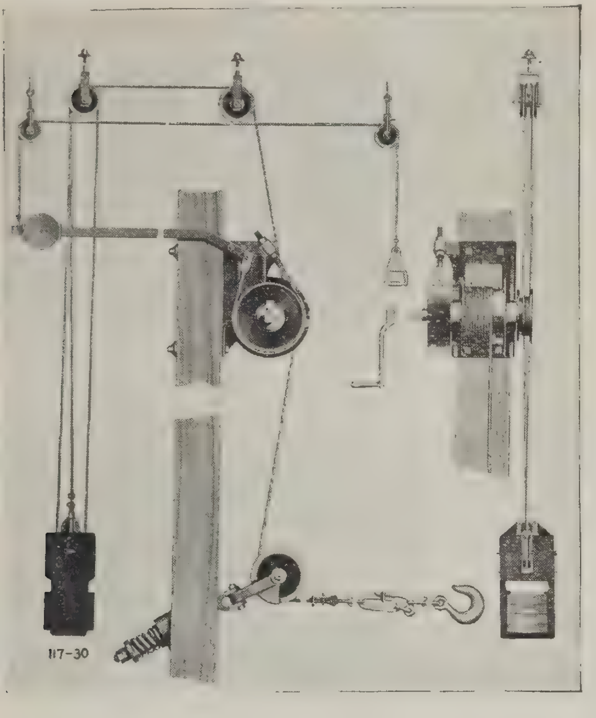


Fig. 1—General Assembly.

Economy

At least one man may be relieved in practically all cases, representing a profit on the investment of over 300% per year.

Efficiency

Cars moved accurately, quickly, and easily result in better and cheap trimming and a marked reduction in breakage.

General Description

Figure 2 shows a Retarder installed on a wooden tipple—the Retarder on one post and the guide sheave on another post.

Figure 1 shows assembly of Retarder on one post, and very often this is an independent post placed just above the tipple for the purpose.

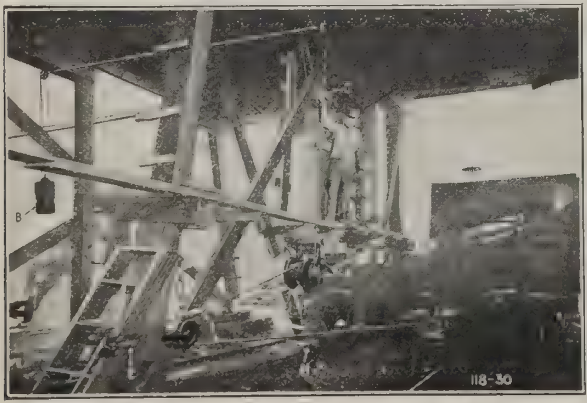


Fig 2—Retarder installed in Tipple.

In Figure 2, A is small drum on main shaft for counterweight line; B is counterweight; C is hand hold on line to brake lever; D is brake lever with counterweight for tightening brake band; E is double buffer spring to take shock off of post and Retarder when cars are stopped; F is main drum on which main line that hold cars is wound; G is guide sheave for main line; H is crank for winding main line on drum in case anything should happen to automatic re-winding attachment; J is brake wheel and brake band.

All parts are amply strong to withstand the strain when starting and stopping cars. The main rope is ⅝″ plow steel, giving maximum strength for the size.

Method of Operation

For the most successful operation the track should have enough grade (about 2½%) so cars will run without being barred or pushed. When the first car is lowered to the upper end of tipple the hook on end of main line is attached to car at most convenient point on front truck. Car is then dropped down to loading point by pulling hand line "C," which raises brake lever "D" and releases brake, allowing car to go forward as far as desired. The car is stopped by releasing hand line, which allows weight on brake lever to apply the brake. As the car is loading this operation is repeated several times, lowering the car a few inches at a time to keep coal up against loading chute or boom. When car is lowered to point where main line is about all off the drum, the hook is released from car the counterweight "B," which has raised as the main line comes off the drum, drops down, reversing the motion of drum and automatically winding the main line back on drum, in position to attach to next car.

The counterweight "B", and hand hold "C", for operating brake, can be carried to any convenient point by means of small sheaves provided for the purpose; and if desired the Retarder can be operated from two or more different locations.

Safety First

Eliminate the possibility of injury to your men by installing Fairmont Retarders and keep your men off the car brake.

Showing two Retarders on one post.

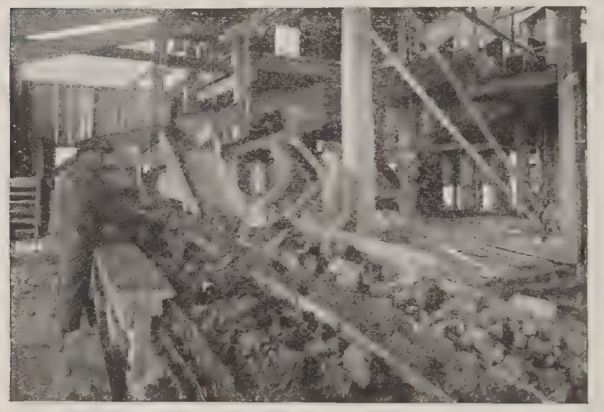
THE JEFFREY MANUFACTURING COMPANY

Main Office and Works: 962 North Fourth St., Columbus, Ohio

SALES OFFICES:

New York.............50 Dey Street
Boston..............141 Milk Street
Philadelphia. Real Estate Trust Bldg.
Pittsburgh......Farmers Bank Bldg.
Scranton, Pa..Union Nat. Bank Bldg.
Broadwell, O........H. H. Townsend
Middlesboro, Ky..Middlesboro Hotel
Charleston ....West Virginia
Chicago ....McCormick Bldg.
St. Louis...Railway Exchange Bldg.
Milwaukee............M. & M. Bldg.
Denver....First National Bank Bldg.
Seattle............L. C. Smith Bldg.
Birmingham......Brown-Marx Bldg.
Dallas..........................Commonwealth Nat. Bank Bldg.
Canadian Works ....Montreal

Coal Picking Tables and Adjustable Loading Booms



Jeffrey Picking Tables are made with Single, Double, or Treble Compartments, as illustrated.

INTERIOR VIEW OF TIPPLE SHOWING DELIVERY END OF PICKING TABLES

Illustrating how the Jeffrey Adjustable Loading Boom is lowered, **not dropped,** to the bottom of railroad car.

The Delivery of a Perfect, Prepared Product free from Slate and Excessive Breakage, Means Better Selling Prices, Satisfied Customers, and an Increased Demand for Your Coal.

JEFFREY PICKING TABLES AND ADJUSTABLE LOADING BOOMS are indispensable in the solution of the Coal Treatment Problem.

The **Jeffrey Double Beaded Flight Conveyor Type of Picking Table** permits the hand removal of all slate and similar impurities at a minimum of expense.

These conveyors are built in sizes and widths to suit conditions and capacities of large and small mines—and can be easily installed in old tipples.

The **Jeffrey Loading Boom** enables you to load clean coal to railroad cars with the least breakage and cost. Furnished in lengths and widths to meet conditions.

Ask for Bulletin No. 45-62, fully illustrating and describing these equipments.

Jeffrey Picking Tables are furnished complete ready to run, or we will furnish Steel Aprons with or without supporting structure or driving machinery.

THE JEFFREY MANUFACTURING COMPANY

Elevating and Conveying Machinery For Coal Tipples and Washeries

"Scraper Type" Conveyor, with Steel Roller Chain with Large Steel Reinforced Flights, handling Run-of-Mine Coal from Dump House to Tipple Building.

Double Beaded Flight Conveyors used for Lump and Egg Picking Tables.

We build complete Machinery Equipment for the Handling and Preparation of Coal.

Continuous Type Bucket Elevators.
Steel Apron Carriers.
Rubber Belt Carriers.
Double Beaded Flight Conveyors.
Chain Scraper Conveyors.
Chain and Cable Flight Scraper Conveyors.
Valves and Spouts—Feeders.
Loading and Unloading Devices.

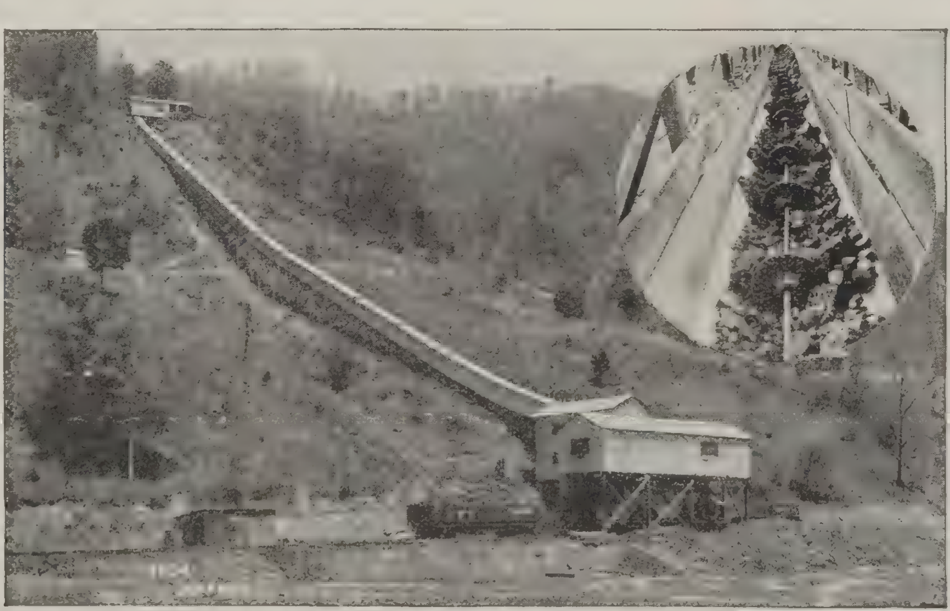
Accessories for Elevating, Conveying and Power Transmission Machinery; including Chains and Attachments; Sprocket Wheels; Malleable and Steel Elevator Buckets; Elevator Boots and Casings; Hoppers; Pivoted Buckets; Steel Pan Buckets; Pulleys, Hangers, Bearings, etc.

Ask for copy of General Catalogue No. 84.

Twin Dewatering Perforated Bucket Elevators, giving perfect discharge, each having a capacity of over 125 tons per hour.

Rubber Belt Conveyor handling Run-of-Mine Coal from Mine Entry to Tipple.

Cable Retarding Conveyor 428 feet long; capacity 200 tons per hour. Operates at a peed of 100 feet per minute.



Showing how the Rope and Discs travel with the coal in a V-Shaped Steel Trough, the return strand being carried back on a curved plate overhead.

The Jeffrey Cable Conveyor solves the problem of lowering coal over great distances and heights from drift mouth to tipple and loading tracks, with minimum expense and breakage.

These conveyors are especially adapted for and have been installed to accommodate greater lengths and capacities than any other type.

Write for new Bulletin picturing and describing many installations.

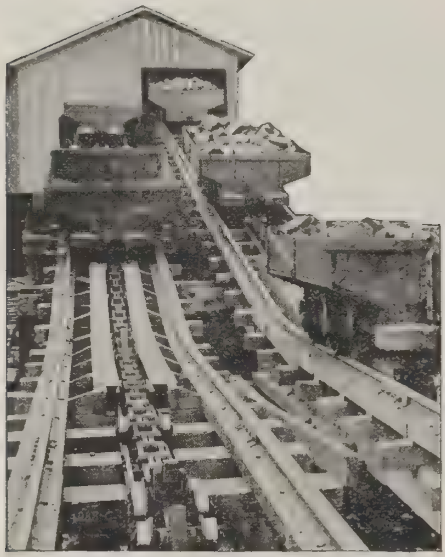
THE JEFFREY MANUFACTURING COMPANY

Main Office and Works: 962 North Fourth St., Columbus, Ohio

SALES OFFICES:

New York..............50 Dey Street
Boston..............141 Milk Street
Philadelphia. Real Estate Trust Bldg.
Pittsburgh......Farmers Bank Bldg.
Scranton, Pa..Union Nat. Bank Bldg.
Broadwell, O........H. H. Townsend
Middlesboro, Ky..Middlesboro Hotel
Charleston ....West Virginia
Chicago ....McCormick Bldg.
St. Louis...Railway Exchange Bldg.
Milwaukee............M. & M. Bldg.
Denver....First National Bank Bldg.
Seattle............L. C. Smith Bldg.
Birmingham......Brown-Marx Bldg.
Dallas..........................
..Commonwealth Nat. Bank Bldg.
Canadian Works ....Montreal

Car Hauls---Screens---Chutes

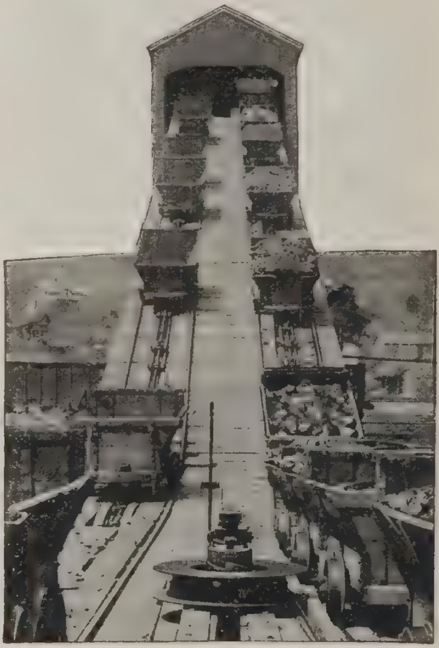


Jeffrey Chain Car Hauls are extensively used for single cars, and also trip haul-ups in and at the mines.

Jeffrey Cable Car Hauls

When adapted to long slopes with large terminal curves and Jeffrey Sheaves;—the Smooth Running, Flexibility and Small Power Consumption of this type commends itself as the ideal type for continuous haulage of cars.

Submit us outline of your local conditions, sketch of cars and statement of maximum capacity requirements; also request **Special Car Haul Bulletin No. 21-62.**



Jeffrey Cable Car Haul with Tilting Spurs and Rollers handling four cars per minute. A single endless cable both elevates and lowers cars.

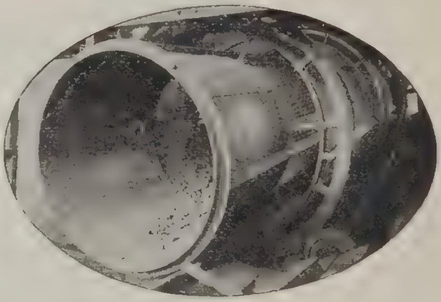
Coal Tipple Screens and Chutes

Made-To-Order from Designs and Specifications furnished to us, or from our Standard Equipments.

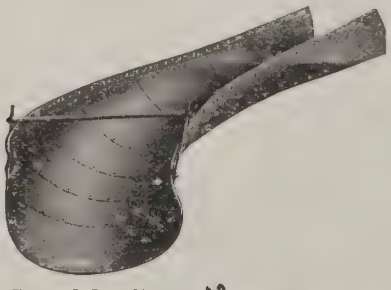
End Dump Weigh Basket making delivery. Notice the uniformity of coal distribution across the Shaking Screen.

Conical, Cylinder and Hexagonal Revolving Screens

of Wire Cloth or Perforated Metal, with Single or Multiple Screening Surface, also furnished. Write for Screen Bulletin No. 69-B.

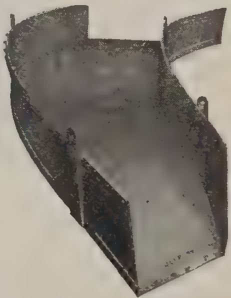


Tandem of Shaking Screens, with Adjustable End Loading Chute, for loading direct or by curved chute into cars.



Curved Loading Chute; Curved Bottom.

Tapered Chute.



Curved Loading Chute; Straight Bottom.

LINK-BELT COMPANY

PHILADELPHIA CHICAGO INDIANAPOLIS

Complete Equipment for the Handling and Preparation of Coal

New York...............299 Broadway
Pittsburgh.........1510 Park Building
Boston..................49 Federal St.
St. Louis...Central National Bank Bldg.
Buffalo............698 Ellicott Square
Wilkes-Barre..2nd National Bank Bldg.
Detroit...........732 Dime Bank Bldg.
Seattle.........580 First Avenue South
Portland, Ore.....14th and Lovejoy Sts.
Los Angeles.....161 N. Los Angeles St.
Denver.......Lindrooth, Shubart & Co.
Minneapolis...........418 So. Third St.
Knoxville.................D. T. Blakey
Cleveland.......1304 Rockefeller Bldg.
New Orleans, C. O. Hinz.............
.................Hibernia Bank Bldg.
San Francisco, N. D. Phelps.........
.......................Sheldon Bldg.
Birmingham.....General Machinery Co.
Louisville, Frederick Wehle, Starks Bldg.
Toronto...Canadian Link-Belt Co., Ltd.

Products

We design and build complete Coal Tipple Equipment, Coal Washeries, Retarding Conveyors, Rescreening Plants, Shaking Screens, Picking Tables, Loading Booms, Chutes, Automatic Coal Driers, Locomotive Cranes, all types of Elevators and Conveyors, Transmission Machinery, Electric Hoists, Etc.

Catalogs will be sent to interested parties on request.

No. 111—The Handling and Preparation of Coal at the Mine.
No. 165—Coal Tipples, Retarding Conveyors, Etc.
No. 120—Peck Carrier for Coal, Ashes, Etc.
No. 79—Belt Conveyors.
No. 106—Hoisting and Conveying Machinery.
No. 200—Transmission Machinery.
No. 125—Link-Belt Silent Chain Drives.
No. 158—Locomotive Cranes.
No. 160—Retail Coal Pockets.

The success of Link-Belt Machinery is due to the fact that each equipment is designed by our experienced engineers, manufactured throughout in our own shops under their direct supervision, and erected by our own erecting corps, insuring personal supervision from the beginning to the completion of the work, and one responsibility.

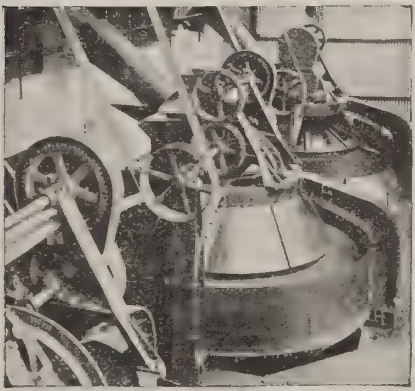
Our three large manufacturing plants at Chicago, Indianapolis and Philadelphia are equipped with the most modern machinery for the fabrication of the structural work for steel tipples, screening equipments, chutes and all machinery necessary for handling and sizing coal.

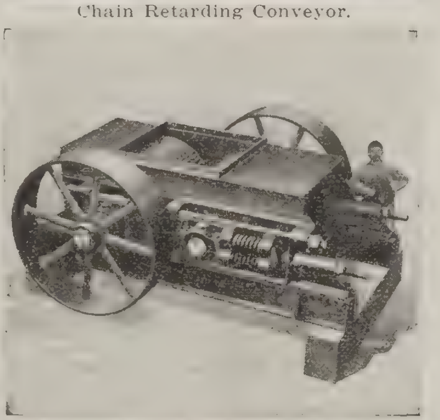
Our engineers are prepared to offer their services for the solution of all engineering problems. We are always pleased to send representatives, upon request.

Steel Coal Tipple.

Chain Retarding Conveyor.

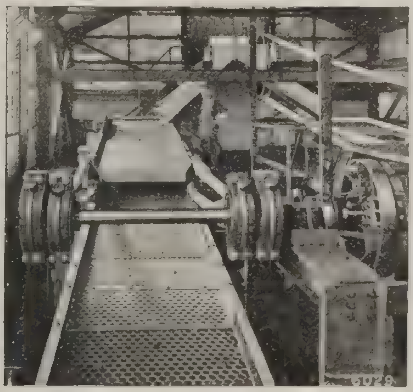
Coal Washery at Berwind, W. Va.

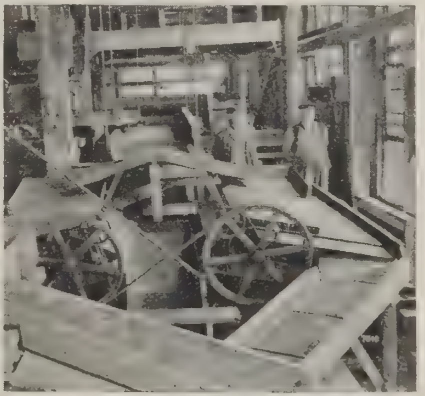

Wendell Centrifugal Coal Drier.


Crushers for All Kinds of Coals.

Picking Table.

Loading Boom.

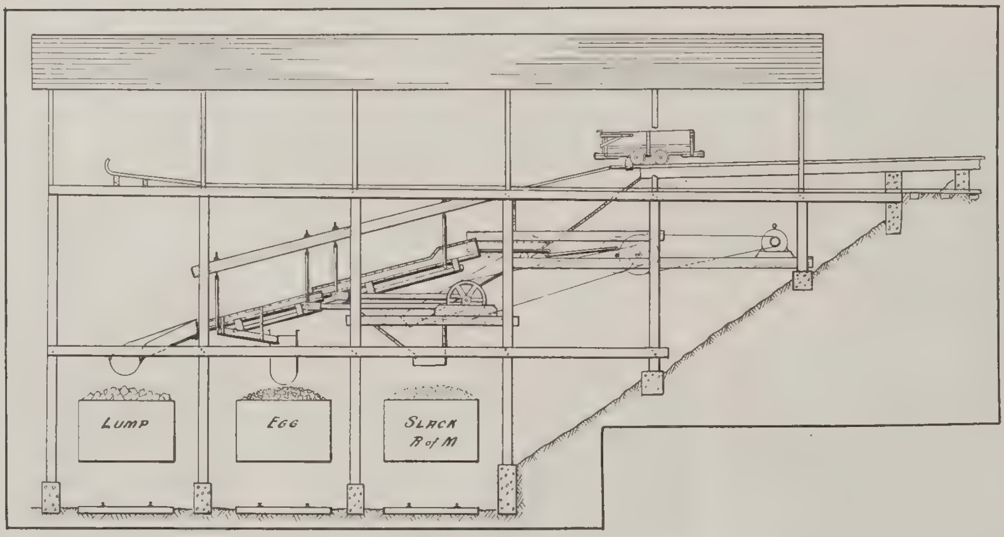

Spring Leg Shaking Screen.


The Ayres Separator for Removing Slate from Anthracite and Bituminous Coal

KANAWHA MANUFACTURING CO.

CHARLESTON, W. VA.

Kanawha Tipple Equipment

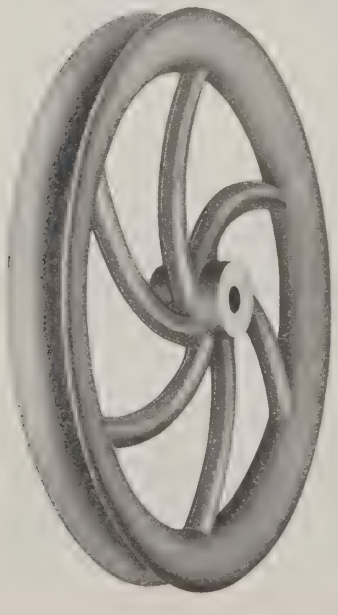


Design

Our Tipple Equipment Department is in charge of an expert body of enginees, who are able to design, build or re-model your tipple, either in part or in whole, to your entire satisfaction.

Construction

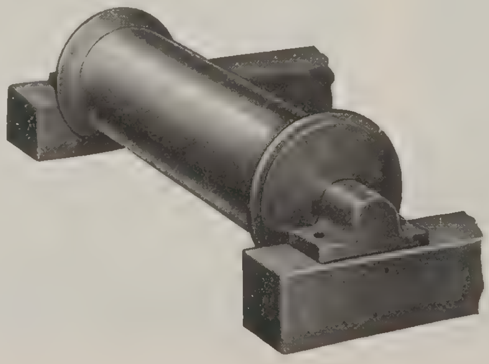
Our Construction Departments, located at Charleston, W. Va., are completely fitted up with the latest improved machinery, and are in position to manufacture the entire equipment, as well as chutes, curves, screens, loading booms, or any parts you may need in the least possible time.



Castings

Our large, well equipped foundry and pattern shops are prepared to supply your needs, either stock or special designs of

ROLLERS
SHEAVES
GEARS
PINIONS
BRAKE SHOES
COKE OVEN CASTINGS
GRATE BARS
PILLOW BLOCKS
BOXES
FROGS AND TURNOUTS
FLY WHEELS
ETC., ETC.



The Morrow Manufacturing Company

WELLSTON, OHIO

Manufacturers and Contracting Engineers

Products

We are designers and builders of

Complete Coal Tipple Equipment;

Steel Tipples;

Independent Steel Frame Shaking Screens;

Plain Shaking Screens, using the well-known and tried "Morrow Crank Drive;"

Plain and Safety Self Dumping Cages;

Loading Booms;

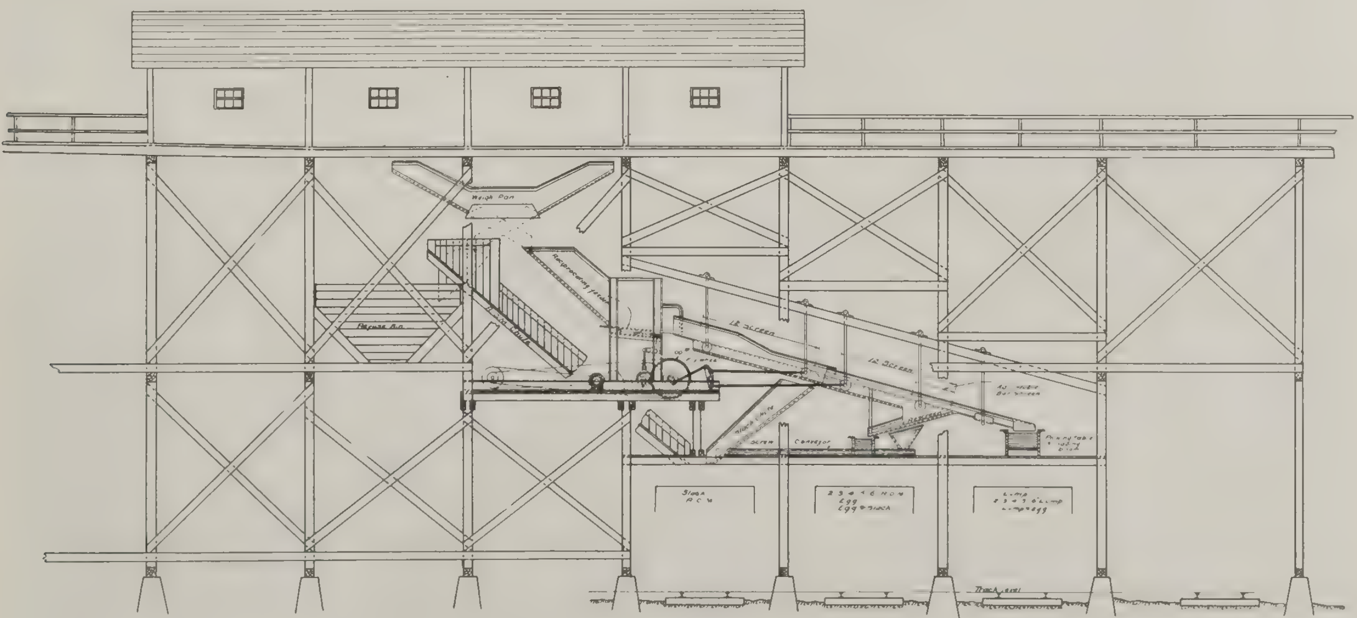
Conveyors;

Picking Tables, Etc.

It is quite as important that you purchase the kind of machinery that is best adapted to your needs as it is to buy first-class goods. You can improve the condition of your output and realize a better price for your product through the use of machinery especially designed and built to meet your requirements.

Experience

The President of this Company became identified with the coal business over fifty years ago. During all these years he has followed the industry and has naturally gained a wide experience in all branches of it. This experience which has cost years of labor as well as much money, together with the services of our now more active engineers is placed at the disposal of those desiring to equip their coal tipples in the most practical and satisfactory manner.



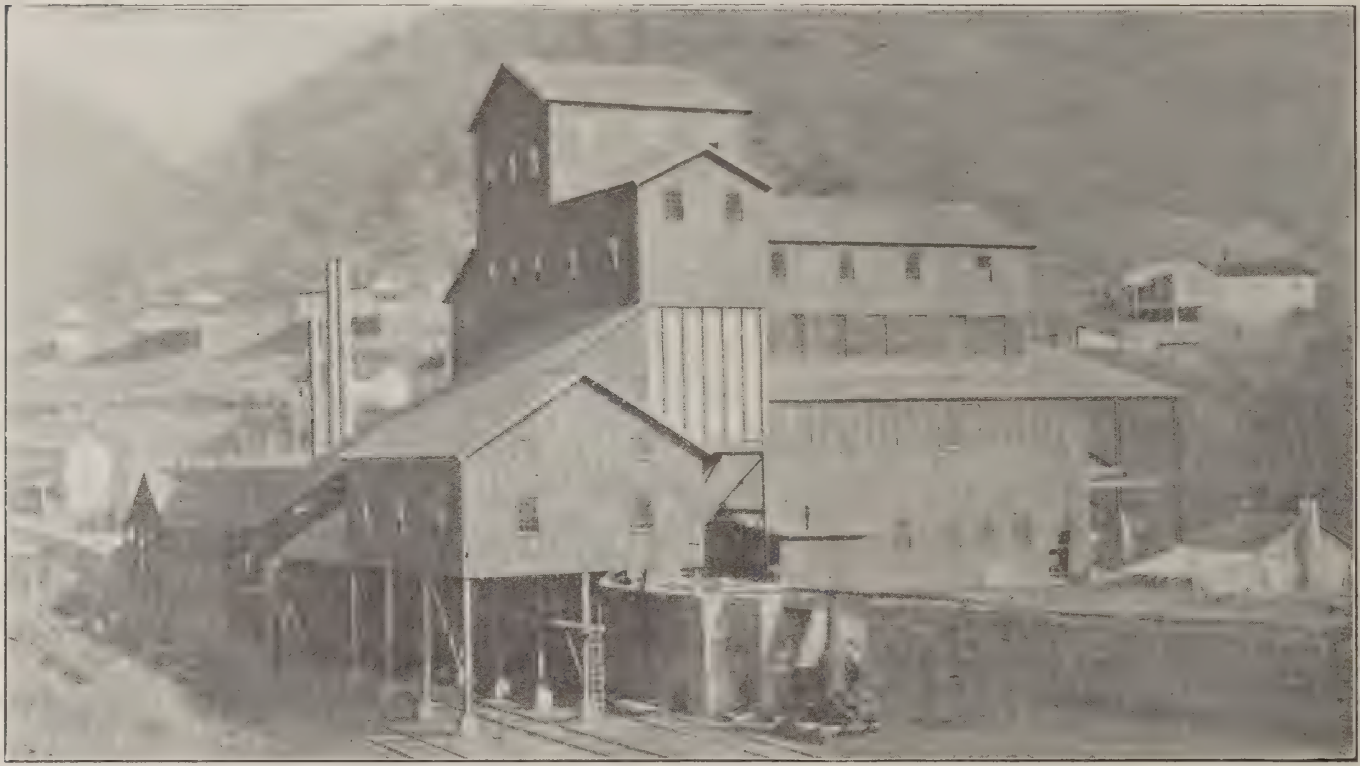
Plant Designed and Built for The Zanesville Coal Co., Zanesville, Ohio.

PITTSBURGH COAL WASHER CO.

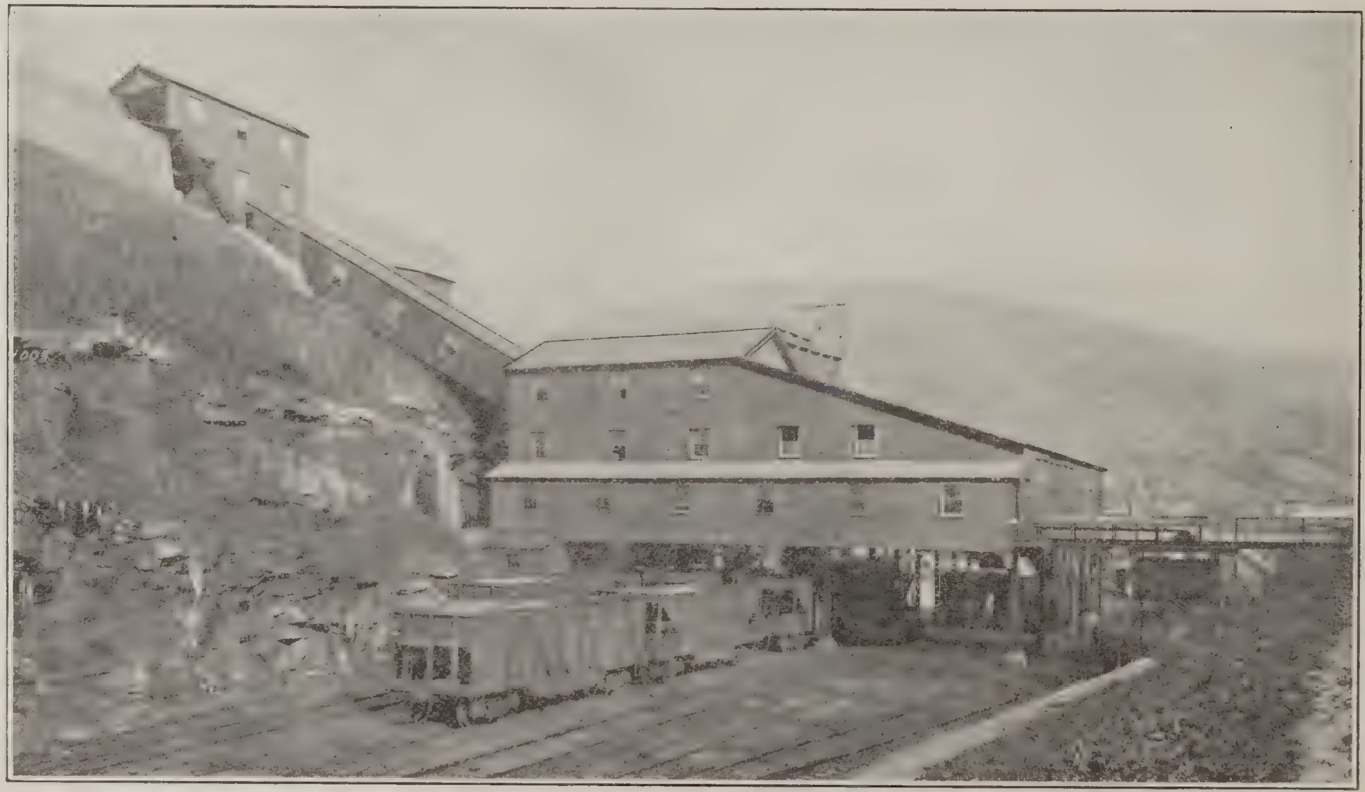
Office, Fulton Bldg. PITTSBURGH, PA. Works, Ambridge, Pa.

Engineers and Contractors

Manufacturers of Elevating, Conveying and Coal Washing Machinery



Modern Coal Washer and Tipple, Designed, Built and Equipped for the Indian Ridge Coal & Coke Co., Worth, W. Va.



Lick Branch Colliery, Designed, Built and Equipped for the Pocahontas Consolidated Collieries Co., Inc., Pocahontas, Va.

Products

We manufacture the following products: Coal Tipples, Coal & Coke Handling Plants, "Improved" Pig Iron Casting Machines, Coal Washing Plants, "Pittsburgh" Jig (Reciprocating Type), "Pittsburgh Special" Jig (Plunger Type), Coal Crushers, Car Hauls, Picking Tables, Retarding Conveyors, Loading Booms, Electric Hoists, Shaker Screens, Gravity Screens, Spiral Lowering Chutes, Coaling Stations, Coal Elevators, Steel Thimble Roller Chains, Special Steel Chains, Double Beaded Conveyor Pans, Elevator Buckets, Sprocket Wheels, etc., etc., etc.

Lip Screen between Picking Tables and Loading Conveyors.

Construction

We are prepared to construct all plants designed and manufactured by us with up-to-date equipment and thoroughly experienced mechanics.

Three-Compartment Double Beaded Conveyor and Picking Table.

Picking House showing Receiving End and Skylights.

Designing

We make complete plans and specifications for both Structure and Equipment, for—Coal Tipples, Coal Washers, Power Plants, Pig Iron Casting Machines, Coaling Stations, etc., and are often retained to make plans and specifications to be submitted to manufacturers for quotations.

Discharge End of Picking Table.

Experience

The Modern Plants Designed, Built and Equipped by us demonstrate our experience. The following are names of customers for whom we have recently done work:

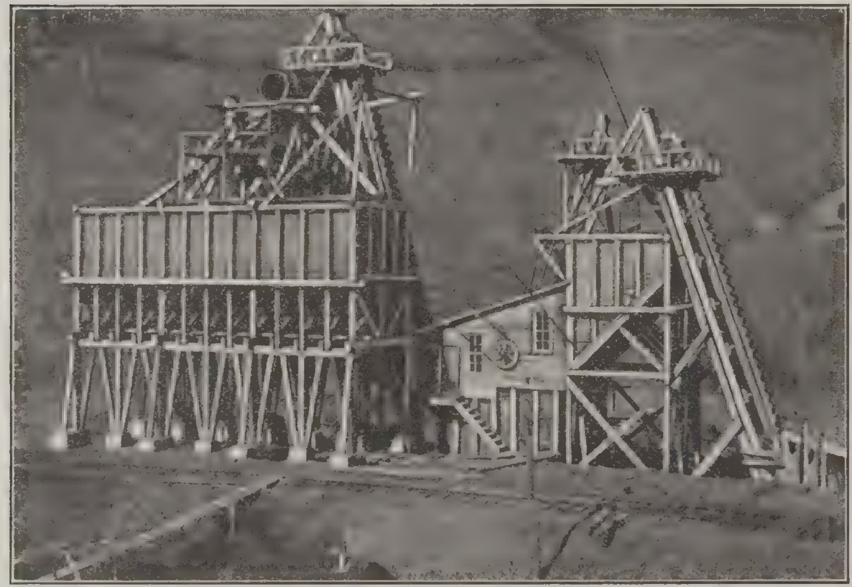
Indian Ridge Coal & Coke Co.	Worth, W. Va.
Pocahontas Consolidated Collieries Co., Inc.,	Pocahontas, Va.
Bottom Creek Coal & Coke Co.	Vivian, W. Va.
Houston Collieries Co.	Cincinnati, Ohio
Lilley Coal & Coke Co.	South Brownsville, Pa.
Minnesota Steel Co.	Duluth, Minn.
United Iron & Steel Co.	West Middlesex, Pa.
Penn Iron & Coal Co.	Canal Dover, Ohio
United Furnace Co.	Canton, Ohio
Buffalo Union Furnace Co.	Buffalo, N. Y.
Columbus Iron & Steel Co.	Columbus, Ohio
Wilson-Berger Coal Co.	Harlan, Ky.
H. T. Wilson Coal Co.	Logan, W. Va.
The Star Coal & Coke Co.	Red Star, W. Va.
Main Island Creek Coal Co.	Omar, W. Va.
Island Creek Coal Co.	Holden, W. Va.
Rich Creek Coal Co.	Logan, W. Va.
Scotia Coal & Coke Co.	Rush Run, W. Va.
The New River Co.	Macdonald, W. Va.
Yukon-Pocahontas Coal Co.	Yukon, W. Va.
Ashland Iron & Mining Co.	Ashland, Ky.
Logan Mining Co.	Logan, W. Va.

Montgomery Coal Washing & Mfg. Co.

BIRMINGHAM, ALABAMA
320 TWELFTH STREET.

Products

- Complete Coal Washing Plants.
- Screening Machinery.
- Elevating and Conveying Machinery.
- Steel Monitor Cars, Steel Mine Cars.
- Coke Oven Larries.



Montgomery Coal Washing Plant. Built for Black Mountain Coal Land Co., Pocket, Va. Capacity, 1,200 tons in eight hours. Bin capacity, 500 tons

Montgomery Plants are compact, rugged and accessible.

Continuous Operation.

We realize the importance to the operator of continuous operation.

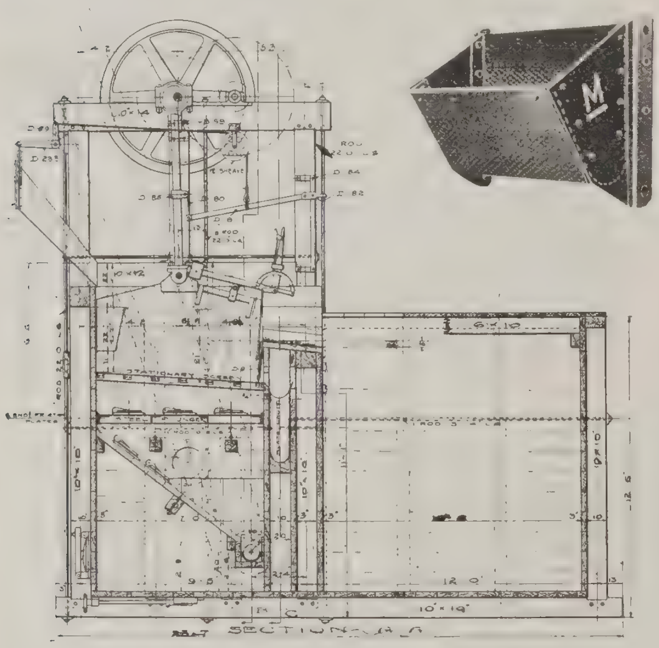
Delay versus Repair Parts.

We realize that it is delay and not the repair part which costs the operator money.

Design and Manufacture.

We realize that in order to meet the exacting requirements of the operator we must design and manufacture all of the machinery used in our plants.

We realize that our designs must be the product of years of experience and that the manufacture of our machinery must be accomplished in such a way as to leave no question of interchangeability, or of defect in workmanship or material.



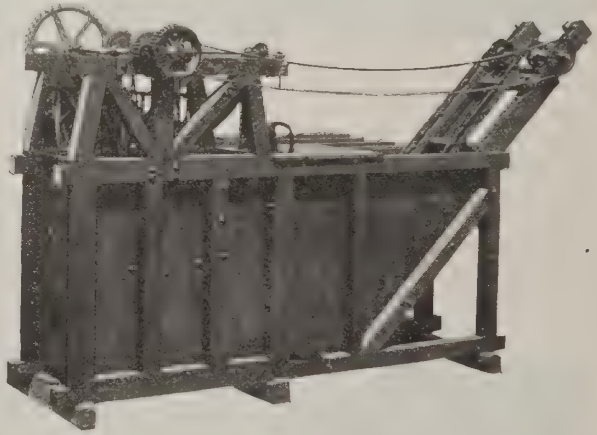
Cross Section of Montgomery Jig.

Some facts about the MONTGOMERY Jig. The MONTGOMERY gets a better separation and wastes less coal than any other jig. The MONTGOMERY occupies less space and uses less power than any other jig.

The Montgomery is simple in construction and easily accessible.

The MONTGOMERY requires no centrifugal pump; the water is circulated by the jig plunger itself.

The MONTGOMERY is so designed that the refuse is discharged into a separate compartment and never comes in contact with the circulating water.



Montgomery Self-Contained Coal Washing Machine. Capacity 200 tons in eight hours.

The MONTGOMERY Self-Contained machine can be used to advantage wherever a plant of limited capacity is required. The entire plant including settling tank and elevators, is fabricated and erected in our shops and shipped complete ready for installation.

Our principles of design and workmanship are applied to this machine as well as to our plants of larger capacity.

ROBERTS AND SCHAEFER CO.

CHICAGO, U. S. A.

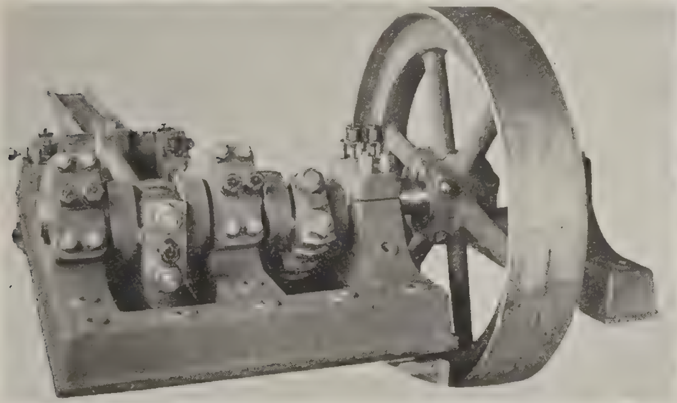
ENGINEERS AND CONTRACTORS

Designers and Builders of Complete Plants for the Economical Handling and Preparation of Coal

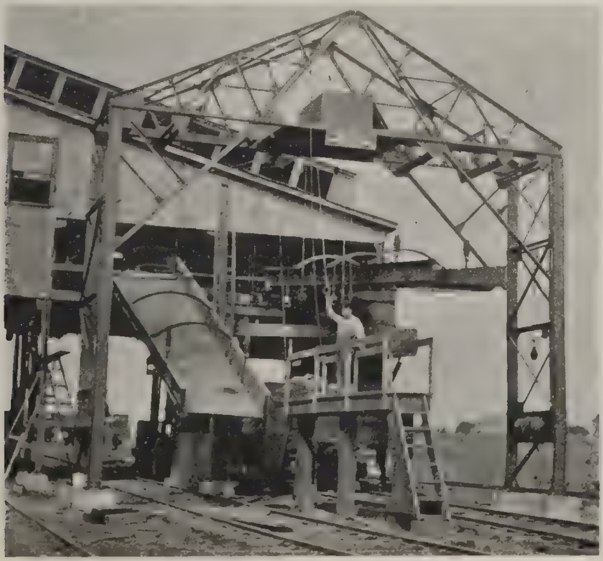
Products

Complete Coal Mining Plants, Coal Tipples, Coal Washing Plants, Miners' Bath Houses, Mine Fans, Coal Dock Bridges, Rescreening Plants, Marcus Horizontal, and Inclined Screens, Picking Tables, Retarding Conveyors, Shaker and Apron Type Loading Booms, Coal Dryers, all types of Coal Elevating and Conveying Equipment, Jigs, etc.

Complete Coal Mining Plant of United Coal Mining Co., Christopher, Ill. Capacity 4500 tons per day.

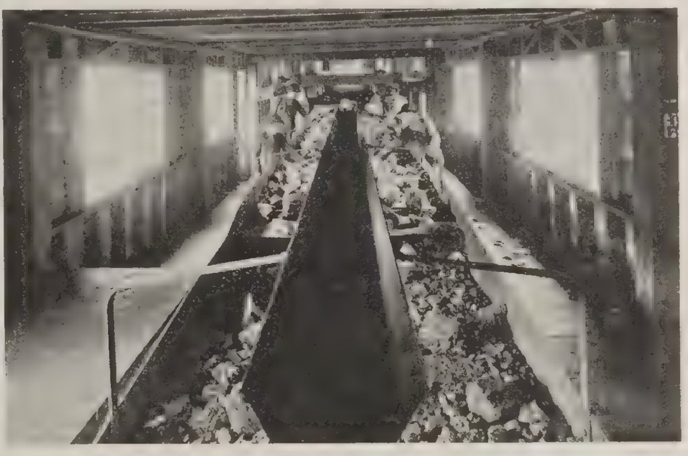


Driving Gear for Marcus Screens. Made in four sizes to suit capacity.



Our patented R and S Shaker Loading Boom at mine of Saline County Coal Co., Harrisburg, Ill.

Five Track Marcus Tipple of Cora Coal Co., Springfield, Ill. Capacity 3500 tons per day.



Marcus patented Picking Table Screen, with refuse trough attached, Milburn Coal Co., Milburn, W. Va. Capacity 2500 tons per day.

Combined Tipple and Washery, Cottonwood Coal Co., Lehigh, Mont., having capacity 3500 tons per day.

Our well-earned reputation of creating original and practical designs, gained through years of experience in the solution of problems presented in the coal fields of this country, Canada and Mexico, and the handling of our engineering and construction in such a manner as to thoroughly satisfy our clients, has placed us in a leading position in the coal handling and preparation industry.

We are not prejudiced in favor of any coal washing or tipple appliance, always basing our selection on the particular requirement.

Scottdale Machine & Manufacturing Co.

Main Office & Works
SCOTTDALE,
PENNA

Direct Representatives
S. H. MEEM & CO.,
Bluefield,
W. Va.

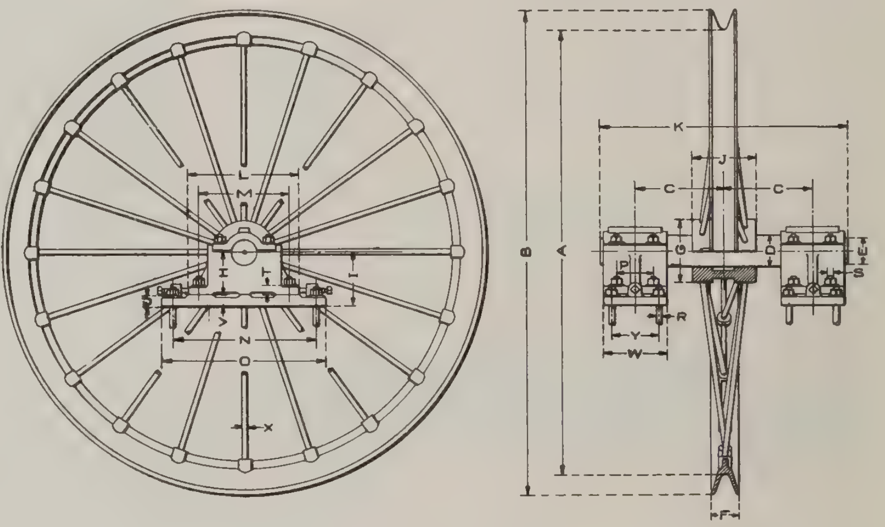
J. H. DONAHOO CO.,
Jefferson Co. Bank Bldg.,
Birmingham, Ala.

CROCKWELL MINE & MILL SUPPLY CO.,
Federal Reserve Bank Bldg.,
St. Louis, Mo.

Some Mine Specialties that We Manufacture

Then our Engineering Department assemble our products into complete plants, furnishing, preliminary layouts, estimates, and formal proposals, without cost to you, and if awarded the business furnish without additional cost foundation drawings, frame drawings, lumber bills and bolt lists—and will erect plant complete and guarantee the results required.

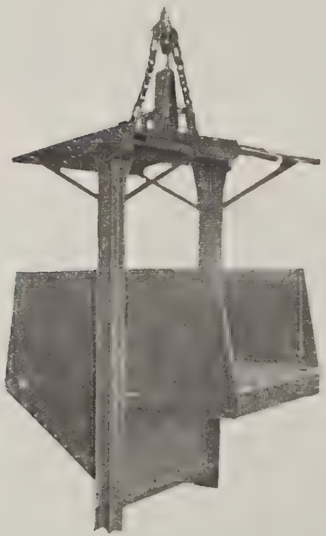
Our customers say our system is correct by their repeat orders.



	General Dimensions																									
Weight	Diameter		Dimensions In Inches																						No. Spokes In Sheave	Max. Dia. Rope Used
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	R	S	T	U	V	W	X	Y		
1932	6'-0"	6'-8"	15	6	5	5	12	8	10¼	12	43	20⅞	17⅛	27	31	7	1¼	1⅛	1¾	2	2¼	12	1	9	18	1
2133	7'-0"	7'-8"	15	6	5	5¼	12	8	10¼	12	43	20⅞	17⅛	27	31	7	1¼	1⅛	1¾	2	2¼	12	1	9	20	1⅛
3157	8'-0"	8'-8"	21	8	6	7⅛	17	9¼	11¾	15	60½	24¼	21	34½	38	12½	1¼	1¼	2⅛	2¼	2½	18	1⅛	14	24	1½
4182	10'-0"	10'-8"	21	8	6	7¾	17	9¼	11¾	18	60½	24¾	21	34½	38	12½	1¼	1¼	2⅛	2¼	2½	18	1⅛	14	28	1½
5382	12'-0"	12'-8"	21	8	6	7⅜	20	9¼	11¾	18	60½	24¾	21	34½	38	12½	1¼	1¼	2⅛	2¼	2½	18	1¼	14	36	1½
	14'-0"	14'-8"							1																	

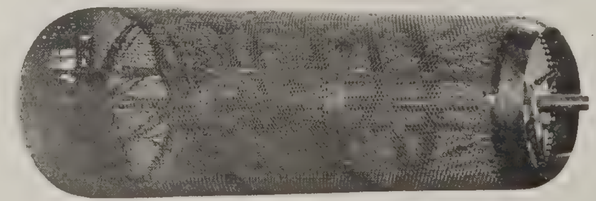
We make Sheaves, 14' diam., also. We make C. T. Sheaves from 2" to 60" diam. from 60 different patterns. Prices on application.

Our Monitors have 40 years' experience back of them, and they are right. Built in 4 to 20 ton capacities. Write us.



This is our Pennsylvania Self-Dumping Cage. We make all styles of dimensions to suit of 5000, 7500 and 10,000 lb. capacities.

We make Double Roll Crushers from 10 to 400 tons per hour capacity—½" to 3" product. We send full data on request.



Beside Gravity & Shaker Screens we build Revolving Screens for various materials—any capacity. We will quote if you send us your requirements.

Equipments and Tipple Designed and Erected by Us.

Cut shows Loading Boom Ladder. We make Loading Booms 22", 26" and 30" long—24" to 60" width. Compiled data for engineers on request.

THE WEBSTER M'F'G COMPANY

MANUFACTURERS OF

ELEVATING, CONVEYING AND POWER TRANSMISSION MACHINERY.

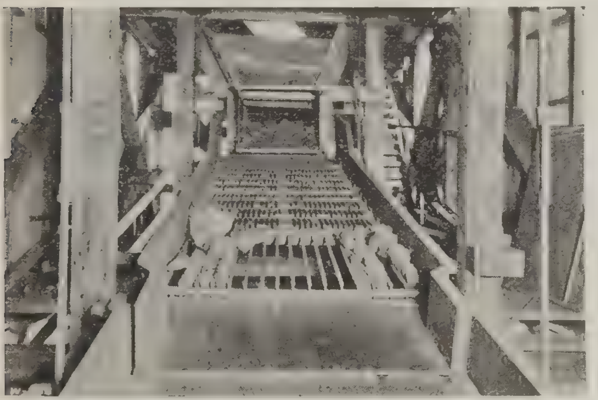
Main Office and Works: Tiffin, O.

Branch Offices: Chicago---McCormick Building. New York--90 West Street.

DIRECT REPRESENTATIVES

Philadelphia, Pa.	Chas. Bond Co., 520 Arch St.	**Chattanooga, Tenn**	R. R. Nixon, Hamilton Bank Bldg.
Buffalo, N. Y.	G. A. Hancock, 53 Carroll St.	**Birmingham, Ala**	G. R. Mueller, Brown-Marx Bldg.
Pittsburgh, Pa.	Dempcy-Degener Co., 307 Fourth Ave.	**Douglas, Ariz**	L. W. Mendenhall, 1019 Avenue G
Detroit, Mich	Palmer-Bee Co., Grand Boulevard	**Denver, Colo**	C. L. Dean, 1718 California St.
Columbus, Ohio	P. W. Holstein, 235 16th Ave.	**Salt Lake City, Utah**	Utah Engineering & Machinery Co.
Louisville, Ky	E. D. Morton & Co., 516 W. Main St.	**Los Angeles, Cal**	F. F. Foster & Co., 443 E. 3rd St.
Knoxville, Tenn	Webster & Co., Holston Bank Bldg.	**Seattle, Wash**	Brinkley Supply Co., 524 First Ave., So.
		Vancouver, B. C.	B. C. Equipment Co., Bank of Ottawa Bldg.

Flight Type Retarding Conveyor.


Feeder Delivering to Shaking Screens.

Products

Feeders, Crushers, Picking Tables, Loading Booms, Shaking and Rotary Screens.

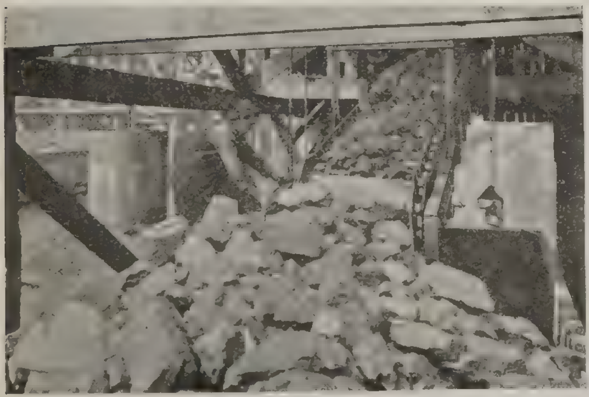
Conveyors of Belt, Apron, Flight, Scraper, Screw and other types. Bucket Elevators with Centrifugal or Gravity Discharge Buckets for Vertical or Inclined Lifts.

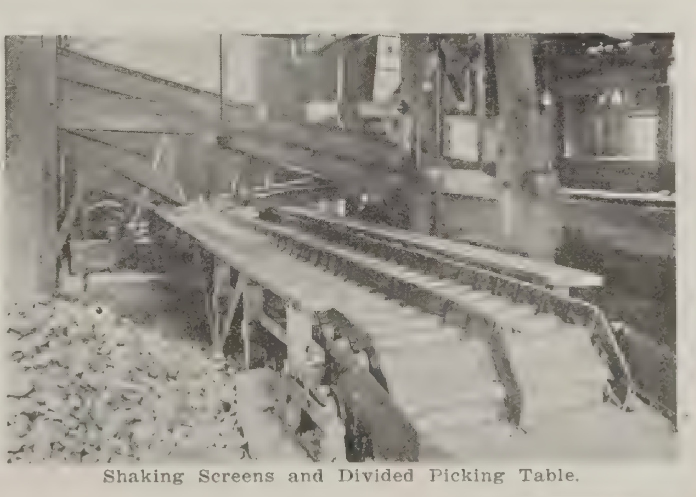
Pulleys, Gearing, Clutches, Rope Sheaves, Bearings, Eccentrics—a full line of Power

For Mine Operators

The above is but a brief outline of the Webster Products for Coal Tipples. We could not manufacture these successfully unless a thorough understanding of tipple problems and practices enabled us to design each unit to perform its duty efficiently, economically and in perfect harmony with the tipple as a whole.

We design and equip complete tipples, giving to each problem the careful study of engineers whose wide experience insures a design which embodies the best and latest in present day practice as properly adapted to the given conditions.


Loading Lump With Webster Loading Boom.


Shaking Screens and Divided Picking Table.

Wisconsin Bridge & Iron Company

GENERAL OFFICES AND WORKS
MILWAUKEE, WISCONSIN

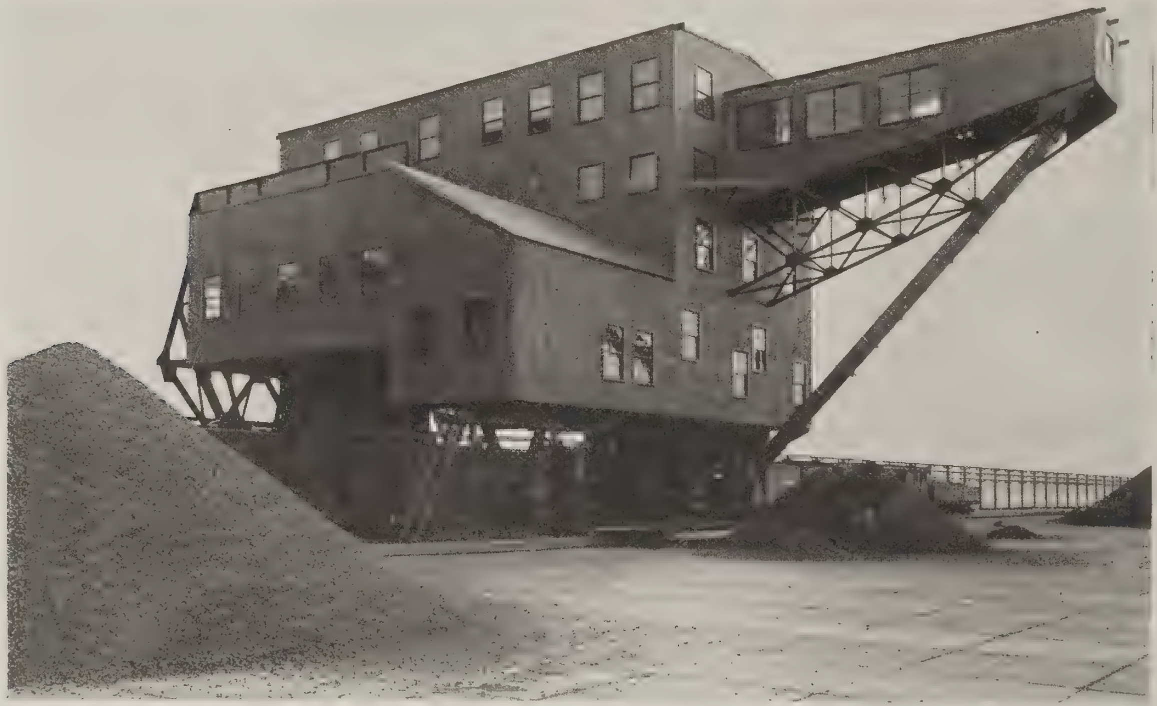
BRANCH OFFICES:

CHICAGO
1619 MONADNOCK BLDG.

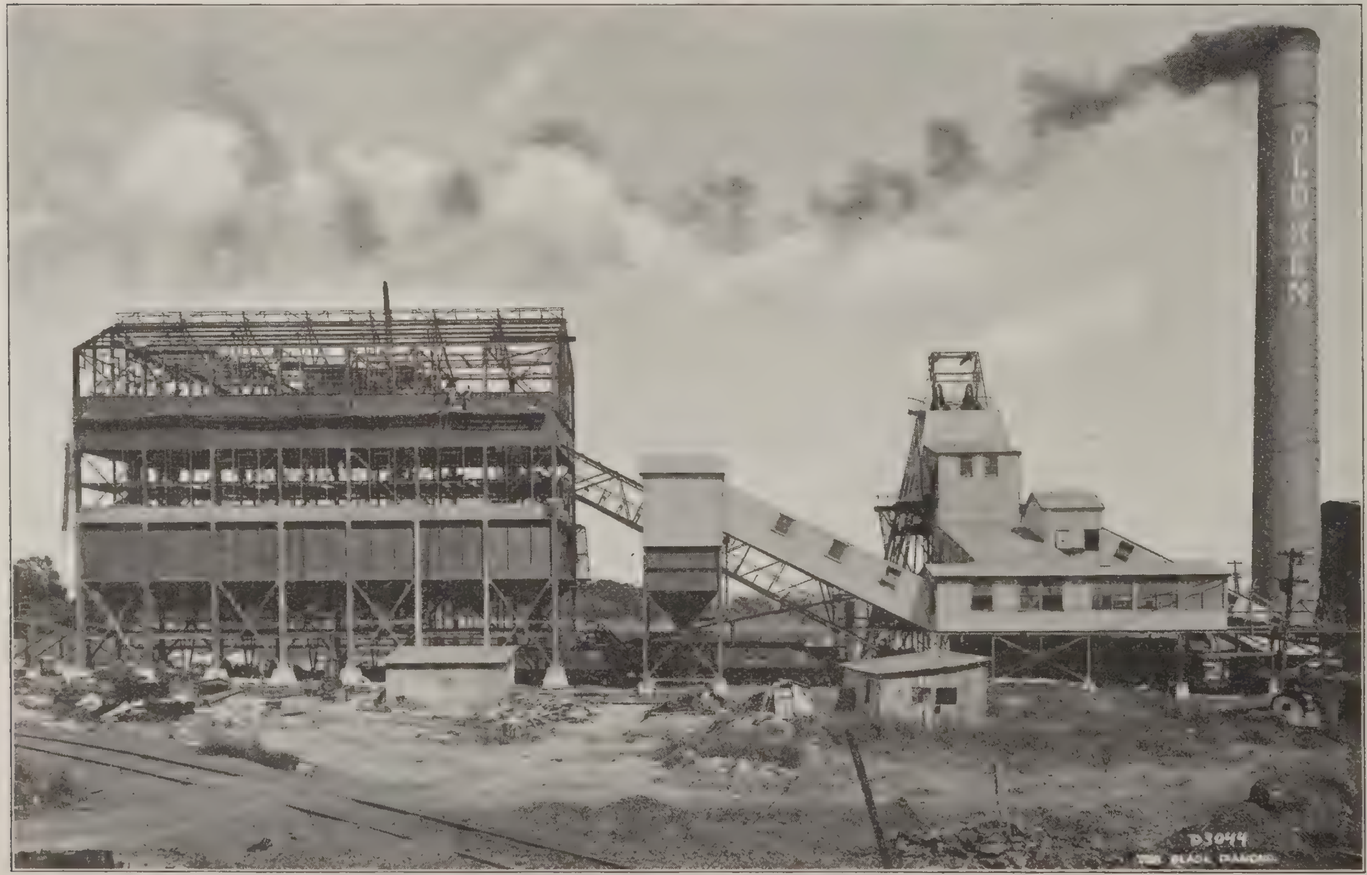
DETROIT
1362 PENOBSCOT BLDG.

KANSAS CITY
510 FINANCE BLDG.

Practical Engineers for Practical Operators



Traveling Rescreening Plant, Berwind Fuel Co., at West Duluth, Minn.



Top Works Old Ben Mining Corporation, No. 9 Plant at West Frankfort, Ill.

ANTHRACITE SEPARATOR CO.

HAZLETON, PA.

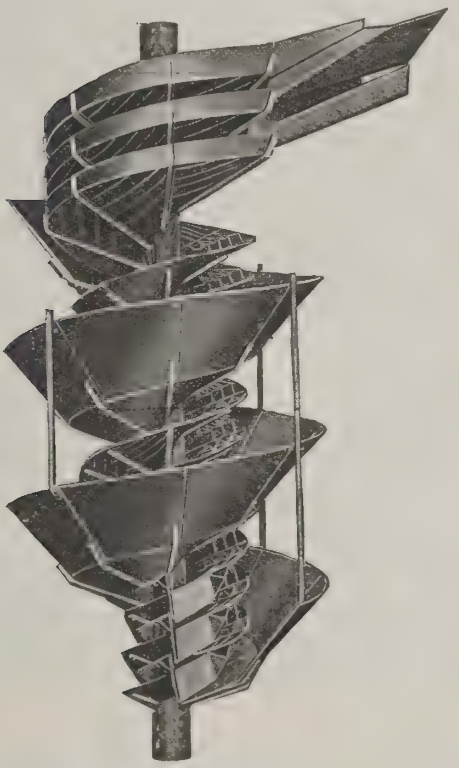
Manufacturers of Spiral Separators for Removing Slate and Other Refuse From Anthracite and Bituminous Coal

---

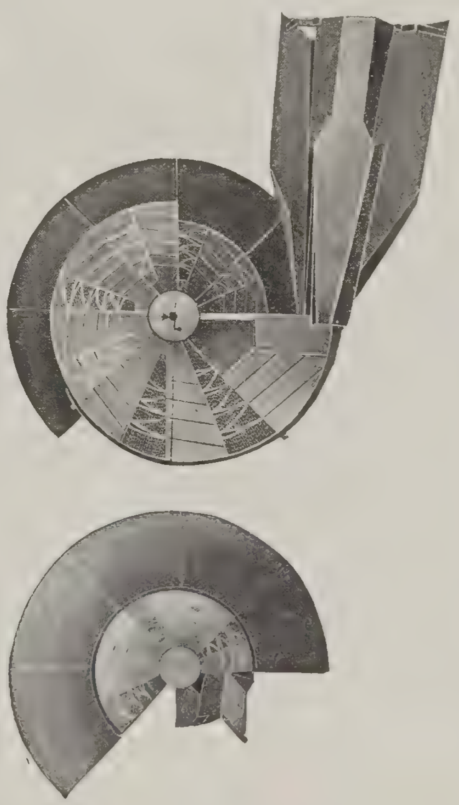
Products

Spiral Separators for cleaning coal, pick or separate, fire clay and other refuse from coal. No power is required, as spiral is stationary, and separation automatic; gravity, friction and centrifugal forces do the work, causing no vibration to the plant. Machines are substantially built for years of operation; they reduce the breakage of coal to a minimum, and occupy a small amount of space.

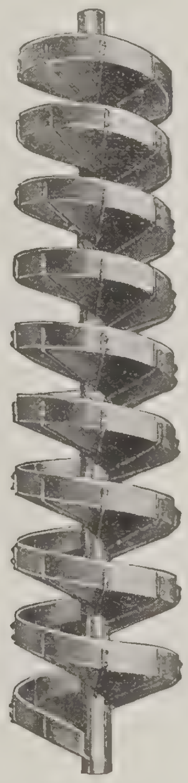
The material, after being properly sized by screens, is delivered to the feed chutes at the top of the spiral, where it is divided automatically and fed on the separating or slate threads, down which it is carried by gravity, while centrifugal force slides the coal off and into the separate flanged coal thread, at the same time, frictional resistance (aided by the formation of plates) overcomes the centrifugal force and downward speed of the slate or refuse material, holding it on the separating threads until it is delivered into a separate chute at the base of the spiral.



Right, 27 in. Pitch, Chestnut Separator, 1912 Type.



Right, 27 in. Pitch, Chestnut Separator, Top and Bottom Plans.



Spiral Chute. For Lowering Coal Without Breakage.

We have many spirals in use in which each machine is separating several different veins of coal, even though some of the veins have slate of which the specific gravity is higher than the coal in other veins.

Capacity

The 1912 type spiral separator has greatly improved the separation over the old form of spiral, and will separate at the rate of 6 to 8 tons per hour with greater efficiency than the old type at 4 to 6 tons per hour.

One important feature of the spiral is the ease of adjustment while in operation. Very little time is required for attention to spirals after they have been adjusted to suit conditions, but it is well to have a man learn the care of spirals so as to make intelligent adjustments and keep them in good order.

Spirals are operated unde the dry method, also where the coal is washed on the sizing screens.

We also manufacture spiral chutes, or telegraphs, for lowering coal without breakage. The chutes are made so that coal will not block, but will start running or free itself upon release of outlet at bottom of spiral, even though filled with coal from bottom to top of spiral chute before being released. Send for our latest catalogue of spiral separators and spiral chutes. We have wide experience on these subjects.

The economy of spiral separation is well worth consideration as well as the making of a cleaner coal to hold the market for your trade by its use.

DODGE SALES & ENGINEERING CO.

MISHAWAKA, INDIANA

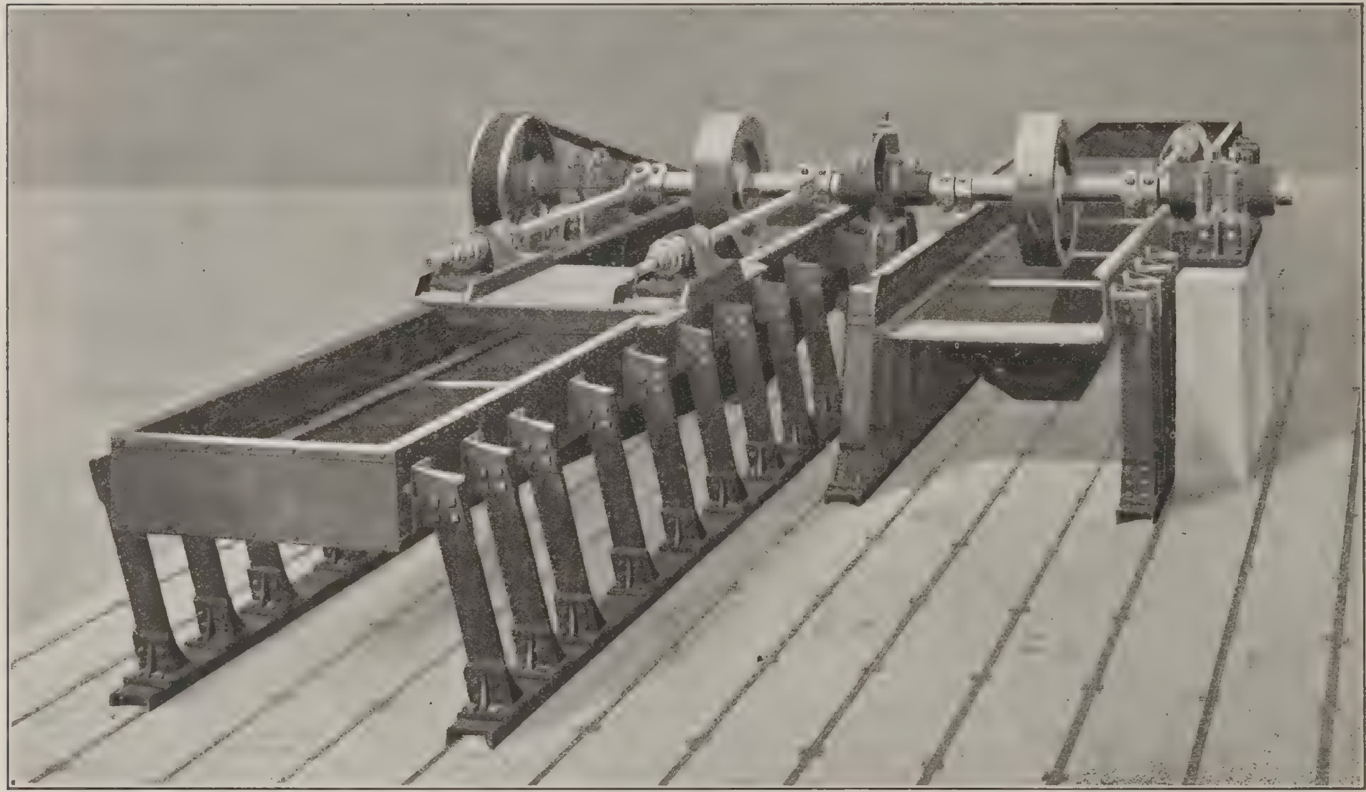
Distributor of the Product of

Dodge Manufacturing Company

Zimmer Conveyors, Screens and Picking Tables

The economical transportation of material is the greatest problem in the manufacturing and mining field, and, notwithstanding the perplexity of the individual case, there is one underlying thought always dominant—the upkeep cost.

First cost has its proper consideration as does the power cost, but the bugaboos of rapid wear and tear, early and frequent replacement, shutdowns, etc., most deeply concern the operator. In the Dodge-Zimmer conveyor we have evolved a system that comes nearer keeping down the cost and overcoming the effects of conveying machinery generally that anything yet placed on the market. The keynote of our new conveyor is simplicity—the short, direct way to efficiency and economy.



Dodge-Zimmer Ore Screens for Rosiclaire Lead & Fluor Spar Company. Set up on the testing floor in the Dodge Shops, Mishawaka, Ind.

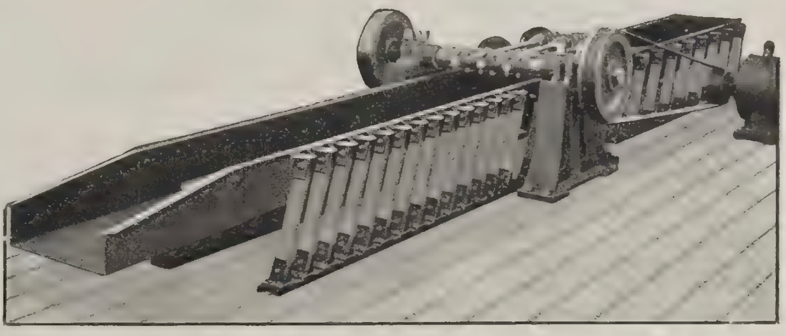
Mechanics tell us that a chain is no stronger than its weakest link. By the same token a conveyor is no more reliable than its weakest part. Chain and link conveyors of various types have been used for many years, particularly in handling coarse substances or when operating in dirty places, where they have proven most expensive in maintenance.

The breakage of any one of a thousand or so parts means disablement not only to the conveyor, but to every dependent part of the works or operations in which it is incorporated.

It also requires double the amount of working chain and parts because of returning strands. This increases the power required, adds to the friction and wears out double the amount of parts really needed to perform the work.

In the Dodge-Zimmer, wherever its use may be recommended by us these annoyances and expenses are minimized. The material travels forward in one continuous stream, without dragging or abrasion and without transporting any of the mechanical parts.

One driving mechanism is employed, the bearings of which, located at one point, alone requiring attention. There is no deterioration of material due to abrasion.



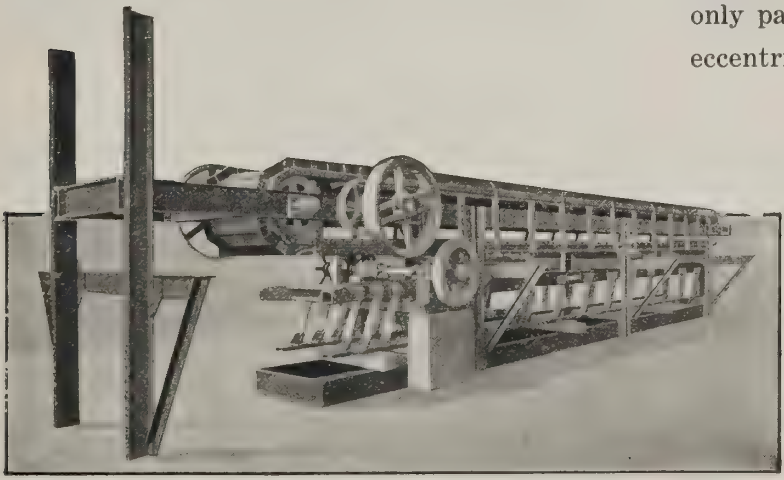
Balanced Type of Dodge-Zimmer Conveyor

Discharge of all of the material may be made at any point or a portion of several points as desired; likewise may the conveyor be fed at one or more points, making a common or divided delivery.

When receiving, conveying or depositing dusty materials, the trough may be inclosed and this prevents loss or nuisance from escaping materials, as is characteristic with other methods.

In certain service where the grading of materials is required, such as coal, stone, etc., the Dodge-Zimmer performs one of its most noteworthy functions by screening or separating and discharging the different grades during the process of transportation. As a cooling or drying apparatus it is a perfect success, and a more effective coal-picking table was never devised.

The Dodge-Zimmer consists of a steel trough of proper depth and width for the capacity required and the material to be conveyed. This trough is supported by or suspended from laminated spring legs. It is attached to the driving mechanism by connecting rods.



In operating the conveyor has a short backward and forward motion, with a slight rise on the forward stroke, which moves the material in the trough in a smoothly floating stream. The material may be screened in transit, and delivery made from the end of the conveyor, or by the use of openings and slides or gates in the bottom.

The advantages of the Dodge-Zimmer summed up are:

(1) SIMPLICITY IN CONSTRUCTION, IN INSTALLATION AND IN OPERATION. The conveyor is assembled and tested at the Dodge shops and shipped in sections so that the installation is simple and inexpensive. In operation the only part that moves on a wearing surface is the eccentric shaft in the driving mechanism.

(2) THE SMALL AMOUNT OF POWER REQUIRED TO OPERATE. A conveyor 12 inches wide and 65 feet long, carrying seven tons of coal per hour, requires 1 brake horse power.

(3) DURABILITY. The few moving parts in this conveyor reduce the wear and tear to a minimum and render cost of maintenance low.

G. H. ELMORE

ELMORE PHILADELPHIA SCRANTON ELMORE

Engineer

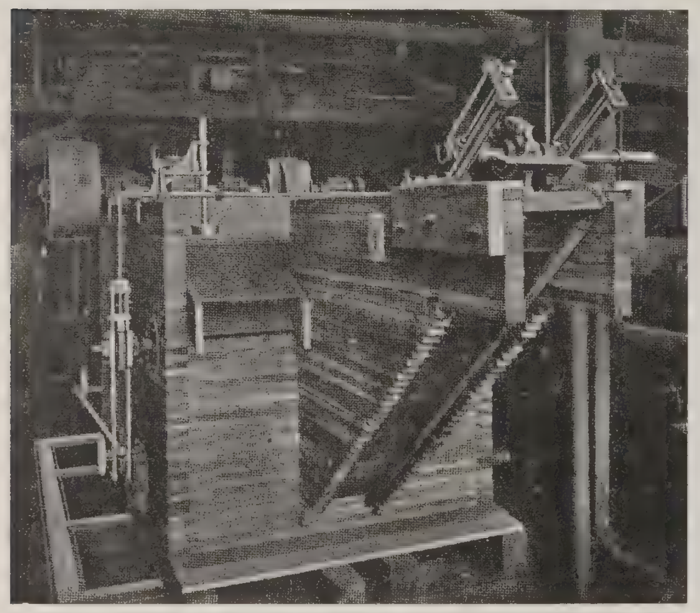
Preparation of Coal

Products

Jigging Machines, Automatic Jig Control, Continuous Centrifugal Dryers, Acid Resisting Centrifugal Pumps, Ore and Coal Preparation Equipment, Ore Dressing, Coal Washing.

The machines here illustrated for jigging coal are the largest made in the United States, if not in the world. This accounts for their very large capacity. They are made in three principal types, namely: No. 600, No. 600-A, and the No. 500.

The No. 600 and the No. 600-A machines are similar in all excepting the construction of the slate valve which removes the refuse from the jigging sieve automatically as fast as it accumulates and at the same time maintains it at a constant thickness on the bed of the jig.



No. 600-A, Bituminous or Anthracite Coal Jigging Machine.

The No. 600 machine has the closed type of refuse valve: that is, material discharged from it passes directly out of the machine into the open without any elevator, drag conveyor or other such devices. The valve is so close that very little water goes with the refuse.

The No. 600-A machine has the open type of valve which, when it is rotated to discharge the refuse, drops it on a slowly moving drag conveyor, as shown, which removes it from the tank.

The No. 600 type is good for all sizes of fine coal up to about ¾″. All other sizes up to 5″ are very successfully handled on the No. 600-A machine. The No. 600 type jig is not illustrated.

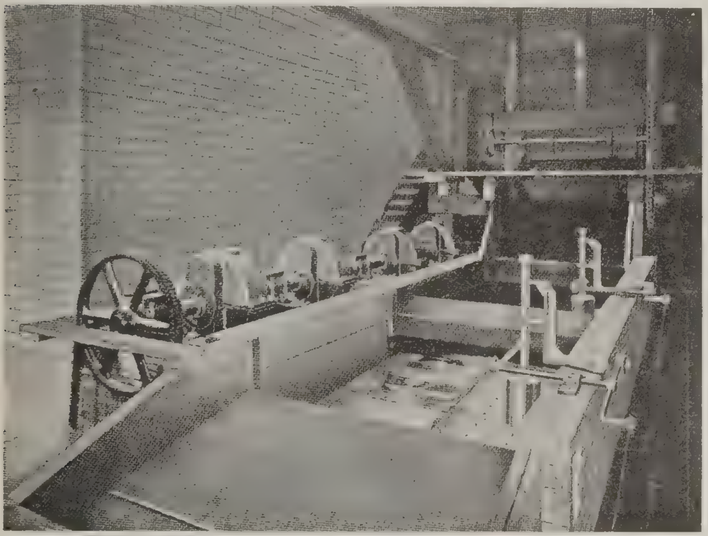
The No. 500 type machine is used for preparing coal for coking, in which case it is always desirable to remove the ash and sulphur to the lowest possible point. This No. 500 machine makes a three-part separation. The first compartment takes off the pure refuse, the second compartment takes off an intermediate product or bone, and the good, clean coal goes over the last overflow plate with the water used in the jigging process. In other words, all the coal is jigged over two sieves, each five feet long, and this machine has produced the lowest ash and sulphur that has been obtained in any jigging machines in this country in actual and regular operation.

The illustrations reveal the general construction of these jigs. First, the tanks are made of 2 x 6 lumber, surfaced on all four sides and spiked together flatwise, with two strands of candle wicking between each layer of wood, the corners and intersections alternately overlapping. This makes, by far, the strongest jig tank that has ever been constructed from wood, and when made of good material like cypress, it is practically non-destructible because of rot. All the eccentrics are enclosed in self-oiling housings. This makes them dustproof and by far the most durable eccentric constructions that have ever been placed on a jig. The machinery throughout is the heaviest that is used on any jigging machine made. The iron work alone on the No. 600-A machine, as shown in the illustration, weighs over fourteen thousand pounds.

When a sized product is being treated, a perforated metal screen is placed over the overflow plate, over which the water and coal moves as it leaves the jigging sieve, and the separation between the coal and the water is made at that point as shown. The coal can go direct to the pockets and the water is always recirculated to the jigs again.

For this purpose, the Elmore Acid Resisting Centrifugal Pump, shown on page 429 of this catalog, is most highly recommended. Besides their great capacity and very strong construction, the main feature of these jigging machines is found in the automatic control of the refuse draw. For the first time I am able to announce a truly automatic jigging machine.

Reference to the illustrations will note a float device in one corner of each compartment. This float is a hollow cylinder of steel, the bottom of which rests on the top of the slate bed. The float is set to maintain this bed at any desired thickness. This float has a slight upward and downward movement with the action of the material in the jigging sieve, due to the jigging stroke, and by means of a wire at the end of the lever on the outside of the tank, connection is made with the pawl which operates the ratchet which rotates the refuse valve. A counterweight on the lever maintains the float at the proper level and keeps it all the time on the top of the refuse, it being a very simple matter to adjust this counterweight to get the desired effect.



No. 500 Type Jigging Machine for Preparing Coal for Coking Purposes.

As refuse comes on the jig with the feed and begins to accumulate on the jig sieve the float begins to raise, which immediately drops the pawl into the ratchet teeth and rotates the refuse valve, which then drops out a certain amount of refuse. This draw will continue until the float has been lowered to a point where the pawl is raised out of the ratchet teeth. The rocker arm which carries the pawl is all the time in motion backwards and forwards, so that any time the pawl is dropped into the teeth, the refuse will be drawn, and whenever it is raised out of the teeth, the refuse will not be drawn.

The apparatus is so simple that it seems incredible that such perfect results can be obtained. This whole apparatus is thoroughly covered by patents, (as are many other features of these machines), the whole principle being involved in the fact that it is very easily possible to make a large float such as is shown, remain on top of the refuse by simply adjusting its average specific gravity to a point where it is heavier than the coal and lighter than the refuse, and this is all done by the counterbalance as shown, and that very quickly.

The fact is that with this apparatus on a jigging machine, the human element is practically removed from the art of coal jigging, absolutely uniform results are all the time obtained, the same grade of coal and the same grade of refuse. The only attention the jig requires is occasionally oiling and the regular slushing of the hutch.

The No. 500 type machines, which handle fine coal, have the closed type of valve, it being desirable to grind the coal usually all below 3/4″ before it is passed to the jig in order that the sulphur and ash may be freed from the coal itself. There is no difficulty whatever in handling this fine product.

This type of jig is in operation in several large coal washing plants in the country, handling coal sometimes at the rate of seventy-five tons per hour for each machine and where forty per cent of the feed will pass through a 1/4″ hole.

Drying Washed Coal by Centrifugal Force

Eight ELMORE Continuous Centrifugal Dryers have been in successful operation in four coal washing plants built during the past three years. These machines entirely replace drainage bins or pits and immediately prepare the washed coal for charging into either by-product or beehive ovens. They are equally useful for removing the water from washed slack before loading into cars.

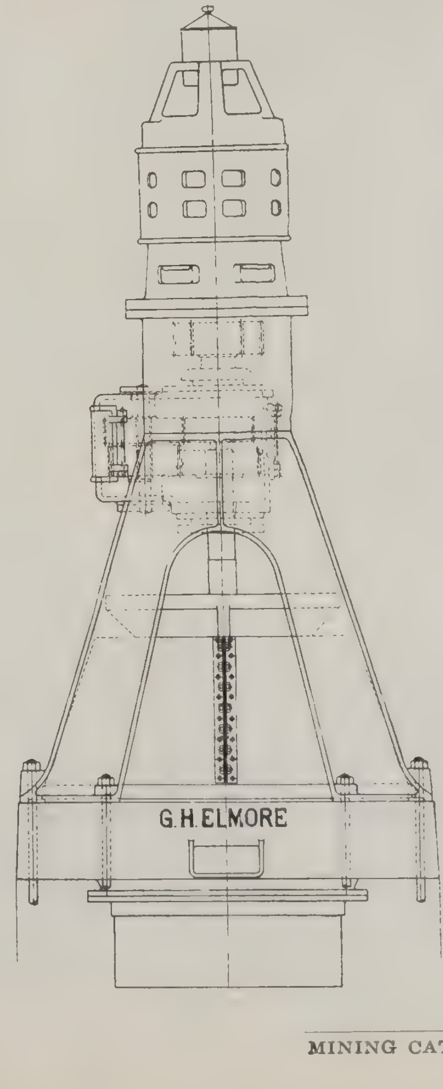
They instantly reduce the water to from six percent to eight percent total moisture, including the internal moisture, which varies from one and and a half percent to three percent.

The machine has been recently re-designed with a heavy cast iron frame, as shown in the line drawing, instead of the structural frame heretofore furnished.

Thjey have a capacity of from sixty to eighty tons per hour of dried coal, and the consumption of power, capacity considered, is low. Made either for motor or belt drive.

Write for full information.

Write For the New, Fully Illustrated Bulletin on on the whole subject of COAL JIGGING



STEPHENS-ADAMSON MFG. CO.

AURORA, ILLINOIS

BRANCHES

50 Church Street, New York, N. Y.
First National Bank Bldg., Chicago, Ill.
H. W. Oliver Building, Pittsburgh, Pa.
824 Dime Bank Bldg., Detroit, Mich.
803 Federal Reserve Bank Building., St. Louis, Mo.
First National Bank Bldg, Huntington, W. Va.
79 Milk Street, Boston, Mass.
Dooly Block, Salt Lake City, Utah.
310 Stair Bldg. (E. J. Banfield, Agent) Toronto, Ont.

Modern Tipple and Washery Equipment, Coal and Ash Handling Machinery for Power Plants

A pair of "S-A" Twin Revolving Screens, Style 24-T, 5-ft. dia. by 18-ft. long.

A pair of "S-A" Bucket Elevators in the washery of the Sycamore Coal Co. The buckets are carried on long pitch steel bar link chain. We also manufacture elevators with buckets carried on malleable chain or on rubber belt, depending upon the conditions.

Products

We design and manufacture complete machinery equipment for the handling and preparation of coal, including:

Conveying and Elevating Machinery
- Belt Conveyors.
- Steel Pan Conveyors.
- Screw Conveyors.
- Drag Conveyors.
- Pivoted Bucket Carriers.
- Gravity Discharge Conveyor Elevators.
- Bucket Elevators.
- Automatic Feeders.
- Gates, Valves and Spouts.

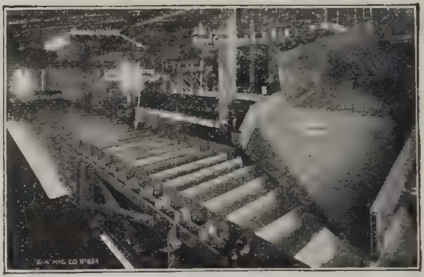
Screening Machinery
- Revolving Screens.
- Shaking Screens.
- Grizzlies.

Transmission Machinery
- Shafting.
- Bearings.
- Pulleys.
- Gears.
- Friction Clutches.
- Rope Transmission Systems.

Our Engineering Service

We maintain a large corps of engineers experienced in this class of work. We are thus equipped to render valuable assistance in the design of tipples and washeries and in the design of special machinery for the same. We also design and manufacture conveying and screening equipment to meet the specifications of engineering firms specializing in the design of washeries and tipple, and our facilities for producing this special work are unexcelled.

We invite correspondence or consultation with any of our branch engineering offices.



A pair of "S-A" Shaker Screens delivering to egg and lump loading boom conveyor, in plant of Thomas Coal Co.

Spiral Chute lowers from shaking screen to bin without breakage.

General View of Tipple and Washery, Sycamore Coal Co. Retarding Drag Conveyor at left. Steel Pan Conveyor Loading Booms at right over tracks. Washed coal loading tracks beneath bins. This plant is completely equipped with "S-A" machinery.

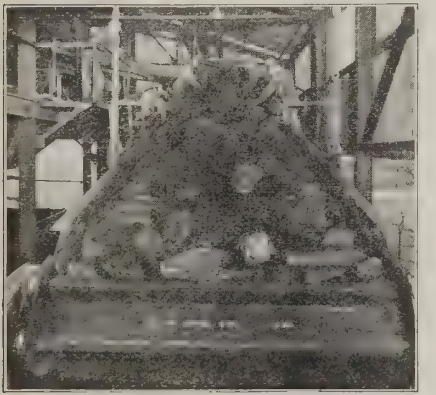
Plant of the American Coal Mining Co., equipped with "S-A" Belt and Steel Pan Conveyors. These Conveyors serve also as picking tables and lowering booms for the lump coal.

STEPHENS-ADAMSON MFG. CO. Continued

"S-A" Belt Conveyor equipped with Unit Carriers delivering coal to washery in plant of Chicago Wilmington Vermillion Coal Co.

"S-A" Steel Pan Conveyors. These have the advantage of slow speed, large capacity and ability to handle large lumps without breakage. Our single-beaded pans allow discharge to be made with very slight drop.

Shop Photo of "S-A" Steel Pan Conveyor Lowering Boom which places the coal gently in the car.

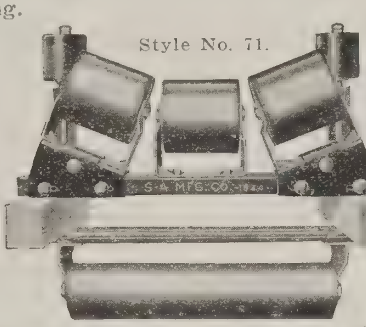


Installation view of Lump Loading Boom in action. This conveyor is pivoted at the center. The upper horizontal section serves as a picking table.

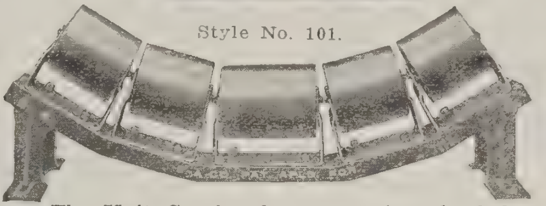
"S-A" Pivoted Steel Pan Conveyor—serving as Lump Loading Boom and Picking Table.

Unit Carrier

Trade Mark Reg. U. S. Pat. Office. Patents Pending.

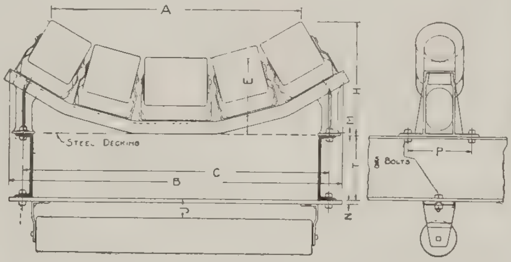


Style No. 71.



Style No. 101.

The Unit Carrier for supporting the belts of "S-A" Belt Conveyors is equipped with dust proff ball-bearings. The carrier is entirely of steel construction with rolls of seamless tubing. The advantages of this construction are obvious to engineers. Great strength and durability are secured in the carrier, but the greatest advantages lie in reduced friction, requiring less power and occasioning less wear on the belt. No attention is required by the carriers over periods varying from six months to two years.



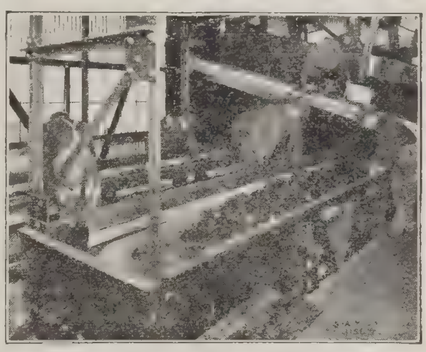
STYLE 71.
DIMENSIONS IN INCHES.

Width of Belt	A	B	C	E	H	J	M	N	P	T
*12	15½	25	21	9⅝	12½	2⅜	1⅝	...	...	5
*14	15½	27	23	9⅝	12½	2⅜	1⅝	...	...	5
16	18	29	25	9⅝	11½	2⅜	1⅝	...	...	5
18	20	31	27	9⅝	11½	2⅜	1⅝	...	...	5
20	22	33	29	9⅝	12½	2⅜	1⅝	...	...	5
22	24	35	31	9⅝	12½	2⅜	1⅝	...	...	5
24	26	37	33	9⅝	11½	2⅜	1⅝	...	...	6
26	29	39	35	9⅝	12½	2⅜	1⅝	...	...	6
28	29	41	37	9⅝	12½	2⅜	1⅝	...	...	6
30	33	43	39	9⅝	12½	2⅜	1⅝	...	...	6
36	39	49	45	9⅝	12½	2⅜	1⅝	...	...	8
40	42	53	49	9⅝	12½	2⅜	1⅝	...	...	8
STYLE 101.										
24	28	36½	33	9⅝	14⅝	2⅜	⅜	½	8	8
26	28	36½	35	9⅝	14⅝	2⅜	⅜	½	8	8
28	31½	40½	37	9⅝	14⅝	2⅜	⅜	½	8	8
30	32	42½	39	9⅝	14⅜	2⅜	⅜	½	8	8
32	32¾	44½	41	9⅝	15	2⅜	⅜	½	8	8
34	35⅝	46½	43	9⅝	15	2⅜	⅜	½	8	8
36	39	48½	45	9⅝	15⅛	2⅜	⅜	½	8	8
38	39	48½	45	9⅝	15⅛	2⅜	⅜	½	8	8
40	43¼	54½	51	9⅝	17⅛	2⅜	⅜	½	8	8
42	43¼	54½	51	9⅝	17⅛	2⅜	⅜	½	8	8

Note—Carrier pulleys are 6 inches in diameter 6 inches and 8 inches long according to belt. Return rollers are 4½ inches in diameter, and length equals width of belt plus 3 inches. Wood stringers may be substituted for steel channels. All carriers mounted upon 4-inch, 5¼-pound cross channels.

*12 and 14-inch carriers use two rolls only.

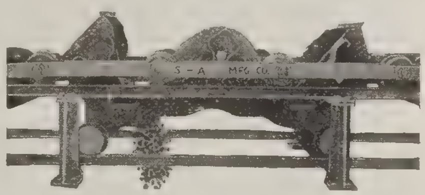
Style 101 can be used with three, four or five standard Units, although its advantages appear particularly when using wide belts. No wedges are used for the troughing rolls, but the Unit brackets are bolted directly to the channel, which is bent to allow the rolls to present a curved cradle to the belt. This secures greater capacity for the belt and bends the belt slightly at several points rather than bending sharply at only two points.



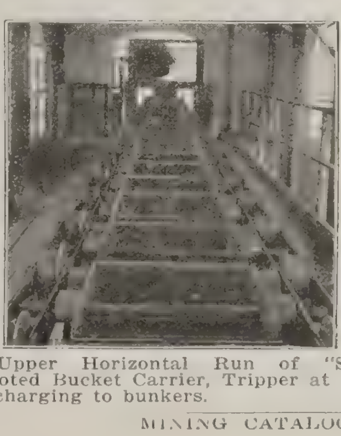
"S-A" Picking Belt Conveyors receiving from Shaker Screens in plant of American Coal Mining Co.

"S-A" Retarding Drag Conveyor lowering coal from mouth of mine to tipple of Spruce River Coal Co.

"S-A" Pivoted Bucket Carriers are used extensively in boiler plants for handling coal and ashes. They serve both as conveyors and elevators, encircling the elevated bunkers and the receiving track hopper.



An important feature of this carrier is the Turn-over Dump. The buckets turn completely over at discharge and thus successfully handle damp coal or ashes.



Upper Horizontal Run of "S-A" Pivoted Bucket Carrier, Tripper at rear discharging to bunkers.

THE B. F. GOODRICH COMPANY

Factories: Akron, Ohio

Representatives in All Districts.

Conveyor Belts, Elevator Belts, Transmission Belts

Manner of Construction

The type of construction of each belt is varied according to the nature of service required. The Goodrich organization has analyzed the performance of more mining belts in **actual field service** than any other manufacturer. We have combined our knowledge of relative "specifications" with that of **actual performance.** That means good **common sense, practical construction.**

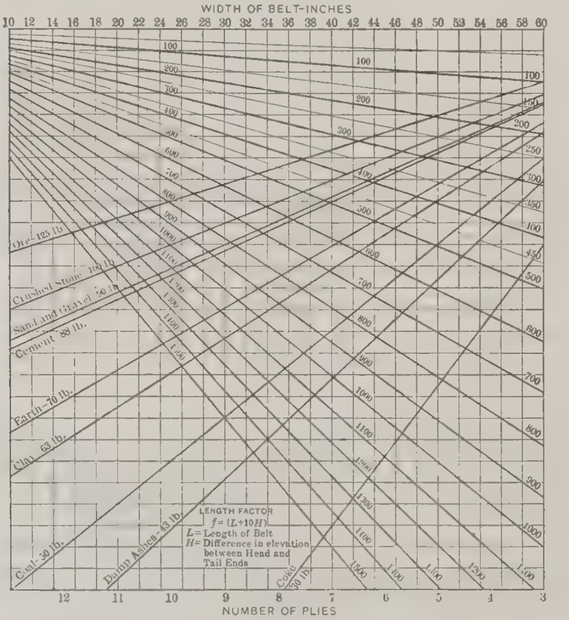
Conveyor Belting

The **Duck**—extraordinary tensile strength, longitudinally; much greater flexibility cross-wise than the ordinary ducks. Our special conveyor duck will trough as easily in the 8-ply weight as another belt in the 6-ply weight.

The **Friction** between the plies is of a good, substantial, elastic rubber. The strong elastic tendrils of rubber hold the plies together; keep their life and vitality during service.

The **Cover**—strong, wear-resisting, tenacious and resilient. Developed to prevent entrance of moisture and resist abrasion by the material handled and injury by blows of the material when delivered to it.

GOODRICH CONVEYOR BELT CALCULATING CHART.



Explanation—Start from the width of the scale at the left, move to the right until the proper length factor line is intersected. Then either up or down until the line corresponding to the material handled is intersected. Then to the right again for the next largest number on the scale indicates the correct number of plies.

If driving pulley is rubber lagged, multiply number of plies by 84-100 or 5-6; if tandem drive, bare pulley by 67-100 or 2-3; if tandem drive lagged, pulley by 55-100 or 11-20.

(Chart is for simple drive bare pulleys).

The **Edge** of our belts stay on until actually worn off. Will not peal off. The one-piece top cover is carried around the edge and into the back, where it is connected. This avoids any tearing point which is made when an extra piece of rubber is added to thicken the cover at the edge. Maximum adhesion at this point. Cured under stretch—no troublesome taking up of the belt when put in service. Runs straight and stays straight.

"Longlife"—an excellent belt for installations where service is continuous and particularly hard.

"Maxecon" for all ordinary service and installations under normal conditions.

Elevator Belts

The Duck—strong and durable. More than ample body for the bucket bolts to grip to securely. An improved friction compound holds plies together and keeps out moisture.

"Goodrich" Brand is of the friction surface type with a double thick gum cushion under the top ply on all sides of the belt. Resists puncturing and moisture either from service, wear or thru the bolt holes. Relieves internal stresses and gives belt more life. Highest quality for heaviest mining elevator work encountered.

"Akron" Brand is rubber covered, but has no gum cushion. An excellent belt for very heavy duty.

"Cost Cutter"—a strong belt for normal conditions.

Transmission Belts

"Commander" Brand — special duck — extra weight and body. Maximum tensile strength and a freedom from stretch without equal. Unusual flexibility. Strong gripping power afforded to fasteners and lacings. Friction of strong adhesion against ply separation. Retains life and protects duck from moisture. Heavy gum cushion under top ply affords special resistance to moisture and unusual degree of flexibility. Friction surface type —special high-grade friction—special heavy duck.

Most efficient for extreme of heavy transmission duty.

"Pinnacle" Brand—High-grade heavy service belt. Friction surface type. For driving jaw crushers, crushing rolls. General hard duty.

"Pilgrim" Brand — sturdy belt, plain and stitched, rubber covered type. For normal stresses, ordinary speeds and general operating service.

How to Establish Length of Endless Belt

To twice the distance from center to center of the pulleys add the sum of the diameters of the pulleys in feet, multiplied by 1.57. To this add the difference in the diameter of the pulleys, multiplied by itself and divided by four times the distance from center to center.

MAIN BELTING COMPANY

Philadelphia, Pa.

NEW YORK, PITTSBURGH, CHICAGO, SAN FRANCISCO

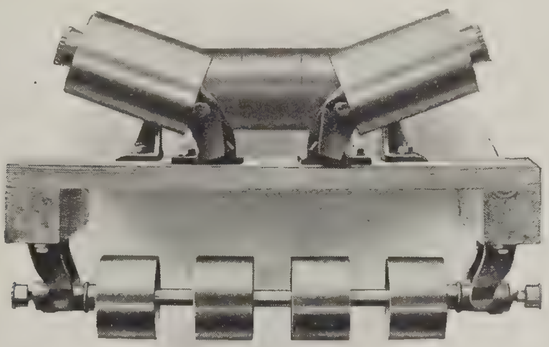
Main Belting Company of Canada, Ltd.,
Montreal Toronto

Products

Leviathan and Anaconda Belting, Main Adjustable Troughing Conveyor Rollers, Duck Brand and Blaxtick Belt Dressing.

Main Adjustable Troughing Conveyor Rollers

Built to eliminate all possible belt wear due to the rollers themselves. The importance of this may be judged from the fact that in many cases with ordinary roller equipment, belt wear is caused as much by wear of the belt on the rollers as by abrasive action of the material carried.



Main Adjustable Troughing Conveyor Roller.

Overly steep troughing angles, gaps at the troughing points, rigid bearings, imperfect lubrication, etc., undoubtedly tend to shorten the life of any belt used and are to be guarded against accordingly.

The absence of these faults in the Main Adjustable Troughing Roller results not only in increased belt service but the efficiency of the entire equipment is noticeably bettered.

Experience has shown that troughing a belt at greater than a 20° angle will not increase the carrying capacity sufficient to compensate for the accompanying extra belt wear.

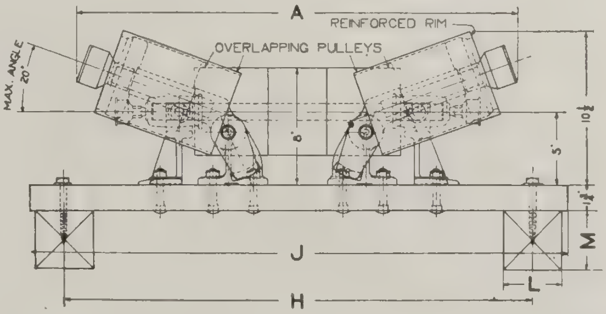
The Main Adjustable Troughing Roller is therefore made adjustable with a maximum angle of 20°.

The edges of the troughing and flat pulleys overlap, the troughing pulleys being so mounted that they overlap the edges of the end pulleys, making it impossible for the belt to come in contact with the edge of the pulleys at the bending point.

The shafting of the flat roller is suspended in babbitted swivel bearings which are in turn suspended from supports and adjust themselves to any warping of the stringers. **The shaft therefore cannot bind and cause the pulleys to cease to revolve.** A rigid roller quickly wears to a knife like edge over which the belt is dragged.

There is a comparatively long central pulley or roll to give highest possible carrying efficiency. **A large proportion of the belt runs flat** with the troughing point near the edge where the abrasive action of the material carried is slightest. This construction also steadies the belt and makes it run more evenly.

Lubrication is effected by the use of **individual compression grease cups for each bearing surface.** This gives positive lubrication and is unquestionably best adapted for the dusty conditions usually existing.



Main Adjustable Troughing Conveyor Roller. Line Drawing.

Shafting and pulleys are of the same diameter for all sizes of equipment, making necessary a very small number of parts for the maintenance of several conveyors of varying widths, and making it possible to increase capacity at any time simply by the use of longer shafting and the additional pulleys necessary for the greater width.

These same principles are embodied in the Main Flat Carrying Roller.

Installation

When installing a belt conveyor, the entire equipment must be carefully planned to meet the particular operating conditions encountered. Since these conditions are never exactly the same in any two cases, this Company maintains an Engineering Department, composed of men who have specialied on this particular work and who will co-operate to the fullest degree in designing new equipment or in developing ways for improving present installations. This service is without cost and without obligation.

CONVEYOR CAPACITY TABLES

Conveyors Troughed at 20 Degrees, Running at a Belt Speed of 100 Feet per Minute, with Material Fed Steadily to the Belt

Belt Width in Inches	Max. Size of Piece in Inches	Max. Belt Speed in Ft. per Minute	Uusual Belt Speed in Ft. per Minute	CAPACITY						
				Cu. Ft. per Hour	Bushels per Hour	Tons per Hour for Material Weighing "W" Pounds per Cubic Foot				
						W=50	W=60	W=80	W=100	W=150
12	2	300	200	256	206	6	8	10	13	19
14	2	300	200	370	297	9	11	15	19	28
16	3	300	200	505	405	13	15	20	25	38
18	4	350	200	655	530	17	20	27	33	50
20	5	350	250	830	670	21	25	33	42	62
22	6	400	250	1030	830	26	31	41	51	77
24	8	400	250	1240	1000	31	37	50	62	93
26	9	450	300	1480	1190	37	44	59	74	111
28	12	450	300	1740	1400	43	52	69	87	130
30	14	450	300	2020	1620	50	60	80	101	151
32	15	500	350	2300	1860	58	69	92	115	173
34	16	500	350	2625	2110	66	79	105	132	197
36	18	500	350	2960	2390	74	89	118	148	222

To find the capacity for belt speeds other than 100 feet per minute divide the value given in the table by 100 and multiply by the correct belt speed. If the material is fed very steadily by means of a mechanical feeder the capacity will be increased 15% to 20%.

ROBINS CONVEYING BELT CO.

MAIN OFFICE:
13-21 Park Row, New York City
Chicago Office, Old Colony Bldg.
Birmingham, Ala., C. B. Davis Eng. Co.

Engineers, Founders and Machinists

Manufacturers of

Belt Conveyors; Bucket Elevators; Unloading, Stocking, and Reclaiming Towers and Bridges; Screens; Coal and Coke Crushers; Castings; Conveyor Auxiliaries

Coal Unloading, Stocking and Reclaiming Equipment.

Robins Conveying System at a By-Product Coke Plant.

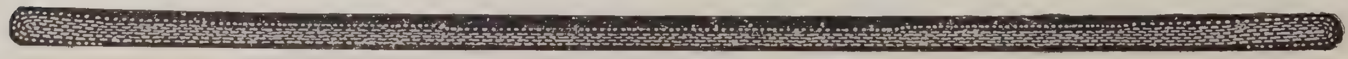
Conveyor Carrying Screenings from Tipple to Boiler House.

Coke Wharf at a Steel Plant.

Nearly all the large by-product coke plants in this country are using Robins Conveying Machinery, and the auxiliary equipment for handling and screening coal and coke. Our conveying machinery is effecting economies in every kind of work where it is necessary to handle material.

Send for our Illustrated Bulletins describing the Robins System.

We manufacture eight brands of conveyor belts, any one of which, when properly selected, will handle material more economically than the most suitable belt of other manufacture obtainable. Five of the brands are of the stepped ply formation, as shown below, and three are of the straight ply construction. Let us assist you in selecting the proper brand and construction for your work.



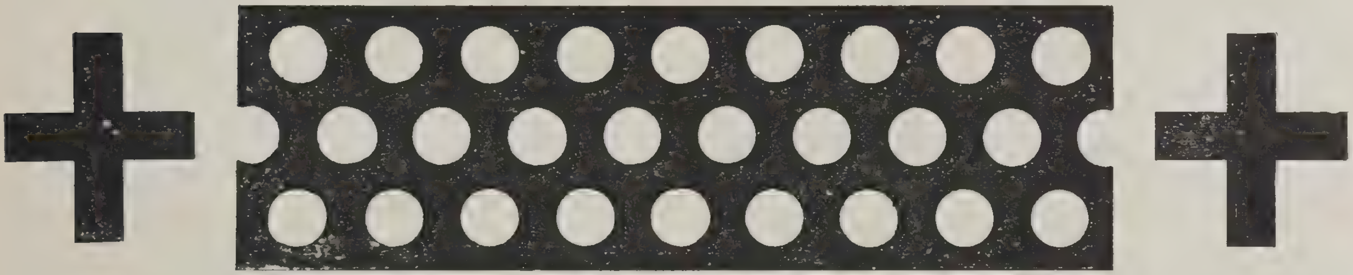
Cross Section of "Durabelt" Conveyor Belt.

CROSS ENGINEERING COMPANY

General Office and Works CARBONDALE, PA.

Manufacturers of

Perforated Coal and Coke Screens and Special Coal Preparing Equipment



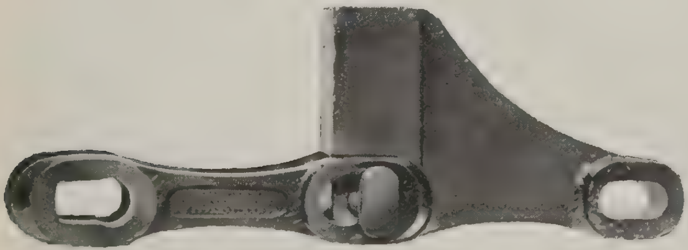
Products

We specialize in the manufacture of Perforated Metals, plain and fabricated, for Coal, Coke and Stone Product operations. Our Acid-Resisting Manganese Bronze Screens and other perforated products enjoy a reputation for accuracy to mesh and general high quality. We make complete

- Shaking Screens,
- Conical Screens,
- Cylinder Screens,
- Cross Flanged Lip Screens,
- Kerrigan Slate Pickers,
- Mowry Bar Slate Pickers,
- Angle and Grizzly Screens,
- Coal Yard Screens, Etc.
- Plain Steel Elevator Buckets,
- Perforated Elevator Buckets,
- Conveyors, Flights, Trough, Etc.
- Elevators and Casings,
- General Sheet Steel Work.

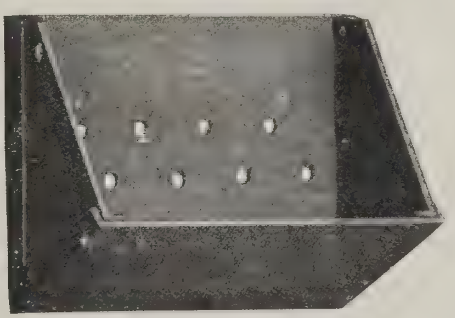
Simplex Rivetless Chain

We show below Car Haul Type of our Simplex Rivetless Chain. This chain, connected without tools, and interchangeable throughout, with reversible pins, is operative over both sprockets and tractions either inside or double outside drive. Made of drop forged and manganese steel or malleable iron, with conveyor elevator and car haul attachments. Over 30000 ft. in operation.



We specialize in the manufacture of plain and perforated elevator buckets in all shapes and capacity. These are made to order as specified.

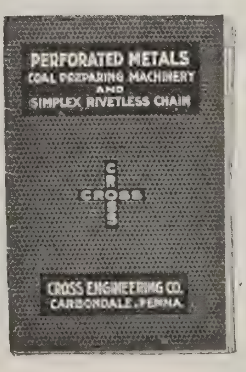
See catalog for shapes and capacity.



Ask for this catalog. You will find it a very convenient handbook for reference in specifying.

We carry a large stock of blank sheets and plates, insuring prompt shipments.

Your inquiries solicited.



PERFORATED METALS
COAL PREPARING MACHINERY
AND
SIMPLEX RIVETLESS CHAIN

CROSS

CROSS ENGINEERING CO.
CARBONDALE, PENNA.

HENDRICK MANUFACTURING CO.

General Offices and Works
CARBONDALE, PA.

"Your Product Will Be Clean If You Use a 'Hendrick' Screen."

Perforated Metal Screens for Breaker and Tipple.

Elevator Buckets, Flights and Pans
General Sheet Iron Work.

Products

Perforated Metals for Shaking Screens, Revolving Screens, Jig Screens, Conical Screens, Bradford Breakers, Coal Crushers.

With the most modern equipment we are in a position to execute your orders for screens in a very satisfactory manner.

We perforate steel, (black or galvanized) brass, copper, American Ingot Iron, also **Manganese Bronze which resists the action of sulphurous mine waters.**

Holes round, square, oblong or slotted. Sizes to 8″ dia. and 6″ square, inclusive. Variations in thickness of metal from No. 30 U. S. Std. gauge to 1″ thick inclusive, determined by size of perforations.

Plates flat; ends and sides flanged up or down, with bolt holes for attaching to shakers; rolled to diameter or radius for revolving and conical screens, butted or lap joints.

Perforated Elevator Buckets

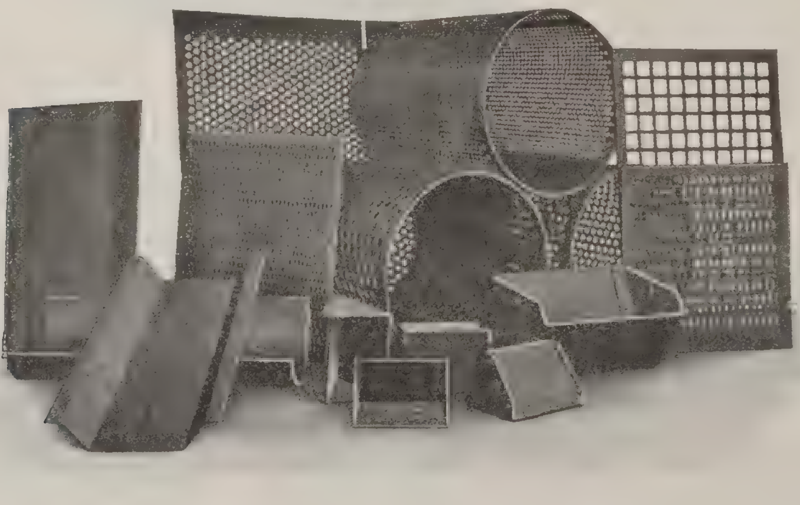
for Stewart and Luhrig Elevators, or any slush line.

Elevator Buckets

All sizes and descriptions. Send us your inquiry or order.

Double Beaded Pans and Flights

for Apron Conveyors, Picking Tables and Loading Booms.



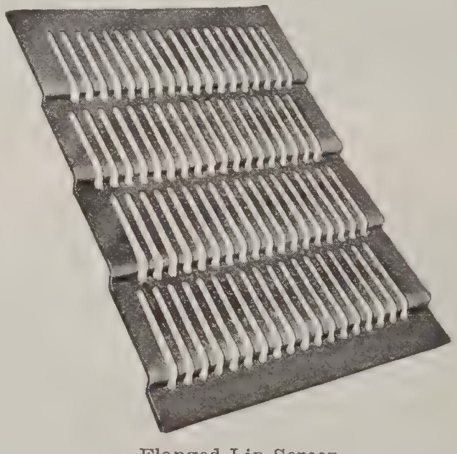
Made by "Hendrick."

Conveyor Flights and Pans

for Scraper Conveyors.

Stock Plates and Sheets

We carry a very large and complete stock of blank plates and sheets ranging from No. 22 U. S. std. gauge to ½″ thick, inclusive, enabling us to furnish promptly all orders for standard sizes.



Flanged Lip Screen.
Sole Manufacturers.

Our Patent Flanged Lip Screen

Used successfully in the Anthracite and Bituminous Regions, as a flat slate picker, on shaking screens, in telegraphs, under revolving screens and as a lip screen at loading chutes. It does the work. **It has no superior as a tipple screen, or a breeze screen for coke.**

Hundreds of satisfied users.

Write for circular No. 23.

Catalog

If you haven't a copy of our catalog we shall be glad to send one.

Our experience of over thirty years is at your command.

We will be glad to receive your valued orders or quote on your inquiries.

REMALY MANUFACTURING CO., INC.

TAMAQUA, PA.
Manufacturers of
Perforated Sheet Iron Screens of All Descriptions, Elevator Buckets,
Cellar Doors and Coal Chutes.

New and Improved U-Dent Shaker Plate

(Patented 1915)

U-Dent Shaker Plate

The features of this Shaker plate which appeal to the practical mine operator are many, among them being features rather different from any other plates for this purpose. This U-Dent Shaker Plate patented during the present year spreads the material to be screened uniformally over the plate instead of permitting part of it to travel over in bulk form. This naturally assists in quicker and more even operation.

The riffles which are a features of the plate impart a rolling movement to the coal and this combined with the spreading features assists the finer sizes to readily work their way through the coarser. By actual test it has been shown that this increases the efficiency fully 35%.

The usual perforated plat of 36″ x 72″ contains from ⅝ to ¾ of an inch expansion which causes the plate to bag. The "U-Dent" idea, however, takes up this expansion without stretching or destroying the fibre of the metal.

Monel Metal as used for these plates is especially valuable in that it retains its brilliancy and becoming smooth as well as bright allows the material to run over the screen very rapidly.

The "U-Dent" feature retards the movement sufficiently to cause the proper screening action.

The illustration at the bottom of this page shows one of these plates with its riffles and "U-Dent" feature. Mine operators who have installed Monel Metal screens and other articles of this valuable material have found that it gives the greatest satisfaction. Being non-corrodible and having the ability to withstand dampness, gases, etc., without rusting makes it highly valuable for all such purposes.

Chemical Tests on Monel Metal

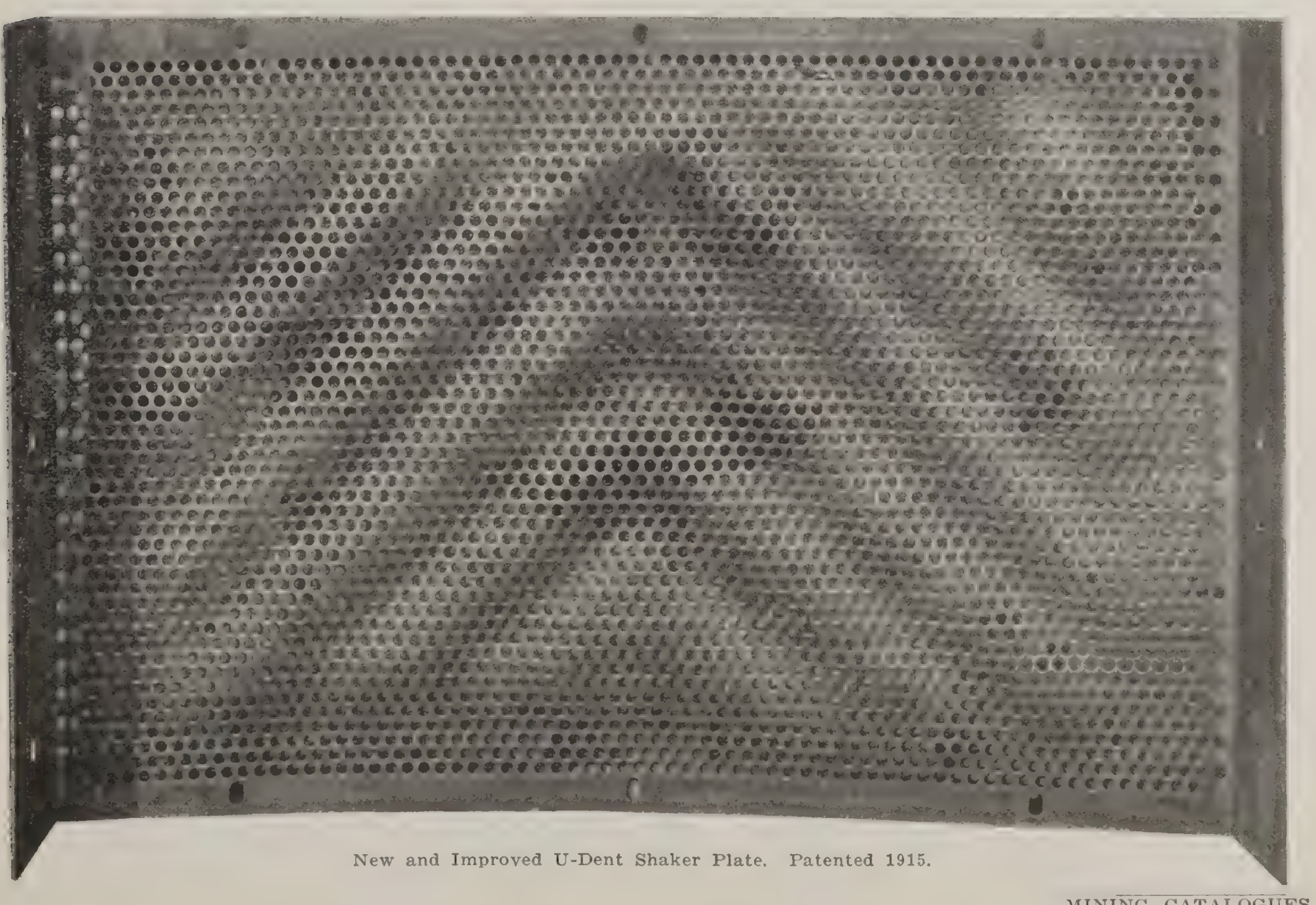
Some very acid mine water was dropped for six days continuously on a plate of Monel Metal and also on a similar one of iron.

This water contained 0.04 per cent. of free sulphuric acid. The iron soon showed the effect of the acid water. The Monel Metal was unaffected, but it was stained by a slight deposit from the evaporated water.

Inquiries

Send us your inquiry with blue print or full specifications (stating whether the plate is flat or flanged) and we will be glad to quote you prices.

We keep a variety of these plates on exhibition in our shops and would be glad to have you call and see them.



New and Improved U-Dent Shaker Plate. Patented 1915.

TAMAQUA MANUFACTURING CO.

Manufacturers of

Improved Machinery for Coal Handling and Preparation

Tamaqua, Penna.

The Christ Patent Jig for Anthracite and Bituminous Coal

More than 1200 of these machines have been successfully installed. They are carefully designed, and well constructed, insuring capacity, efficiency and economy of repairs.

The refuse discharge is automatic and is controlled by adjustments capable of the most sensitive and positive regulation.

The discharge elevators can be extended to any height desired. The drive is by belt or rope from Line or Counter Shaft. When so desired we make the machine direct connected to Engine or Motor.

Anthracite Jig

The accompanying cut represents our 1911 model Anthracite Jig. It is of the reciprocating pan type.

The tank is built of White Pine or Yellow Pine, well constructed and tied together with rods, and is much less liable to strains and leakage than tanks of the plunger type of jigs.

Specifications

Tank: White or Yellow Pine; 8" x 8" sills and caps; 6" x 6" posts; 3" surfaced plank sides, ends and bottom lined with ⅞" W. P. Tongued and grooved flooring.

Pan: Cast iron in one piece, without joints.

Shafting: Machinery steel.

Drive: Pulley or sheave with 10 H. P. Friction Clutch. 7" x 8" Vertical or Horizontal Engine or 10 H. P. Motor direct connected, on special order.

Elevators: Cast iron interlocking buckets for regular specification; steel perfect discharge buckets and all steel chain on special order.

Grates: Cast iron or bronze.

Eccentric Arms: W. I. Forgings with babbitted journal box; W. I. Straps and steel take-up key.

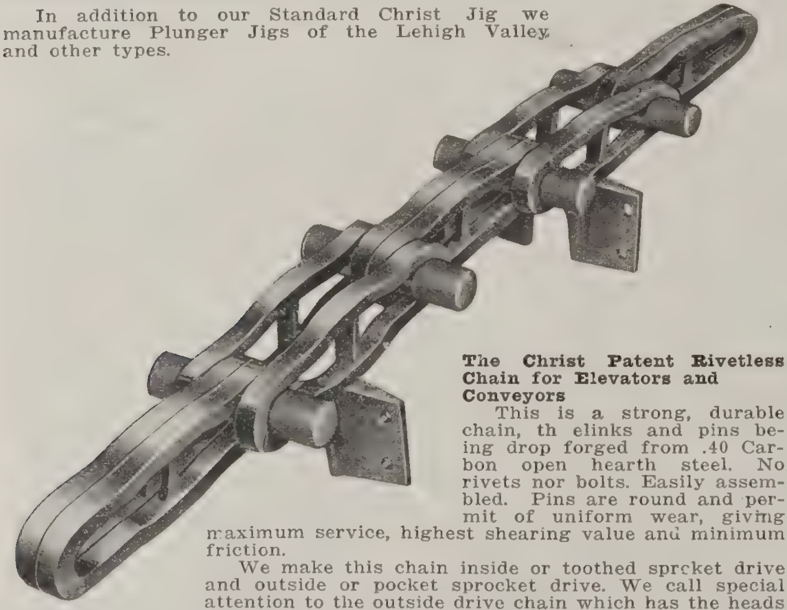
Size of Jig	Capacity Tons per Hr.	Approx. H. P. Con.	Water Gal. per Hr.	Size of Tank			Approx. Shipping Wt. Lbs.
				Length	Heighth	Width	
3 foot	8 to 12	4	300	11′ 8″	6′ 11¾″	5′ 4½″	11,600
4 foot	12 to 16	5	400	11′ 8″	6′ 11¾″	6′ 3 ″	13,800

Bituminous Jig Washer

Our Bituminous Jig Washer is a modification of our Anthracite Jig. This machine is provided with a rear elevator for reclaiming fine materials. It is also provided with water circulating arrangement, avoiding the necessity of using pump or settling tank. General specifications are similar to those for our Anthracite Jig.

Size of Washer	Capacity Tons per Hr.	Approx. H. P. Con.	Water Gal. per Hr.	Size of Tank			Approx. Shipping Wt. Lbs.
				Length	Width	Heighth	
3 foot	15 to 20	5	450	13′ 0″	5′ 3″	7′ 3″	18,000
4 foot	25 to 30	8	600	14′ 6″	6′ 3″	7′ 3″	20,500

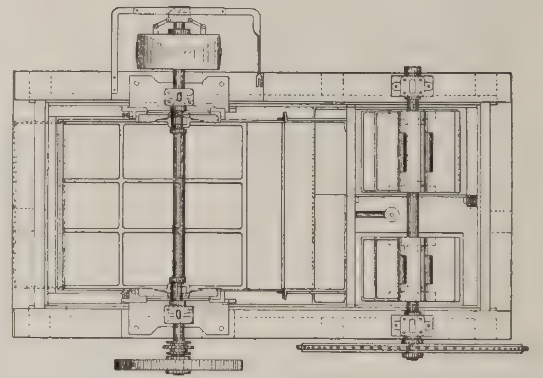
In addition to our Standard Christ Jig we manufacture Plunger Jigs of the Lehigh Valley and other types.

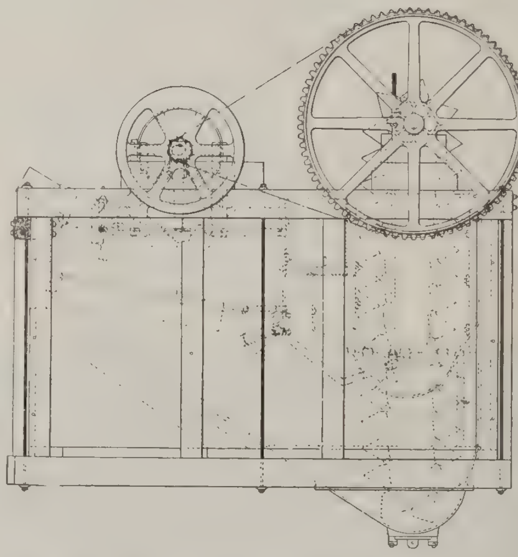


The Christ Patent Rivetless Chain for Elevators and Conveyors

This is a strong, durable chain, th elinks and pins being drop forged from .40 Carbon open hearth steel. No rivets nor bolts. Easily assembled. Pins are round and permit of uniform wear, giving maximum service, highest shearing value and minimum friction.

We make this chain inside or toothed sprocket drive and outside or pocket sprocket drive. We call special attention to the outside drive chain which has the heads of the pins extended to engage in the sprocket. This arrangement avoids the tooth wear on the backs of links, and gives more shearing value as well as less vibration to the chain.





Elevating and Conveying Machinery

We manufacture a line of elevating and Conveying Machinery for light, medium and heavy duty—Riveted or Rivetless All Steel Chain and Malleable Iron Chain.

Crushing Rolls

Steel inserted tooth; manganese segment; open hearth steel segment; chilled tooth cast iron segment, and solid body cast iron.

All sizes. Simple and compound.

Screens

Shaking and revolving screens and screen bars.

Picking Tables, Chute Gates, Car Hauls, Dumps, Etc.

Power Transmission Machinery

We make a line of manilla rope transmission and idler sheaves, belt pulleys, journal boxes, shafting, collars, gearing, tension carriages, etc. This machinery is specially designed for colliery use.

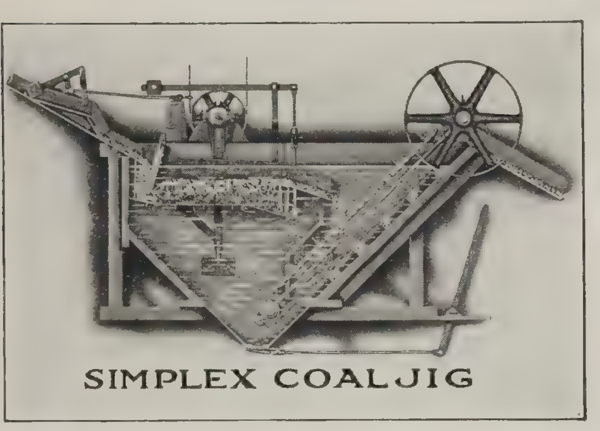
Chain No.	Pitch Ins.	Dia. of Pins Ins.	Width of Outside Links	Width of Inside Links	Breaking Strain. Lbs.	Working Strain Lbs.	Price Per Foot.	
							Inside Drive	Outside drive
144	4½	¾	7/16″	⅞″	48,000	9,600	1.07	1.07
121	6	1⅛	½″	½″	100,000	20,000	1.35	1.45
110	6	1⅛	¾″	¾″	106,000	21,200	1.45	1.55
108	9	⅞	½″	½″	60,000	12,000	.90	.90
107	9	1⅛	¾″	¾″	106,000	20,000	1.20	1.30

Attachments extra. Above prices subject to discount.

WILMOT ENGINEERING COMPANY

Works: White Haven, Pa. HAZLETON, PA.,

Improved Breaker Machinery



For Anthracite Coal.

This Jig is, as its name implies, simple in construction and operation, yet in the performance of its work there is none more efficient and its marvelous capacity is equal to that of larger and higher priced Jigs and the maintenance cost much lower.

The satisfactory performance in the several places it has been installed in the past year has earned for it a very enviable reputation as well as the endorsement of many mining superintendents and engineers of the anthracite coal field.

Lloyd Compound Gear Driven Rolls

Correct speed, and greatest capacity. Perfect mechanical construction throughout. Every emergency provided for.

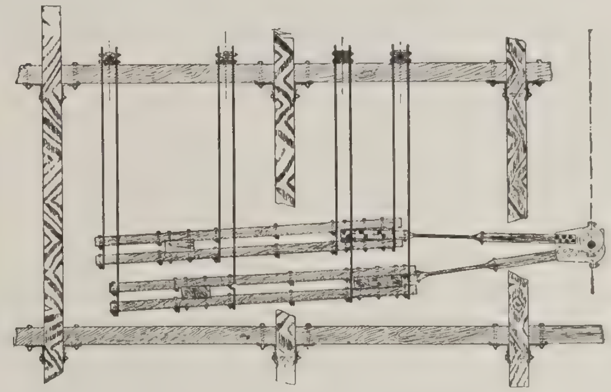
Guarantee

Maximum tonnage in prepared sizes. Minimum loss in breakage. In three sizes:

24″ Diam. x 28″ Long. 36″ Diam. x 46″ Long.
36″ Diam. x 34″ Long.

The Parrish Flexible Arm Shaking Screen

The best type of screen made for use in the coal breaker, soft coal tipples or sand and gravel installations. Less vibration and greatest efficiency of any shaker screen ever used.

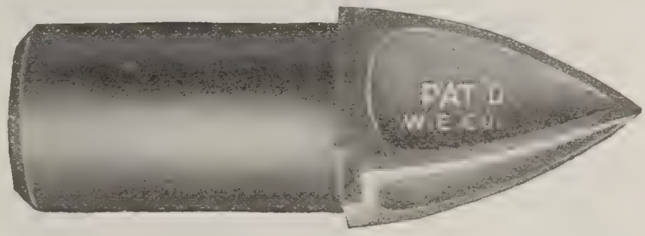


The Parrish Shaker—(Patented)

Lowest installation and operating cost. Simple, strong and durable. Can safely be installed in old breakers.

Our Hollow Ground Roll Teeth

These hollow ground roll teeth, made in Drop Forged Steel for the inserted tooth roll and Manganese Steel for the segmental roll, are now being extensively used for the preparation of anthracite coal.



The keen cutting edges, which is the business end of the roll, do the work more efficiently than any other shaped tooth. Made in three sizes.

Try them and be convinced.

Keystone Rivetless Chains

The strongest per cross section area.

The cheapest from service point of view.

The only Rivetless Chain designed and built along straight lines, thus insuring maximum strength and minimum wear and preventing distortion of the links, and change of pitch.

Possesses all the advantages of any other rivetless or riveted chain.

Note the rugged bull-dog construction of the pin-head—a positive guarantee against acid waters, wear and tear.

Made in Drop Forged High Carbon Steel, Manganese Steel and Malleable Iron in sizes as follows:

Pitch	Diam. of Pin	Malleable Iron No.	.40 H. C. S. Drop Forged No.	List Price Per Foot Subject to Discount.			Weight per Foot	Approximate Breaking Strain
				Malleable	Drop. Fgd.	Manganese		
3	⅝	358		.60			5.	16,000
4	⅝	458		1.00		4.00	5.75	20,000
6	1⅛	698		1.20			10.1	42,000
9	1⅛	998		1.16			8.24	42,000
6	⅞		678		1.30		5.92	60,350
6	1⅛		698		2.00	3.50	10.72	100,000
8	1⅛		898		1.80		9.6	100,000
9	1⅛		998		1.60	3.00	8.46	100,000
9	1⅜		9118		3.00		15.7	200,000

Phillips Mine & Mill Supply Co.

ESTABLISHED 1863.

Pittsburgh, Pa.

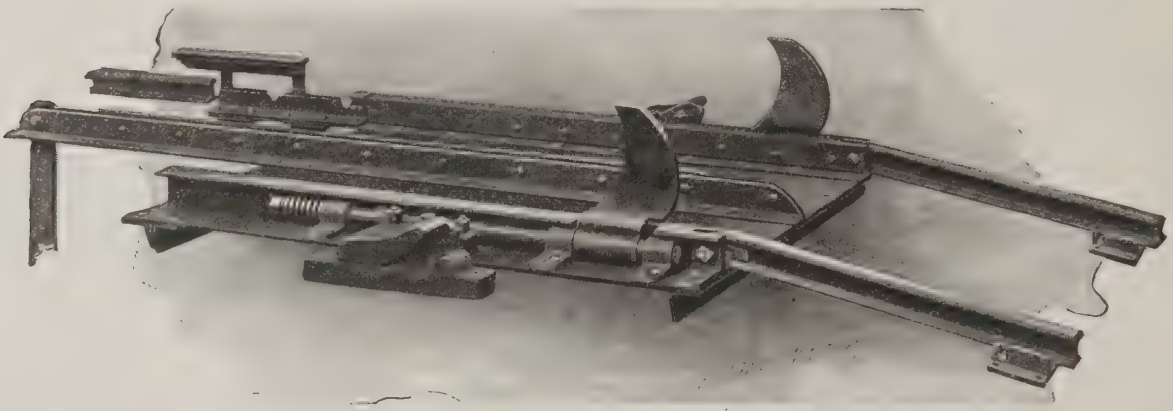
Mine and Coke Works Equipment

Agencies:

SEATTLE: A. F. Blair, C. & M. E.
SALT LAKE: Utah Eng. & Machy. Co.
HUNTINGTON, W. VA.: Miller Supply Co.
LETHBRIDGE, CAN.: J. B. Turney & Co.

Products

Mine Cars, Mine Car Wheels and Trucks, Screens and Screening Equipments, Larry Wagons, Incline Drums, Car Hitchings, Frogs and Turnouts, Automatic Car Stops and Caging Machines, and the Phillips Automatic Cross-Over and Automatic Push-Back Car Dumps.



The Phillips Automatic Cross-Over Car Dump

This Dump is so generally known and so widely distributed that it is now recognized as the standard device of its kind, and it is used in all the coal mining fields throughout the United States, Canada and Mexico.

Capacity

The capacity of the Dump is practically unlimited, and it will handle the cars as rapidly as they can be brought to it, a number of operators dumping from 3,000 to 6,000 tons per day over one Dump, at the rate of 5 to 12 cars per minute. We have calculated that if all the Dumps we have installed of this type were run to anywhere near their capacity they could handle with ease the entire coal output of the world.

Construction

The Dump is very substantially constructed to stand rough usage and heavy service, and it can be installed by any carpenter or mechanic from setting plans we furnish. The horn shafts are provided with heavy adjustable buffer springs, which absorb the jar caused by the loaded car striking the horns, thus prolonging the life of the rolling stock, as this feature prevents wheels from being cracked or axles thrown out of alignment. The base of the Dump is a heavy steel plate to which the rails, brake pole and operating mechanism are securely attached.

The construction and price of the Dump varies with the guage of track and weight of the loaded car, and we have built Dumps to handle cars weighing from 2,500 lbs. to 15,000 lbs. loaded. In order to build the Dump and guarantee its operation, or even to quote prices, we always require a drawing of the car which is to be used in connection with it. If more than one style of car is used, a drawing or sketch of each car should be furnished.

We have built most of the up-to-date tipples in Western Pennsylvania, and are always glad to advise on contemplated installations. Your inquiries are solicited.

DEMPCY - DEGENER COMPANY

PITTSBURGH, PA.

Contracting Engineers

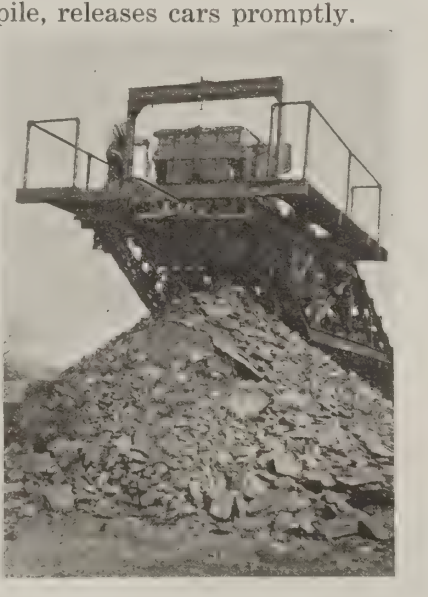
Transmission, Conveying and Elevating Machinery

Products

We design and construct Saxon Moveable Slate Dumps (Patented); Coal Tipples, Coal Washeries; Coal Bunkers; Belt Conveyors; Drag Conveyors; Bucket Elevators; Flight Conveyors; Skip Hoists; Car Hauls; Pivoted Bucket Conveyors; Electric Tramways; Crushers; Screens; Larries; Automatic Weighing Equipments.

Saxon Moveable Slate Dump (Patented)

for economical handling of mine refuse. Saves labor, eliminates all timbering, reduces space required for refuse pile, releases cars promptly.



The Saxon Movable Slate Dump consists of a Movable Cantilever tipple, which overhangs the dump and deposits the dumping sufficiently far ahead so that it makes its own roadbed. It is fitted with an electric rope hoist having a drum capacity of approximately 2000 of wire rope, which hauls the loaded cars from any convenient point, dumps them and delivers them back to the empty track. It is possible for two men to dump slate at the rate of from 20 to 40 cars per hour. In other words, the machine hauls and dumps the cars, and with it one or two men should easily handle all the slate under ordinary conditions.

The dump may be operated on a steep incline, thus very largely increasing the capacity of a given piece of property for the storage of refuse.

It is possible to handle on this machine either the mine cars themselves or else to dump the mine cars into a chute or bin and from this load the refuse into Monitor cars, which are then hauled and dumped by the machine.

When it is desired to form a pile wide at the top, steel spreading plates are attached to the frame at the point where the car is dumped.

Special advantages of the Saxon Moveable Slate Dump are:

It is almost never necessary to use more than two men for handling the entire output of refuse at the mine. In case the amount is small and length of haul short, one man can easily do the work.

The two regular operators can move the dump forward when it becomes necessary, level the roadway and lay tracks in about one and one-half hours.

The control of the machine is where it should be, i. e.—at the dumping point, enabling the operator to take care of any difficulties which may come up, such as choking of materials in cars, etc., as well as avoiding the danger of running the cars off the pile in cases where the hoisting machinery is distant from dumping point.

The following table shows the capacity of a few of our numerous installations

Model	Machine No.	INSTALLED FOR	Wt. Cars Loaded (Pounds)	No. Cars Handled per day	Rope Speed (Feet per minute)	Motor H. P.	Ultimate Length Haul	Grade of Pile	No. of Men Required
B	1	Carnegie Coal Co. Primrose Mine. Primrose, Pa.	6000	161	400	25	450′	15%	2
C	1	Carnegie Coal Co. Charleroi Mine. Charleroi, Pa.	12000	120	300	25	400′	10%	2
C	2	J. H. Sanford Coal Co. Armide Mine, Raccoon, Pa.	10000	120	300	25	400′	10%	2
D	1	Cowanshannock Coal & Coke Co. Yatesboro Mine. Yatesboro, Pa.	5000	225	500	33	500′	20%	2
E	1	Pittsburgh & Erie Coal Co. Erie Mine No. 1, Burgettstown, Pa.	7000 12000	200	500	25	500′	25% 5%	2
F	1	Jamison Coal & Coke Co. Mine No. 4, Crab Tree, Pa.	13000	150	300	40	500′	30%	2
G	1	National Mining Co. Nat. Mine No. 1, Sygan, Pa.	8000	180	750	66	650′	33%	2
D		Jamison Coal & Coke Co. No. 3 Plant, Forbes Road, Pa.	9000		300	20		15%	2
D		Jamison Coal & Coke Co. No. 2 Plant, Forbes Road, Pa.	9000		300	20		15%	2
D		Jamison Coal & Coke Co. No. 6 Plant, Hannastown, Pa.	9000		300	20		15%	2
H		Upper Lehigh Coal & C. Co. Upper Lehigh Colliery, Up. Lehigh, Pa.	11000		300	30		15%	2
H		Clyde Coal Co. Clyde Mine, Fredericktown, Pa	9000		300	25		15%	2
H		Allegheny River Mining Co. Cadogah Mine, Cadogan, Pa.	6000		300	25	800′	20%	2

Dump installed, Carnegie Coal Co., Charleroi Mine, Handling 125 cars per day, 10% grade.

THE FAIRBANKS COMPANY

Write Our Nearest Branch

ALBANY, N. Y.
BALTIMORE, MD.
BOSTON, MASS.
BUFFALO, N. Y.
HARTFORD, CONN.
NEWARK, N. J.
NEW ORLEANS, LA.
NEW YORK, N. Y.
PHILADELPHIA, PA.
PITTSBURGH, PA.
PROVIDENCE, R. I.
SYRACUSE, N. Y.

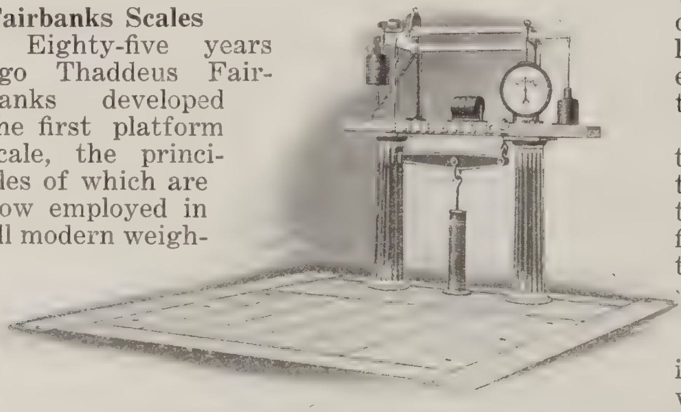
Manufacturers & Dealers

Scales of All Kinds, for All Purposes

Products

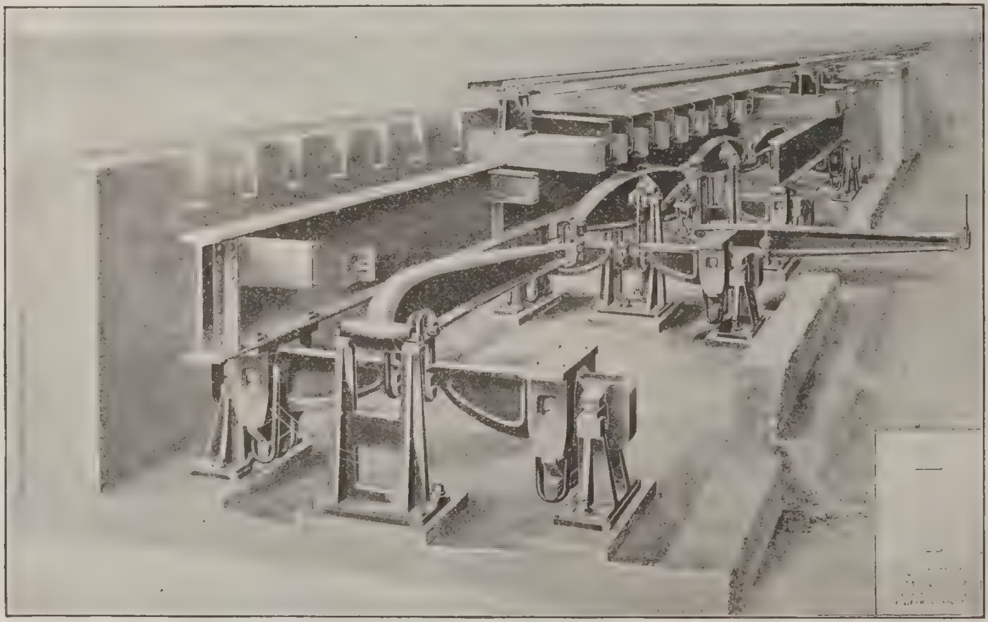
Scales, Valves, Trucks, and Wheelbarrows, Gasoline Engines, Pumps, Ventilators, Electric Light Plants, Power Transmission Machinery, Machine Tools, Power Hammers, Supplies.

Fairbanks Scales



Built-In Type with Quick Weighing Dial.

Eighty-five years ago Thaddeus Fairbanks developed the first platform scale, the principles of which are now employed in all modern weighing machinery. During these eighty-five years the name **Fairbanks** has stood for superior weighing machinery.



For weighing coal from the mine to the consumer, the three types of scales herein described are indespensable.

Coal Tipple Scale

The operation of the coal mine is dependent upon its tipple scale more than any other single piece of machinery used. This scale fixes the labor cost to the operator and measures the out-put of the mine. It is the place where interests of owner and miner meet. The scale should protect both and it can do so only through consistent accuracy which is obtained only in **Fairbanks** scales.

The tipple scale is sometimes built into the tipple, having a weighing hopper suspended from its levers to take the coal directly from mine cars, whence it is screened into the railroad cars below; or, it may be of the built-in type which is set directly into the ground or floor so that the loads may easily come onto the platform to weigh the coal in the mine cars.

To facilitate the weighing operation in order that the weight of the coal, either in the car or in the hopper, may be equickly shown, most scales of this type are equipped with a quick weighing outfit which consists of a dial attached to the end of the beam.

Railroad Track Scale

After the coal is delivered into the railroad cars it must again be weighed to determine the billing weight.

The Fairbanks Suspended Platform Track Scale is recognized by all large railroads and mining companies as the standard for this purpose. It is by far the most highly developed weighing machine on the market, conforming in detail to all the requirements of the American Railway Association.

Auto Truck Scales

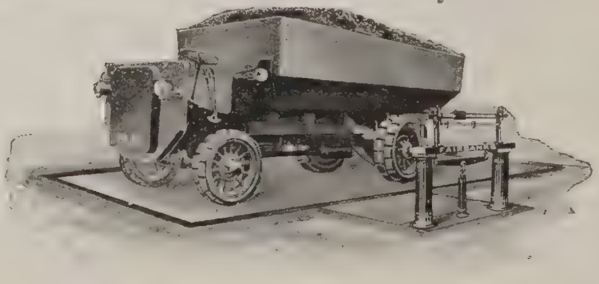
Before the coal is delivered to the consumer it must be weighed by the retailer. Here again accuracy is paramount and the need is supplied by **Fairbanks** Auto Truck or Wagon Scales.

All the scales described above are made in various modifications to meet local conditions.

In addition we have over one thousand other types for weighing other commodities.

Complete information and catalogs mailed on request.

If you have a special weighing problem we offer the counsel of our organization of experts, and our eighty odd years of experience is at your service.



THE HOWE SCALE COMPANY

Offices:

PITTSBURGH, CLEVELAND, CHICAGO, ST. LOUIS, CINCINNATI.

Manufacturers of

Howe Ball Bearing Scales The "EVERLASTING" Kind

Products

Scales, Trucks of All Kinds, Barrows, Coal Handling Machinery, Fire and Burglar Proof Safes, Refrigerators, and Cold Storage Rooms, Complete Store Equipment, Etc.

The Howe Ball Bearing Scales

This Principle Eliminates the Wear in Scales

When the first scales intended for heavy weighing were produced, nearly three quarters of a century ago, the manufacturers quickly discovered that their greatest problem was, not making scales that would weigh accurately, but constructing them so they would remain accurate and sensitive for a reasonable length of time after being put in commission and sujected to the unavoidable severity of commercial use. To obtain accuracy and sensibility, it was essential that the knife edges or pivots in the levers be made sharp and accurately gauged, which in itself was readily obtained by careful mechanical process, but even the most careful and skillful tempering of the pivots was of no avail as against the destructive grinding and battering motion of the weigh platform. Thus the axiom was established, that a scale is accurate and sensitive only while its pivots are sharp, and naturally it follows that the life of any scale is merely the life of its pivots.

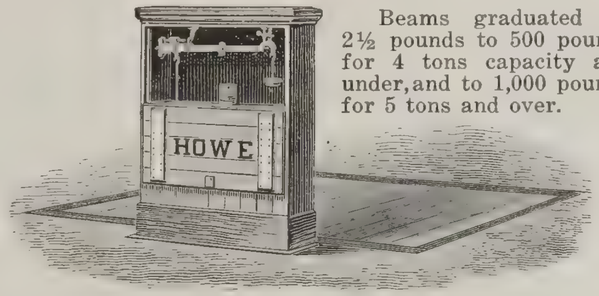
If the pivots were made heavy enough in size and obtuse as to edge, to adequately care for the severity of their use, the very essential attribute of sensibility would be lost, and with it the fine degree of accuracy as required for commercial use. Such construction is of course impractical. It is also important that the weigh platform remain in one position on the knife edges, without shifting its bearings. Otherwise the platform might work over against the frame, causing incorrect weights, or even slide off of the pivots entirely. The primitive remedy for both of the ills mentioned was the "check rod" which prevented to some extent the ruinous motion of the platform, and this method is still used by some scale manufacturers. Eight check rods are generally used, connecting the weigh platform to the rigid frame or wall. Obviously if these rods entirely prevented the platform from moving, the scale could not weigh, and thus a considerable amount of direct grinding on the knife edges is permitted, while the tendency of the platform to bind and clog is continually causing friction. Thus it is apparent that the check rods only partially serve their purpose, and at the same time are a source of trouble in themselves, often causing incorrect weights.

The problem was really solved when Howe conceived the idea of a ball bearing weigh platform. Chilled iron balls were placed in suitable sockets between the platform and the bearings on the knife edges, securing perfect freedom for the platform without connection of any kind with the rigid frame or wall. When the load strikes the platform it causes a swaying or rolling motion on the balls which act as shock absorbers, while the bearings under the balls remain in a stationary position on the knife edges. The harmful lateral grinding motion produced on the knife edges in the older type of direct bearing scales is entirely eliminated, and thus as a result of the ball bearing protection, the life of the pivots is greatly prolonged. The knife edges stay sharp and the scale stays accurate and sensitive. The rolling motion of the platform is quickly overcome due to gravity, the balls rolling back to the center of their cup shaped sockets, and thus the other important duty is performed of keeping the platform in normal position for weighing. The balls are a perfect centering device.

In wagon and other types of scales used in exposed locations, this rolling motion of the platform tends to keep the platform from freezing up in cold and sleety weather, while it also frees itself from lumps of coal and dirt which has a tendency to accumulate between the edge of the platform and the wall of the pit. This characteristic is naturally of special interest to the coal trade.

Miner and Transportation Scales

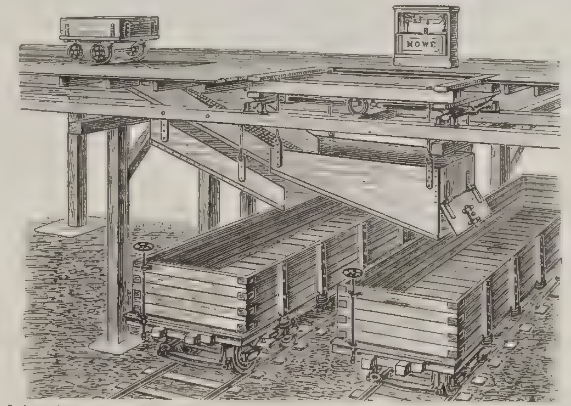
These Scales are designed for weighing small cars of coal, ore, etc., and are also used at factories for weighing heavy machinery and other articles. Scales of other sizes or different proportions are made to order at corresponding prices.



Beams graduated by 2½ pounds to 500 pounds for 4 tons capacity and under, and to 1,000 pounds for 5 tons and over.

Coal Tipple Scales

These Scales are designed for weighing coal at mines as it comes from the screens and before it passes into the cars on shipping track. The hopper is suspended from the Scale, so that when the door is opened the coal discharges direct into the cars. We furnish Scales for this purpose of sizes from 6 x 4 feet upward, and capacity from 2 to 12 tons.



Prices and plans furnished on receipt of specifications covering capacity wanted, size of hopper used, etc.

Railroad Track Scales

The latest Extra Heavy Iron Frame Howe Track Scale contains every improvement known to modern science in the manufacture of heavy weighing machines.

Automatic Springless Portable Scale

A very convenient type of scale where high capacity, with arrangement for setting off tare weights is desired. The tare bar poise may be set and locked, and the capacity bar brought into use whenever the size of the load requires it.

The Standard Scale and Supply Company

PITTSBURGH, PA., 1631 LIBERTY AVENUE

NEW YORK
145 Chambers St.

PHILADELPHIA
35 S. Fourth St.

CHICAGO
1345-47 Wabash Ave.

CLEVELAND
1547 Columbus Rd.

Manufacturers of

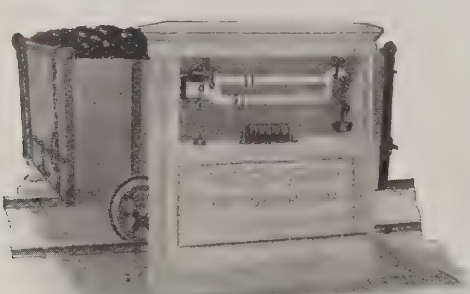
Weighing and Mixing Machinery

Products

Scales; Concrete Mixers; Engines, gas, gasoline and oil; Hoists; Coal Dealers' Supplies; Contractors' Equipment.

"The Standard" Modern Railroad Track Scale

Manufactured in capacities of from 6 to 300 tons and lengths of platforms running from 6 ft. up. On account of the arrangement of tipples it is frequently necessary to place two or more cars on the Scale platform at the same time. We are prepared to furnish a specially heavy type where the Scale is called upon to perform particularly heavy duty, or where it is necessary for a locomotive to pass over it. With the lighter pattern, a dead rail is usually provided. A single full capacity beam, graduated from 20 lbs up to the capacity of the Scale, either with or without Recording Attachment, is usually furnished. Double, Triple or special beams are frequently used and we are prepared to meet all demands.



"The Standard" Mine and Tipple Scale

Capacities 2 to 10 tons. Platforms of any size to accommodate mine cars. Usually furnished with Double Beam. Full capacity compound beams, either with or without Recording Attachment, furnished, if desired. This style can be erected either in tipple or on foundation in the ground.

"The Standard" Suspension Tipple Scale

for weighing coal after being dumped in the pans. Capacities 6 to 20 tons regular, although larger capacities are furnished when specified. The beams furnished are the same as furnished with the Mine and Tipple type. Extensions to locate the beam at any distance desired, and either above or below the mechanism.

General

"The Standard" line of scales includes practically all types for every purpose, in sizes from the small Counter graduated so fine as 1-16 ounce up through the general run of Express Package, Portable Platform, Dormant, Mine, Wagon, Auto-Truck, etc., to Railroad Track Scales of the heaviest capacity and longest platform.

Testing

A Scale, to retain its original accuracy, requires its share of attention like every other machine. As a rule, Scales of the heavier type are located in the open, subject to the weather and dirt. The Scale should be tested every thirty days. A supply of U. S. Standard Test Weights regularly placed upon the Scale to determine its accuracy is advisable. To insure that your Scale Equipment lives as long as it should, the Scales should be gone over by a competent Scale Mechanic at least six times a year. A little adjusting when needed often avoids the necessity of discarding the old and installing new equipment. Our Special Service Department is at your service. Write us for complete information regarding this service which adds efficiency and prolongs the life of your Scales.

Concrete Mixers

"The Standard" Concrete Mixer, on account of its low charging feature, light weight and portability, is perhaps used more extensively around the mines for concrete work than any other mixer made. Capacities 2 to 40 cu. ft. of unmixed material per batch. Our Concrete Mixer Catalogue No. 37 forwarded on application.

Engines: Pumps

A complete line of Gas, Gasoline, Oil and Steam Engines for every purpose. Capacities 1 h. p. up, either vertical or horizontal. Also a complete line of pumps.

Scales

Twenty-five years' experience in manufacturing Scales, and our location in the center of the coal industry places us in position to furnish the Coal Operator with the right Scales for the requirements and at prices in line with the grade of Scales needed.

Send for our Scale Catalogue No. 14, containing illustrations and list of the several hundred sizes we manufacture. Full information gladly sent whenever requested.

Winslow Government Standard Scale Works, Inc.

Terre Haute Indiana, U. S. A.

Manufacturers of

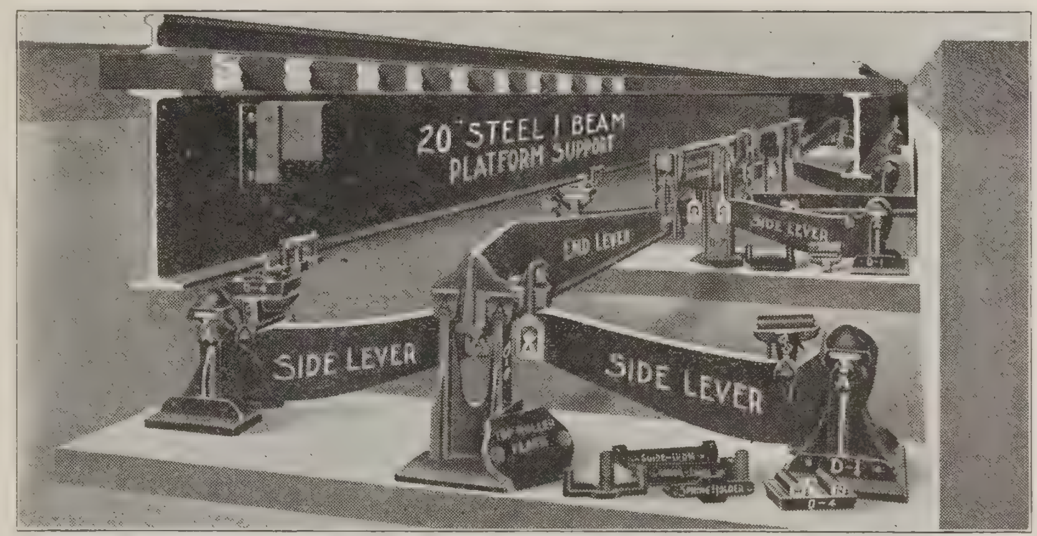
HEAVY CAPACITY SCALES

Products

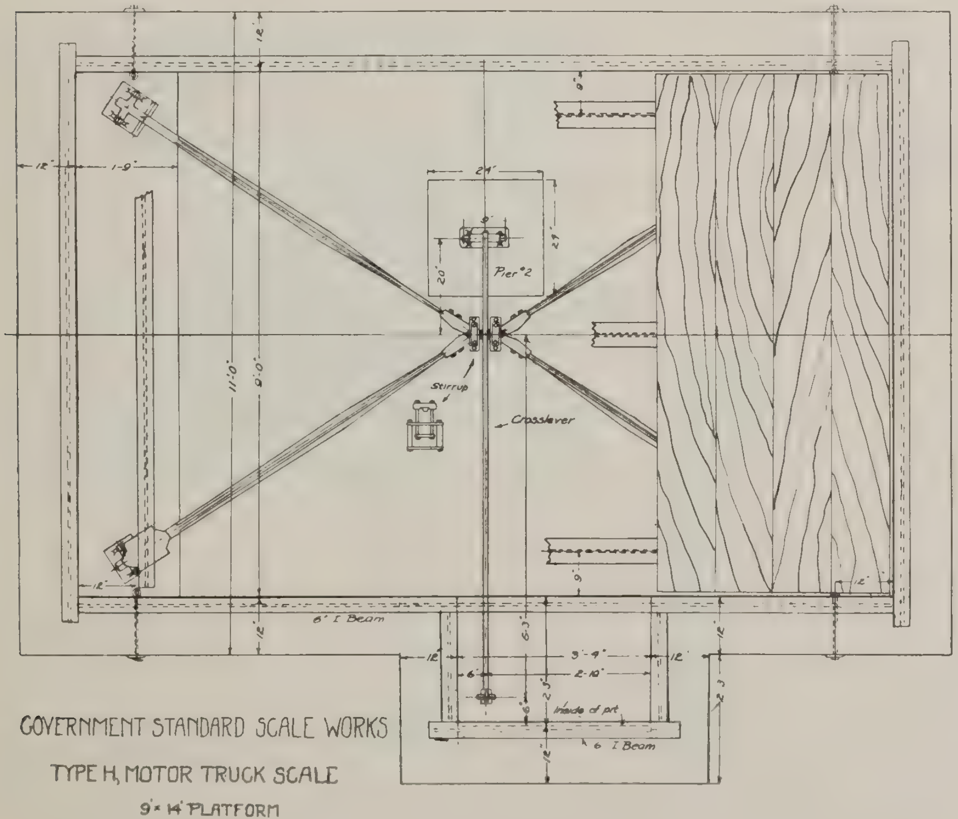
We manufacture all sizes of heavy Scales, from one ton to 325 tons capacity.

NOTHING SUCCEEDS LIKE SUCCESS.

No amount of shock can produce any slipping or scraping of the knife edge bearing on the surfaces with which they come into contact. An exclusive patented feature of WINSLOW GOVERNMENT STANDARD SCALES.



THIS IS, FOR THE PRESENT DAY AND AGE, THE BEST RAILROAD TRACK SCALE THAT BRAINS AND MONEY CAN PRODUCE.



The above cut shows our "H Type" Straight Lever Wagon and Motor Truck Scale.

"H Type" Straight Lever Scales

are made in many sizes of platform and of different capacities to accommodate the various requirements of the trade, from one to thirty tons.

You will notice that no main levers are held in suspension.

All main levers are straight and of the same multiple.

One main lever is not supported by another. Each main lever is made amply strong to support the entire rated capacity of the scale.

All main levers are supported on stationary stands, which are provided with self adjustable bearing blocks to receive knife edges, in such a manner as to insure full length of knife edge contact and equal distribution of load along the entire length of each knife edge, this eliminates the use of loops which permit friction.

GENERAL ELECTRIC COMPANY

General Offices:
Schenectady, N. Y.

The Guarantee of Excellence
on Goods Electrical

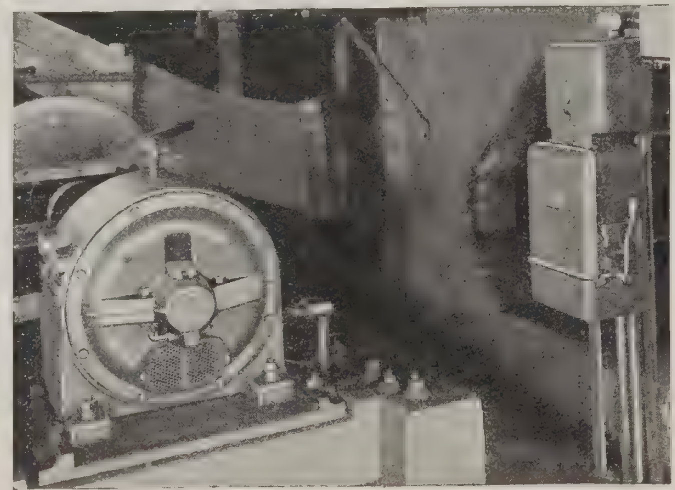
Sales Offices
In All Large Cities

Electrical Equipment for Mines---Motors

Mine conditions are more severe than those met in any other branch of motor application. For this reason the General Electric Company, in collaboration with leading mine electrical engineers, has developed a complete line of alternationg current motors which can be supplied for every mine requirement.

Their high starting effort and large capacity for severe overloads will often start and keep breaker machinery going when conveyors and screens are overloaded and crushers would jam were less power available. What is true in the breaker is typical of all severe mine service where these motors are extensively used.

The enclosed, self-ventilated, frame construction of these motors permits cooling the motor by clean air from outside the building. This air can be drawn in by the fan, which is enclosed in motor frame, through one pipe and discharged into another or into the building through a screened opening.



Mine Type Induction Motor, Driving Breaker Machinery, D. L. and W. Coal Co.

The unusually strong mechanical construction of these motors and their extra heavy shafts assure resistance to the many unexpected shocks encountered in mine work. An extra long bearing surface on shaft for rotor spider and a strong one piece back gear bracket are other features which give strength and solidarity. When back gear bracket is ordered it is firmly fastened to motor frame by four widely spaced bolts.

These motors can be opened for inspection without disturbing back shaft or gearing where the latter are used.

HI motors are supplied in the following standard capacities:

MINE TYPE INDUCTION MOTORS.

Type H I Form K
5 to 75 HP. 60 Cycles—3 Phase.
220, 440, 550 Volts.

H. P.	Speed Synchronous	Approx. Shipping Wt. Motor and Comp.	Approx. Shipping Wt. with Back Gear and Comp.	Full Load Speed.
5	600	1100	1750	560
7½	900	1040	1700	845
10	900	1100	1750	845
10	600	1820	3100	555
15	900	1630	2730	850
15	600	2000	3270	560
20	900	1820	3100	845
20	600	2700	4560	555
25	900	2000	3270	860
25	600	2700	4560	560
35	900	2850	4700	865
35	600	3240	5360	565
50	900	3280	5400	855
50	600	3560	5700	570
75	900	3610	5750	860

Note—Above ratings can also be furnished as Form M—for variable speed.—10 HP. 600 r. p. m. and above.

WESTINGHOUSE ELECTRIC & M'F'G CO.

EAST PITTSBURGH, PA.

SALES OFFICES

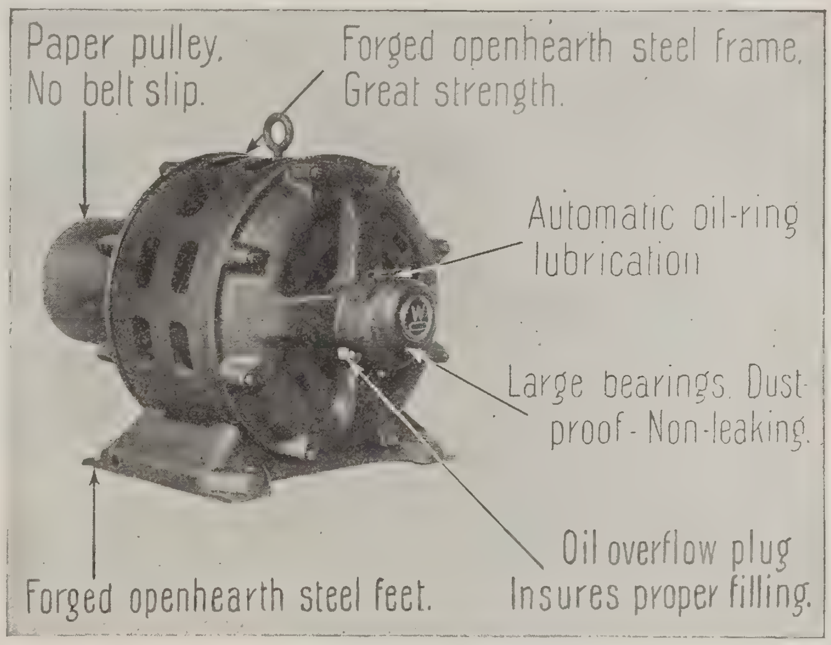
Atlanta, Ga.
Baltimore, Md.
Birmingham, Ala.
Bluefield, W. Va.
Boston, Mass.
Buffalo, N. Y.
*W. E. & M. Co., of Texas.
Butte, Mont.
Charleston, W. Va.
Charlotte, N. C.
Chicago, Ill.
Cincinnati, Ohio.
Cleveland, Ohio.
Columbus, Ohio.
Dallas, Tex.
Dayton, Ohio.
Denver, Colo.
Detroit, Mich.
*El Paso, Tex.
*Houston, Tex.
Indianapolis, Ind.
Joplin, Mo.
Kansas City, Mo.
Louisville, Ky.
Los Angeles, Cal.
Memphis, Tenn.
Milwaukee, Wis.
Minneapolis, Minn.
New Orleans, La.
New York, N. Y.
Omaha, Neb.
Philadelphia, Pa.
Pittsburgh, Pa.
Portland, Ore.
Rochester, N. Y.
St. Louis, Mo.
Salt Lake City, Utah.
San Francisco, Cal.
Seattle, Wash.
Syracuse, N. Y.
Toledo, Ohio.
Washington, D. C.

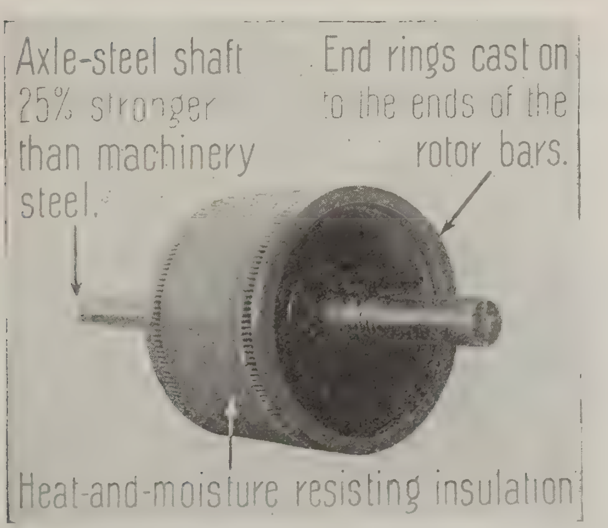
Products

Electrical Equipments for all mining apparatus.

Westinghouse CS is the best motor for driving:

- Tipple Machinery
- Conveyors
- Crushers
- Dumpers
- Fans
- Pumps
- Shaker Screens
- Tools
- Washers


Paper pulley. No belt slip.
Forged openhearth steel frame. Great strength.
Automatic oil-ring lubrication
Large bearings. Dust-proof - Non-leaking.
Oil overflow plug Insures proper filling.
Forged openhearth steel feet.


Axle-steel shaft 25% stronger than machinery steel.
End rings cast on to the ends of the rotor bars.
Heat-and-moisture resisting insulation

"The C S for Mine"
is always the answer of the Superintendent or Manager who has used one, because it has—

1. Indestructible Rotor
2. High Efficiency
3. Open slots for primary coils, permits quick repairs.
4. Form wound coils above 5 horsepower, permits quick repairs.
5. No wearing parts but the bearings and they last for years.

RATINGS—60 CYCLES—2 OR 3 PHASE

FOR 220 OR 440 VOLTS.

H. P.	APPROX. SPEEDS AT FULL LOAD				
2, 3	1730	1130	850		
5, 7½, 10, 15, 20	1750	1150	870	700	575
25, 35, 50, 75, 100	1750	1150	870	700	575
150, 200,	1750	1150	870	700	575

FOR 2200 VOLTS.

15	1755	1160	870		
20	1760	1165	870		
25, 35, 50,	1760	1170	875	700	
75, 100, 150, 200	1765	1175	875	700	585

Ask any user and let him tell you.

Manierre Engineering & Machinery Co.

Manufacturers of

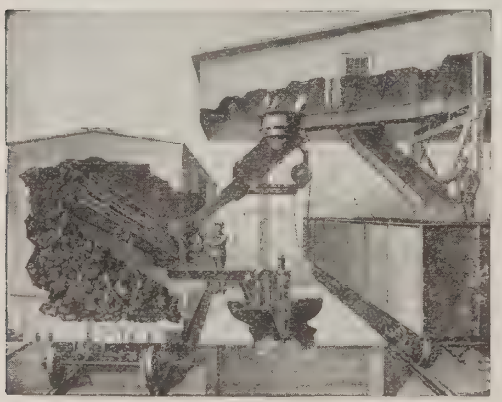
BOX CAR LOADERS.

Milwaukee, Wisconsin

Description of Standard Manierre Box Car Loaders

The long reach Manierre box car loader differs from other loaders in that it is a conveyor. The conveyor can be tilted so as to minimize the drop, and the new Manierre extension type loader extends 18′ 6″ maximum from the center line of the car door, thus reaching to the extreme end of any box car. Coal six inches or under is turned in the direction of the belt as it comes from the chute, to reduce breakage. The center of the car can be filled by this loader. Thus every detail of the Manierre is planned to reduce breakage. The construction of the loader is simple. It is easy to operate. It is moved by hand, and is supported on two hinged arms journalled on ball and roller bearings. The conveyor frame carries the motor which is connected by roller chain to conveyor drive shaft. It occupies little space, and can be installed under the most difficult conditions. Below are some specifications for coal loading and descriptions of standard Manierre arrangements.

Lump Coal Loaded Into a Box Car by a Manierre.



Showing Typical Installation at Mine.

Name	To Load	H. P.	Per Hour Cap. 30 Ton Cars	Belt Speed
24″ Rotary	Slack	7	3 to 4	
16″ Belt	6″ and under	5	3 to 4	375 to 875
24″ Belt	6″ and under	7½	4 to 6	350 to 700
24″ Steel Apron	Mine Run	20	6 to 8	350 to 700
Extension	Lump	20	6 to 8	175 to 350

STANDARD ARRANGEMENT.

1—Single acting loader on same side of car as chute with loader standing in off position at right angles or parallel to car with arms swung above operating platform or inverted. Operates in connection with our standard chute, having side to side motion and moved in and out by chain wheel.

2—Double acting loader loading on either side between tracks spaced preferably 19′ centers. Chute same as the single acting except that it can be turned 180 degrees from one track to the other. Double arrangement saves time of spotting cars also makes it possible to fill center of loaded car with chute while loader is being placed in other.

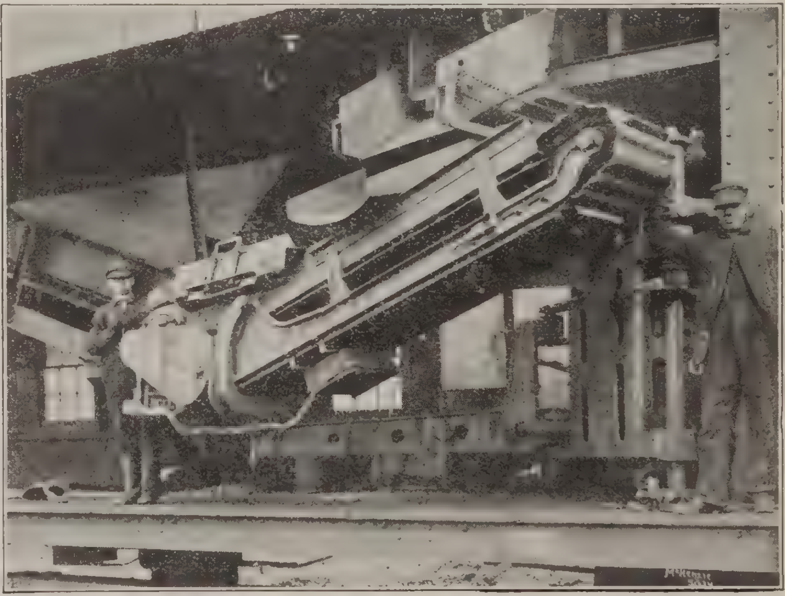
3—Loader installed with long arms so as to take coal from chute coming in on either or both sides of car.

4—Single acting loader with chute arrangement to load open cars on one track while changing box cars on a second track; thus saving time lost in spotting cars.

5—Portable loader hand traversed or equipped with traction motor to pull 6 loaded 30 ton cars. If chute is on loader side, chute can be carried on car with hopper and screens to load in connection with steam crab or under line of pockets.

6—We design loaders to meet special needs.

"SIX FIRMS USE THIRTY-ONE MANIERRES."



Steel Apron Loader for Large Lump Coal.

OTTUMWA BOX CAR LOADER CO.

OTTUMWA, IOWA

Manufacturers of

Box Car Loaders, Steel Tipples, Shaker Screens, Cages, Rotary Dumps,
Grease Systems, Haulage Systems Mine Equipment

Loader Models

Stationary Loaders—Semi-Portable, for loading from limited number of bins. **Crawfish Portable,** for moving across tracks to give clearance. **Portable,** for loading at any point and for switching cars. **Rocking Cradle,** for tilling cars and loading by gravity at large capacity mines. **Scraper Line,** for small-sized coals. **Paddle Wheel,** for slack, sand, gravel, crushed rock, etc. **Special Loaders** to meet all loading conditions. All loaders both **steam** and **electrically** driven.

Picking-up Loader only loader on market which will pick up off ground and load large chunk coal as well as small sizes.

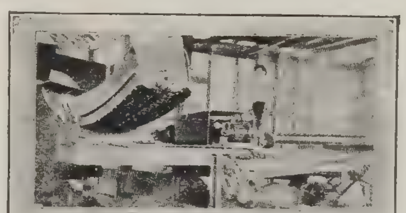
Construction

Heavy structural steel—extra double strength iron and steel castings—tool and high carbon steel chains—brass and bronze bushings—ball and roller bearings—insure durability and long life, ease of operation and economy of power.

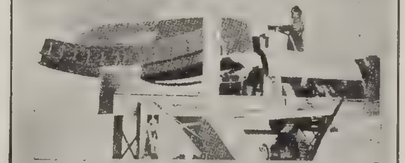
Uses and Advantages

Saves labor of from 4 to 8 men. Only one man to operate. The **Ottumwa** does the entire loading. The **Ottumwa carries the coal,** no throwing motion, therefore no breakage—26 feet of hopper extension carries coal to end of car—maximum capacity, minimum expense—increased tonnage, decreased delays—box cars always available—allows mine to operate when open cars scarce—has car-pulling attachment, alone worth price of loader—loads cars to capacity—box car coal brings higher price—shipping coal in box cars prevents claims for shortage—**more Ottumwas in use than all other makes combined.**

SEND FOR CATALOG. DO NOT DELAY.



STANDARD STEAM BOX CAR LOADER
[illegible] COAL COMPANY, [illegible]

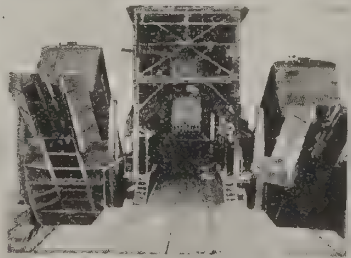


STANDARD ELECTRIC BOX CAR LOADER,
[illegible] COAL COMPANY OGLESBY ILL.

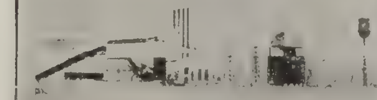
CRAW FISH ELECTRIC BOX CAR LOADER,
CARTER COAL COMPANY COALWOOD, W. VA.

PORTABLE ELECTRIC BOX CAR LOADER,
MILWAUKEE WESTERN FUEL COMPANY, MILWAUKEE WIS.

PORTABLE STEAM BOX CAR LOADER
NORTHWESTERN FUEL COMPANY SUPERIOR, WIS.



2 GRAVITY ROCKING CRADLE BOX CAR LOADERS
CROWS NEST PASS COAL COMPANY FERNIE B. C. CAN.



CONVERTED TIPPLE [illegible]
ACME COAL COMPANY ACME, WYOMING

THE JEFFREY MANUFACTURING COMPANY

Main Office and Works: 962 North Fourth St., Columbus, Ohio

SALES OFFICES:

New York.............50 Dey Street	Chicago...........McCormick Bldg.
Boston..............141 Milk Street	St. Louis...Railway Exchange Bldg.
Philadelphia..Real Estate Trust Bldg.	Milwaukee.............M. & M. Bldg.
Pittsburgh......Farmers Bank Bldg.	Denver....First National Bank Bldg.
Scranton, Pa..Union Nat. Bank Bldg.	Seattle...........L. C. Smith Bldg.
Broadwell, O.......H. H. Townsend	Birmingham......Brown-Marx Bldg.
Middlesboro, Ky..Middlesboro Hotel	Dallas..........................Commonwealth Nat. Bank Bldg.
Charleston...........West Virginia	

Canadian Works...........Montreal

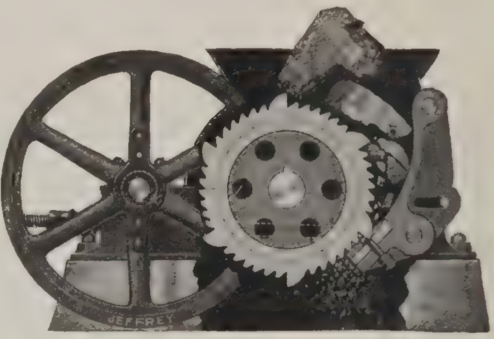
Single Roll Coal Crusher For Sizing Coal For Stoker Use

One operation reduces large lumps and run-of-mine coal to 1¼ and under, the proved size for stoker use.

Receives coal in any volume direct from a track hopper, grab bucket or mine car without the use of a Feeder.

Easily Adjusted. In five minutes, without shutting off the power, the sizes of product can be changed from 7 inches to 1¼ inches.

Can be started up under full load—cannot be flooded or choked down. Equipped with an efficient Safety Device which protects against shocks and accidents.



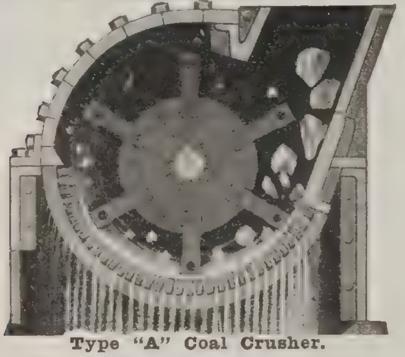
Consumes but little power—costs little to install.

Table of Capacities			Using Hard Bituminous Coal Such as Indiana Block							Using Medium Bituminous Coal Such as Ohio or Illinois Run-of-Mine							Using Soft Bituminous Coal Such as Pocahontas						
			*Size of Product—Tons per Hr.							*Size of Product—Tons per Hr.							*Size of Product—Tons per Hr.						
Size Crusher Inches	Drum R. P. M.	Appr'x H. P. †	1"	1¼"	1½"	2"	2½"	3"	4"	1"	1¼"	1½"	2"	2½"	3"	4"	1"	1¼"	1½"	2"	2½"	3"	4"
18 x 18	75	15	20	25	30	40	....	....	....	30	35	40	45	....	....	....	50	50	50	50	....	....	....
24 x 24	60	30	30	35	45	60	75	90	....	50	60	70	80	90	100	....	100	110	115	120	120	120	....
30 x 30	50	40	50	50	60	80	100	120	160	75	85	100	125	150	170	180	160	170	180	190	200	200	200
36 x 36	40	60	75	80	100	110	130	150	175	100	115	125	150	175	200	200	175	200	225	250	250	250	250

*By "Size of Product" is meants average results, 80 to 90 per cent. pass screen indicated.
†Horse power will vary according to exact nature of coal as to hardness, toughness, friability and moisture.

Size Inches	Shipping Weight, Pounds	Largest Lump for Feed, inches	Max. Speed (R. P. M.)		Size Pulley Inches	
			Roll	Pulley	Dia.	Face
18x18	3200	8	125	500	34	6½
24x24	6500	14	100	400	42	8½
30x30	10500	20	75	300	48	10½
36x36	20000	20	60	240	60	12½

200 Jeffrey Single Roll Crushers are now in use and doing everything we claim for them. **Write for Bulletin No. 141-62,** containing Illustrations, Detail Drawings, Descriptions and Testimonials.



Type "A" Coal Crusher.

Swing Hammer Crushers for Reducing Coal for Coking Purposes

Combine distinctive features in design and construction that insure uniform fineness, the most essential requirement in making good coke.

Type A Crusher

is also particularly adapted for the reduction of refuse or Culm, for flushing back into the mines by water.

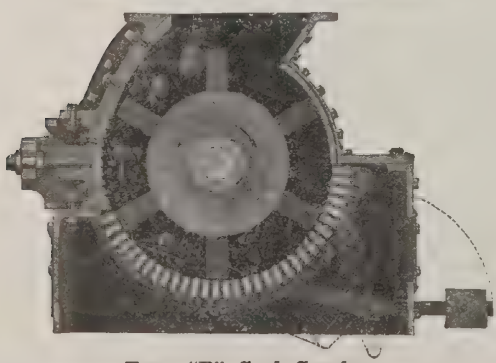
Wide openings between the screen bars of **Type B** Crushers prevent clogging the machine when pulverizing wet coal, cause minimum wear on hammers and allow small pieces of iron to pass through without dropping bottom or stopping the machine. **.Write for Bulletin No. 147-62.**

Type "A" Coal Crusher

No.	Dia.	Wid.	Approx. H P.	Approx. Weight Lbs.	Speed.	Approx. Capacity p.r Hour.
B 2	30"	24"	35	4300	1100 to 1200	20 to 25 tons Run Mine Coal ¼" to Dust
B 3	36"	30"	70	7300	1000 to 1100	50 to 60 tons " " " " "
B 6	42"	24"	70	8000	900 to 1000	50 to 60 tons " " " " "
B 4	42"	36"	80	9000	900 to 1000	70 to 75 tons " " " " "
B 5	42"	48"	110	16000	800 to 900	90 to 100 tons " " " " "

Type "B" Coal Crusher

Code	*No.*	*Dia.*	*Wid.*	*Pulley*	*Approx. H. P.*	*Aprx Wt. Lbs.*	*Speed*	*Floor Space*	*Feed Opening*	*Approx. Cap'y Run Mine Coal ¼" to Dust pr hr*
Cruknife........	H 2	24"	20"	12"x10"	15 to 18	4000	1200 to 1400	5' 9"x3' 4¾"	15"x20"	8 to 10 tons
Crudish........	H 3	36"	24"	22"x15"	50 to 60	9600	900 to 1100	7' 9¾"x4' 8½"	22"x24"	50 to 60 tons
Cruspoon........	H 6	36"	42"	24"x24"	90 to 100	11000	800 to 1000	10' x4' 8½"	22"x42"	90 to 100 tons
Cruladle........	H 7	36"	48"	24"x24"	140 to 150	15000	800 to 1000	10' 7"x4' 8½"	22"x48"	150 tons
Crublade........	H 8	42"	60"	26"x28"	225 to 250	30000	700 to 900	15' 4"x5' 8"	20"x60"	250 tons



Type "B" Coal Crusher.

PENNSYLVANIA CRUSHER CO.

Stephen Girard Building, PHILADELPHIA, PA.

NEW YORK
Hudson Terminal Bldg.

PITTSBURGH
Peoples Bank Bldg.

Products

Coal crushing and cleaning machinery for By-Product and Bee-Hive coke plants, Swing Hammer Crushers, Bradford Coal Cleaners, Rotary and Jaw crushers, Single Roll crushers, Grinding Pans, Delamater "sink and float" Testers.

"Pennsylvania" Swing-Hammer Crushers

Extensively used for pulverizing bituminous coals in By-Product and Bee-Hive coking plants, for crushing Cement Rocks and Limestones in Cement Mills, for Lime, Shales, Bone and a multitude of other materials.

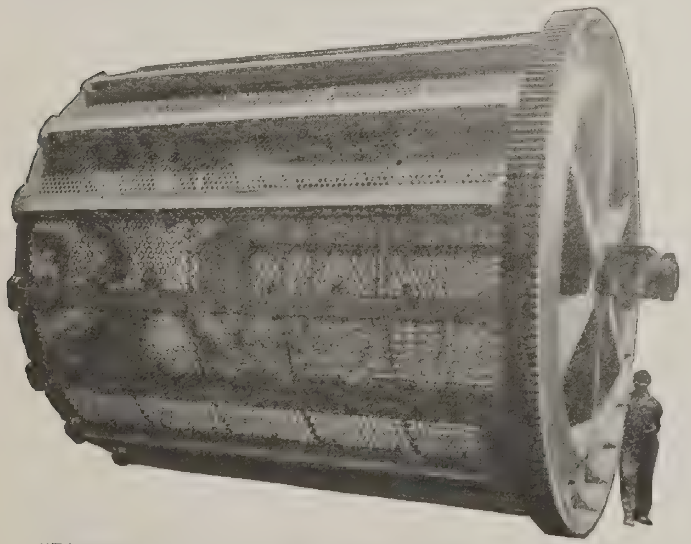
Main frame of fabricated Steel practically immune from breakage. Removable Steel Wear-Liners, Ball & Socket Bearings, 6,8 and 10 rows of hammers, large diameter Steel discs, quick adjustable Grinding Cage. Built in capacities 3 tons to 500 tons hourly. By weight the "Pennsylvania" is more than 90% Steel. Also builders of the only **One-piece** Cast Iron Frame on the market.

"Pennsylvania" Bradford Coal Cleaners. (For Coke Ovens, Coal Washeries and Power Plants.)

In addition to its distinct advantage as a Crusher, this machine has the **remarkable ability to automatically remove impurities** such as slate, bone, sulphur balls or binder from bituminous steam and coking coals, thereby reducing the objectionable ash and sulphur.

It is used extensively in preparing R. O. M. coals in By-Product and Be-Hive Ovens, Coal Washeries, etc.

In addition to its crushing and cleaning functions for R. O. M. coal for **large Power Houses,** the "Pennsylvania" Bradford is most efficient in removing stray iron, coupling pins, mine props and all sorts of impedimenta that damage conveyors, stokers and other power house machinery.

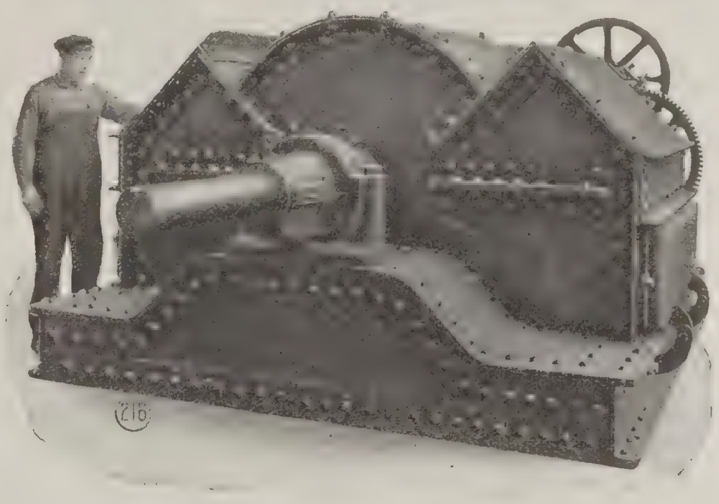


"PENNSYLVANIA" BRADFORD COAL CLEANER.
(Patented.)

For Coal Washeries and Stoker-feed it crushes R. O. M. with less fines than rolls or any other type.

Absolutely automatic in operation, low horsepower, runs 12 to 15 r. p. m., requires no labor to operate, other than occasional oiling. Is practically "foolproof." Built in capacities 10 to 300 tons hourly.

These "Pennsylvania" Bradfords are successfully operating in connection with Coal Washers.



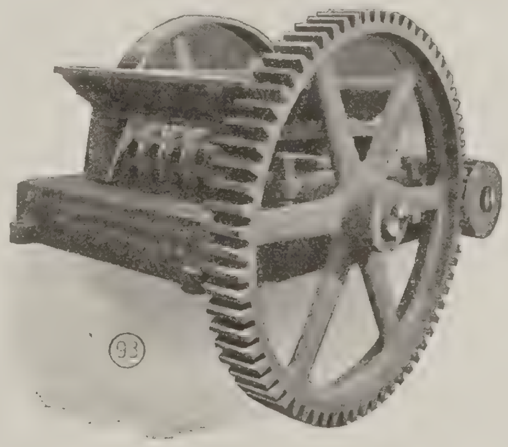
"PENNSYLVANIA" HAMMER CRUSHER.
(Patented.)

"Pennsylvania" Single Roll Crushers

For coarse and moderately fine crushing of coal, coke, lime, limestone, fireclays, shales, phosphate rock, chemicals, etc. **Excellent for stoker-feed crushing.**

Features:

1—Big reduction of large lumps in ONE operation.
2—Fed from bin, car, grab-bucket or steam shovel—no mechanical feeder.
3—Not choked by overfeed—different from 2-roll crusher.
4—Roll won't spread, no matter how heavily fed.



ROLL CRUSHER.

5—Can be started with hopper full.
6—Automatic safety device.
7—Readily adjustable for varying sizes of crushing.
8—Wear parts quickly accessible.
9—Slow speed—35 to 40 R. P. M.
10—Easy on horse power.
11—Several sizes, ruggedly built, simple design.
12—Very economical of headroom.
13—Low upkeep and installation.
14—No changing pitch diameters.

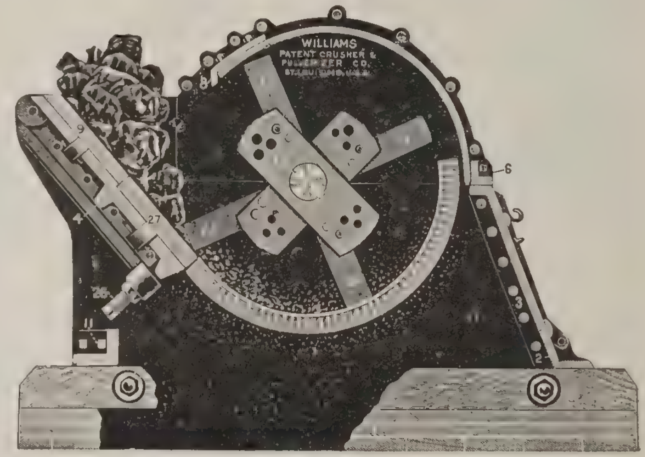
THE WILLIAMS PATENT CRUSHER AND PULVERIZER CO.

OLD COLONY BUILDING, CHICAGO
WORKS: ST. LOUIS
OFFICES: NEW YORK, SAN FRANCISCO, PHILADELPHIA, PITTSBURGH

COAL CRUSHERS FOR COKE OVEN WORK

Results—By the use of the Williams Patent Hammer Crushers with the various adjustable features, the following results are obtained from the ovens: The oven pulls easier, as the structure of the coke is more uniform—more coke is made from each oven, there being no waste, no black hearts and uncoked ends—the ash is reduced and added to the amount of coke produced—the coke comes out firm, regular in size, does not crumble, as it contains no cross fractures, and the structure is much improved. In a great many plants where these crushers have been used, the grade of coke has been raised from second and third to first quality. There is no question but that the application of a machine of this type to your plant will greatly improve the quality of your coke.

Bee Hive Oven—Where crushing coal for the ordinary bee hive oven, these regular machines should be used up to capacities of 200 tons per hour when crushing to ½″ or ⅜″, or up to 150 tons per hour when crushing to ¼″ and finer, and up to 120 tons per hour when crushing to ⅛″ and finer.



By-Product Oven—When working in connection with the improved By-Product ovens, this Regular type of Crusher should be used where capacities run from 10 tons per hour upwards to 120 tons as the general specifications on crushed coal for by-product ovens is in some cases 80 to 85% ⅛″ and finer, and in extreme cases 90% ⅛″ and finer.

REGULAR SPECIFICATIONS

Size Mill	Hopper Opening	Size Feed	Capacity Tons Per Hour			Speed	Size Pulley		Extreme Dimensions			Horse Power	Weight
	Inches		½″ & finer	¼″ & finer	⅛″ & finer	R.P.M.	Diam.	Face	Length	Width	Height		Pounds
1	15 x 12	Run of Mine	30- 40	25- 30	20- 25	1000	20″	15″	6′	6′ 6″	3′ 9″	20-25	6500
2	20 x 12		45- 55	40- 50	30- 40	1000	20″	15″	6′	7′ 6″	3′ 9″	30-35	7500
3	30 x 16		65- 80	60- 70	45- 60	1000	20″	15″	6′	8′ 6″	3′ 9″	50-60	9500
4	40 x 18		100-115	80- 90	60- 80	1000	24″	18″	6′	9′ 0″	3′ 9″	75-80	10500
5	50 x 20		120-140	100-110	75-100	1000	24″	20″	6′	9′ 6″	3′ 9″	100	12000
6	60 x 20		150-175	115-130	100-120	1000	24″	22″	6′	11′ 0″	3′ 9″	125	13500

We furnish a Williams Flexible Coupling in place of Pulley Without Extra Cost.

JUMBO CRUSHERS

General Construction—To give the reader some idea of the general construction of this type of machine, we would call attention to the fact that all of the Jumbos are 48″ in diameter and of different widths, the No. 5 being 30″ wide, the No. 6, 36″; the No. 7 is 48″ wide, and the No. 8 is 60″ wide. The hopper openings are very large and will accommodate the largest run of mine coal. The extreme height of this machine is 62½″, the weights vary from 20,000 to 30,000 lbs., depending on the size.

JUMBO SPECIFICATIONS

Size Mill	Hopper Opening	Size Feed	Capacity Tons Per Hour			Speed	Size Pulley		Horse Power	Extreme Dimensions			Weight
	Inches		½″ & finer	¼″ & finer	⅛″ & finer	R.P.M.	Diam.	Face		Length	Width	Height	Pounds
5	30 x 24	R. O. M.	150-175	120-140	80-100	750	24″	18″	85-100	8′ 10″	9′	5′ 4″	20000
6	36 x 24		180-200	145-165	120-140	750	30″	20″	140-150	8′ 10″	10′	5′ 4″	24000
7	48 x 30		225-250	200-220	150-175	750	30″	24″	165-185	8′ 10″	11′	5′ 4″	28000
8	60 x 30		275-300	250-275	180-200	750	30″	24″	200-250	8′ 10″	13′	5′ 4″	30000

CAMEL BACK CRUSHERS

These Camel Back machines are especially advocated for capacities at ½″ and ⅜″ crushing ranging from 200 to 400 tons per hour, at ¼″ crushing from 150 to 250 tons per hour, and on ⅛″ crushing from 125 to 200 tons per hour. An operator may have four or six rows of hammers, as desired; where run of mine coal is used, four rows are advocated by us and where slack, crushed, sized, or Bradford Breaker coal is used, six rows of hammers are advocated.

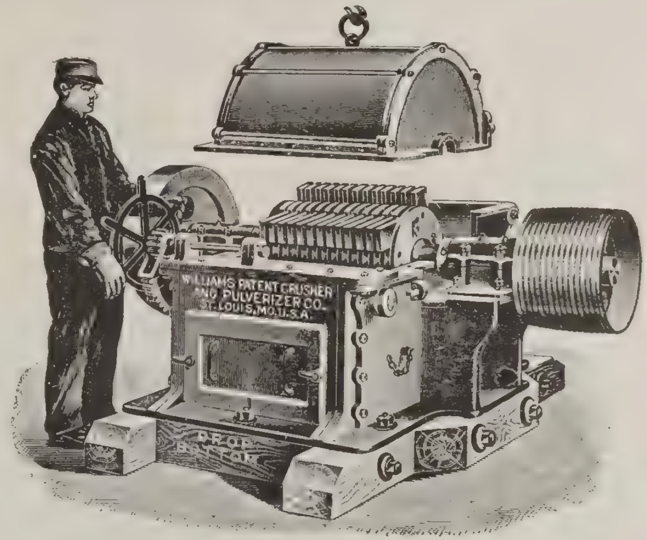
CAMEL BACK SPECIFICATIONS

Size Mill	Hopper Opening	Size Feed	Capacity Tons Per Hour			Speed	Size Pulley		Extreme Dimensions			Horse Power	Weight
	Inches		½″ & finer	¼″ & finer	⅛″ & finer	R.P.M.	Diam.	Face	Length	Width	Height		Pounds
5	24 x 15	R. O. M.	120-140	100-115	75- 85	1000	24″	16″	7′ 6″	9′ 6″	4′ 5″	80- 90	15000
6	36 x 15		175-200	150-165	110-130	1000	24″	18″	7′ 6″	10′ 6″	4′ 5″	100-125	20000
7	48 x 15		225-260	200-225	135-175	1000	24″	20″	7′ 6″	11′ 6″	4′ 5″	140-160	24000
8	60 x 15		300-325	250-280	175-215	1000	24″	22″	7′ 6″	12′ 8″	4′ 5″	175-200	28000

CRUSHERS FOR SIZING COAL FOR STOKERS

The Williams Patent Coal Splitter takes Run of Mine Coal and reduces the same to 1½″, 1¼″, 1″, ¾″ and finer with the "minimum amount of fine dust," the only machine made that can be regulated to properly size coal. All parts are adjustable to wear; the crusher is also adjustable to give most any size coal desired.

All large industrial plants are no doubt troubled, from time to time, with a shortage of screenings. This is caused by many mine conditions, chief among which we believe to be the decreasing demand for lump, or the larger sizes of coal. Where a mine has little demand for special size coal, naturally, they can make a very small percentage of screenings or slack. It must also be taken into consideration that a very large percentage of industrial plants are now equipped with chain Grates or Stokers, which demand Slack or Screenings, consequently the demand for lump or run of mine is reduced, and to what many think is a dangerous point, therefore, the only remedy for a scarcity of Slack or Screenings is the adoption of Crushers, either at the Mine or at the plants where the coal is used.


WILLIAMS PATENT CRUSHER AND PULVERIZER CO. ST. LOUIS, MO. U.S.A.

BRIEF SPECIFICATIONS

No. of Crusher	Hopper Opening Inches	Weight	Horse Power	Capacity—Tons Per Hour R.O.M. to 1½″ and Finer
1	15 x 12	6,500	15 to 20	25 to 40
2	20 x 12	7,200	20 to 25	50 to 60
3	30 x 16	9,500	40 to 50	75 to 100
4	40 x 18	10,500	60 to 75	100 to 125
5	50 x 20	12,000	85 to 100	135 to 175
6	60 x 20	13,500	100 to 125	180 to 220
7	48 x 36	22,000	135 to 175	250 to 275
8	60 x 36	30,000	200 to 250	300 to 375
9	60 x 40	40,000	275 to 350	400 to 500

CRUSHERS FOR MINE DEBRIS

In offering to the Anthracite trade our patent Hinged Hammer Debris Crushers for the reduction of Anthracite Debris or Culm, we do so, knowing that every Mine Manager, Superintendent, and Foreman, appreciates the value of crushing their refuse, and flushing it back into the Mines by water.

This is not a new idea; some mines have used this system for years, hence we believe that you are more or less familiar with this proposition, but on the subject of properly crushing and treating this material before flushing it into the mines, we think that we can be of some service to you, and will briefly call your attention to the crushers we have to offer for this work.

SPECIFICATIONS

Size Mill	Hopper Opening	Size Feed	Capacity Tons Per Hour			Speed	Size Pulley		Extreme Dimensions			Horse Power	Weight
	Inches		¾″	½″	¼″	R.P.M.	Diam.	Face	Length	Width	Height		Pounds
1	15 x 12	Run of Mine	30	20	15	1000	20″	15″	6′	6′ 6″	3′ 9″	20-25	6500
2	20 x 12		40	35	25	1000	20″	15″	6′	7′ 6″	3′ 9″	25-30	7500
3	30 x 16		65	50	35	1000	20″	15″	6′	8′ 6″	3′ 9″	40-50	9500
4	40 x 18		80	70	60	1000	24″	18″	6′	9′ 0″	3′ 9″	75-80	10500
5	50 x 20		115	85-100	75	1000	24″	20″	6′	9′ 6″	3′ 9″	100	12000
6	60 x 20		130	110-125	90-100	1000	24″	22″	6′	11′ 0″	3′ 9″	125	13500

Special Note—All Williams Crushers mentioned herewith are equipped with Adjustable hammers, adjustable disc plates, adjustable cages, adjustable Breaker Plates, extra heavy housing construction, lined with liners to protect housing from wear, heavy shafts, substantial dynamo journals, which mean the maximum capacity, minimum horse power, and minimum cost for maintenance or upkeep. No other similar crusher made has these features.

WRITE FOR COMPLETE COAL CATALOG NO. 50

MALCOLMSON BRIQUET ENG. CO.

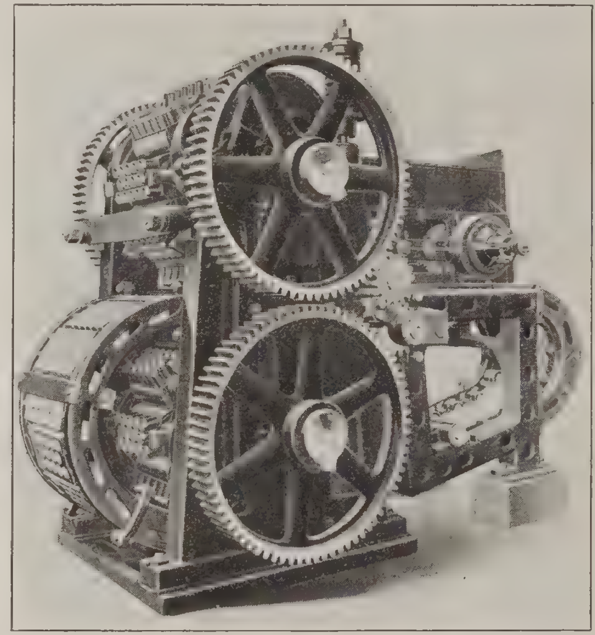
OLD COLONY BLDG, CHICAGO, Ill.

CONSULTING AND CONTRACTING ENGINEERS

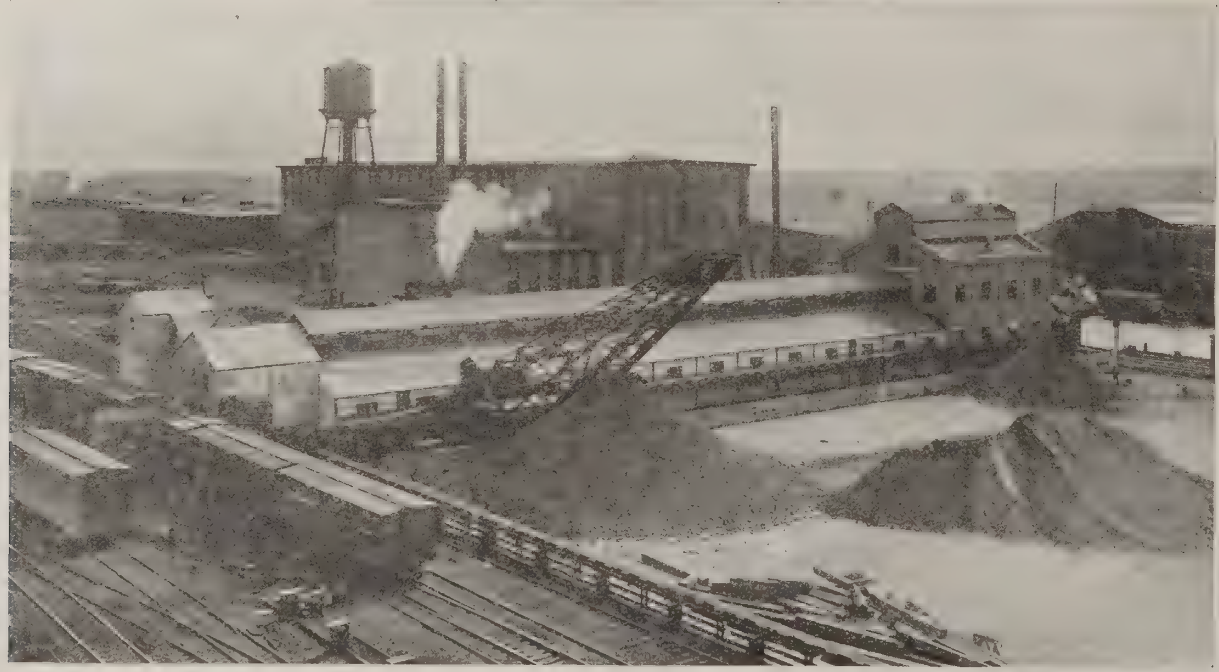
Complete Coal Briquetting Plants

The Rutledge briquetting press represents the latest improvement in briquetting machinery. It was developed to meet the requirements of American conditions, by producing a large output of small briquets, made under high pressure with a small percentage of binder.

The Rutledge press is of the continuous mold type. It consists essentially of a chain of molds or die plates, passing under a feeding hopper and between two revolving drums, upon which punch rams are carried. Two pilot punches on each punch ram engage the die plates in advance of the entrance of the punches into the dies; these pilot punches not only serve to move the dies forward, but insure perfect alignment of the dies and punches. The lower punches enter the dies again at the lowest point of their travel, and eject the briquets.



Rutledge Briquetting Press.



Berwind Fuel Company's Plant, Superior, Wisconsin.

The Rutledge press and other specialized machinery; the selection of the best coal handling equipment; and the carefully worked out design make this plant the largest and most complete in the country. It represents, also, the latest development in a process for the conversion of screenings into high-priced domestic fuel, for which there is an immediate, ever-increasing and profitable market. Investigate the possibilities of coal briquetting in your territory. Write us for catalog. Your correspondence is solicited.

MASHEK ENGINEERING COMPANY

90 WEST STREET, NEW YORK, N. Y

Manufacturers of

BRIQUETTING MACHINERY AND PLANTS

Sizes and Capacities of Plants

We manufacture three sizes of standardized briquetting plant equipment, as follows:

Type "Y-1," 4½ tons of 2 oz. to 6½ tons of 4 oz. briquets per hour.

Type "M-2," 9 tons of 2 oz. to 15 tons of 5 oz. briquets per hour.

Type "C-3," 18 tons of 2 oz. to 30 tons of 5½ oz. briquets per hour.

These capacities are based on coal of about the same specific gravity as Pennsylvania Anthracite.

Coals

We build machinery and design plants to briquet any fuel. Our plants are briquetting Charcoal, Bituminous Coal, Coke Brieze, Anthracite Coal and Lignite, using the most suitable binders to meet the conditions the fuel is used for.

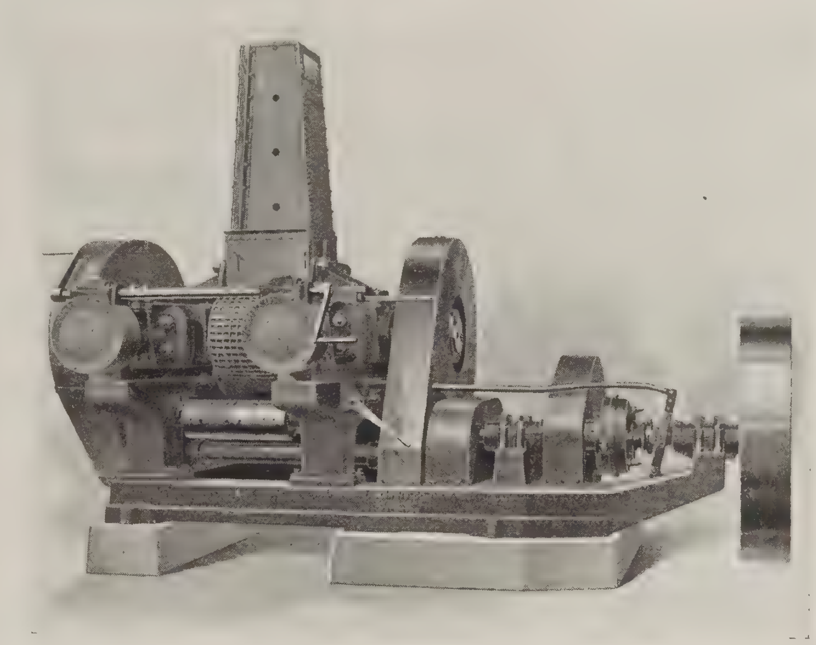
Binders

Our machinery will produce briquets using any binder. We have equipped plants to use Coal Tar Pitch and Asphalt residium obtained from distillation of oils, using this material in hot melted liquid state or pulverized. We have equipped all the commercial plants in the United States using patented or secret smokeless binders, producing a smokeless product that is waterproof and retains its hardness until consumed.

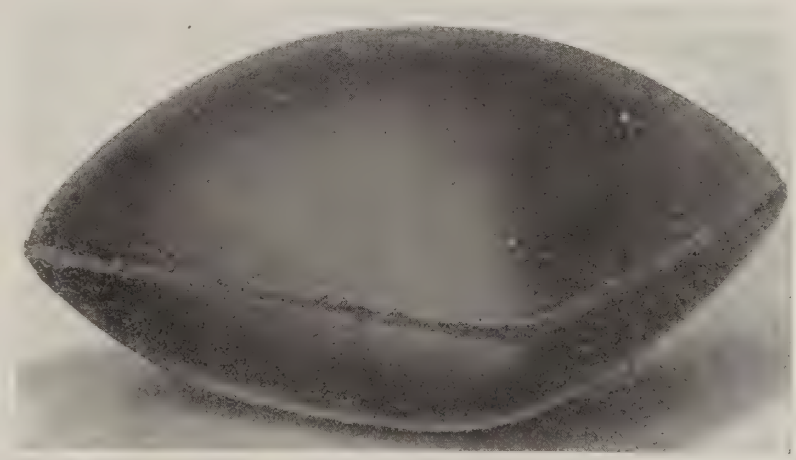
Size and Shape of Briquet

The over-stuffed pillow-shape briquet was developed by us, and we guarantee that briquets from any coal, made on our equipment, will have less breakage in handling and transportation than the lump or prepared coal, in fact, all briquets will be as hard as ordinary Pennsylvania Anthracite. The shape and right size of briquet for the purpose they are used for is important. Our shape briquets will spout, shovel and handle the same as ordinary coal; hardness will not be affected by heat of Sun or in coal bunkers. The Roll Shells are made of material that will outwear steel, accurately divided and ground to produce briquets 1⅝, 2, 2¼, 3, 4, and 5 oz. in weight. Presses are built so that change can be made from one size to another quickly. This shape briquet gives the best results during combustion, no matter of what coal they are made.

We are the oldest firm in the United States making a specialty of building briquetting machinery, and have equipped two-thirds of the plants in the United States and Canada. All of our plants are commercially successful, and none have turned out to be failures. Our machinery and processes are broadly covered by patents issued and pending. Plants are entirely automatic, machinery built heavy, mostly of steel with cut gearing, built to produce product from any coal to meet any requirement.



Type C-3 Briquet Press. Capacity 18 to 30 Tons Per Hour. Weight 42,000 Lbs.

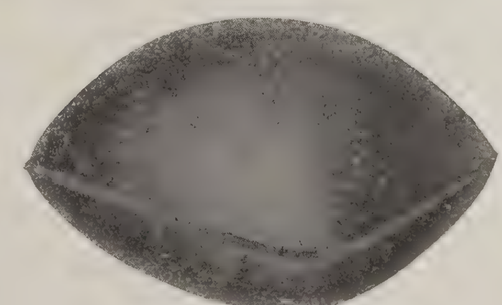


5 Oz. Briquet—Exact Size.

We build a complete line of special equipment from one end to the other, from our own designs and patterns, developed by long experience and observation both in this country and in Europe, such as elevators, feeders, steam and coal fired dryers, coal and binder pulverizers, mixers, presses and cooling tables, also ovens of different types to produce a smokeless product. We build equipment to convert Lignite into a fixed fuel, practically smokeless, equal in heating value to Pennsylvania Anthracite, which improves with age. We erect plants complete and turn them over to customers in operation, and guarantee capacity, cost of manufacture and quality of product.

Our catalog No. 4 covers the subject of briquetting any fuel, in detail, shows illustrations, drawings and photographs, costs of plants and manufacture, which we would be pleased to send, free, to those who may desire to convert their breakage and dust into fuel that will command an equal price to the best quality of lump or prepared sizes of coal. To others, the price of this catalog is one dollar.

We invite correspondence from those interested in this subject. If quality of product, efficiency and life of plant is considered, we have no competition.



1⅝ Oz. Briquet—Exact Size.

KEYSTONE
THE MINING CATALOG
COMBINED WITH
COAL FIELD DIRECTORY
CONSOLIDATED PUBLISHING
COMPANY Inc.

BUILDING MATERIALS AND MINE TIMBERING SECTION

Engineering Data

Tables—Safe Loads Steel Beams.
Mine Timbering and Building Materials Section.
Safe Load for Steel Beams.
Safe Load Beams and Posts of various Woods.
Lumber Table.
Board Measure.
Tables—Safe Loads Steel Beams and Posts of Different Woods.
Specific Gravity and Weights of Woods.
Tensile Strength of all materials.
Brick Work.
Stone Work.
Concrete in Mine Construction.

The following manufacturers and dealers have catalogue descriptions in this section:

Asbestos Protected Metal Co.
Barrett Company, The.
Cabot, Samuel, Inc.
C-A-Wood Preserver Co.
Cheesman & Elliott.
Detroit Graphite Co.
General Roofing Mfg. Co.
Johns-Manville, H. W., Co.
Keasbey & Mattison Co.
Lehigh Portland Cement Co.
National Roofing Co.
North American Construction Co.
Northeastern Co., The.

For additional descriptions of Mine Timbering and Building Materials not appearing in this section, refer to Index of Products in front of book.

STEEL BEAMS AND STRUTS

EXPLANATORY NOTES

Tables of safe loads for H and I sections as beams:—The safe loads given in tables are based upon extreme fiber stresses of 16,000 pounds per square inch. Safe loads include the weight of the beam and are assumed to be uniformly distributed.

For beams without lateral supports, when the span exceeds 20 times the flange width, the tabulated safe loads should be reduced as shown in the following tables:

Length of Beam	Maximum Safe Load	Length of Beam	Maximum Safe Load
20 x flange width	full tabulated load	50 x flange width	$\frac{7}{10}$ of tabulated load
30 x “ “	$\frac{9}{10}$ of “ “	60 x “ “	$\frac{6}{10}$ “ “ “
40 x “ “	$\frac{8}{10}$ of “ “	70 x “ “	$\frac{5}{10}$ “ “ “

The safe loads given above the horizontal lines shown in tables are the extreme safe loads based upon the safe strength of the web and should not be exceeded for shorter spans to avoid crippling of the web due to shearing strains.

The Deflection Coefficients, derived from fiber stress 16,000 pounds and modulus of elasticity of 29,000,000 pounds per square inch, are given for the maximum uniformly distributed loads on various spans. The maximum deflection, in inches, of a beam in the center of its span is obtained by dividing the deflection coefficient by the depth of the beam in inches.

For loads concentrated in the center of a span, use one-half of the safe loads given in table; the deflection is four-fifths of the deflection produced by the maximum safe load uniformly distributed over the span.

Tables of Safe Loads for H-sections as Struts and for Double Channel Struts:—The safe loads given in tables are assumed to be centrally applied and have been determined in accordance with the requirements of the New York Building Law. The allowable compressive stress in pounds per square inch is as follows;—

$$P=15{,}200-58\frac{l}{r}. \quad \frac{l}{r}=\frac{\text{unsupported length of strut, in inches}}{\text{least radius of gyration, in inches}}$$

the allowable ratio of $\frac{l}{r}$ ranging between 55 and 120, equivalent to a maximum and minimum stress of 12,000 and 8,240 pounds per square inch, respectively.

Note.—The safe loads of Double Channel Struts are based upon the least radii of gyration equal to radii about axis perpendicular to web and do not apply in cases where the distance between channels would be less than one-half the depth of the channels.

Tables of Pins:—The tables for pins have been calculated for shearing, bending and bearing stresses. The stresses allowed, in pounds per square inch, are as follows:—

Single shearing stress,	-	10,000 lbs. per sq. in.
Bending stress,	- -	20,000 lbs. per sq. in.
Bearing stress,	- -	20,000 lbs. per sq. in.

H-SECTIONS AS STRUTS

Safe Loads in Pounds, for Direct Loads

Compressive Stresses, 15200-58 $\frac{l}{r}$ pounds per square inch

Length of Struts Feet	8″ H 34.0 Lbs.	6″ H 23.8 Lbs.	5″ H 18.7 Lbs.	4″ H 13.6 Lbs.	Length of Struts Feet
	Area 10.00 ins.² min. r 1.87 ins.	Area 7.00 ins.² min. r 1.45 ins	Area 5.50 ins.² min. r 1.20 ins.	Area 4.00 ins.² min. r 0.95 ins.	
5				48000 46150	5
6			66000 64460	43220	6
7		84000 82880	61270	40290	7
8		79520	58080	37360	8
9	120000 118500	76160	54890	34430	9
10	114780	72800	51700	31500	10
11	111060	69440	48510		11
12	107340	66080	45320		12
13	103610	62720			13
14	99890	59360			14
15	96170				15
16	92450				16
17	88730				17
18	85000				18

Safe loads above horizontal lines are based upon 12000 pounds per square inch, equivalent to ratio of $\frac{l}{r}=55$.

Maximum allowable ratio of $\frac{l}{r}=120$ is equivalent to a stress of 8240 pounds per square inch.

Courtesy Carnegie Steel Co.

H-SECTIONS AS BEAMS

Safe Loads in Pounds, for Uniformly Distributed Loads

Bending Stresses, 16,000 pounds per square inch

Length of Span, Feet.	8″ H 34.0 Lbs.	6″ H 23.8 Lbs.	5″ H 18.7 Lbs.	4″ H 13.6 Lbs.	Coefficients of Deflection
	I_{1-1} 115.42 ins.⁴ S_{1-1} 28.86 ins.³	I_{1-1} 45.12 ins.⁴ S_{1-1} 15.04 ins.³	I_{1-1} 23.77 ins.⁴ S_{1-1} 9.51 ins.³	I_{1-1} 10.69 ins.⁴ S_{1-1} 5.34 ins.³	
2				38800 28500	0.066
3				19000	0.149
4			34800 25350	14250	0.265
5		39970 32080	20280	11400	0.414
6	60640 51300	26740	16900	9500	0.596
7	43970	22920	14490	8140	0.811
8	38470	20050	12680	7130	1.059
9	34200	17820	11270	6330	1.341
10	30780	16040	10140	5700	1.655
11	27980	14580	9220	5180	2.003
12	25650	13370	8450	4750	2.383
13	23680	12340	7800	4380	2.797
14	21990	11460	7240	4070	3.244
15	20520	10690	6760	3800	3.724
16	19240	10030	6340	3560	4.237
17	18110	9440	5970		4.783
18	17100	8910	5630		5.363
19	16200	8440			5 975
20	15390	8020			6.621
21	14660				7.299
22	13990				8.011
23	13380				8.756
24	12820				9.534

DEFLECTION IN CENTER OF SPAN, IN INCHES

For loads uniformly distributed over span, $\frac{\text{coefficient}}{\text{depth of beam in inches.}}$

For loads concentrated in center of span, $\frac{4}{5}\times\frac{\text{coefficient}}{\text{depth of beam in inches.}}$

I-SECTIONS AS BEAMS

Safe Loads in Pounds, for Uniformly Distributed Loads

Bending Stresses, 16000 pounds per square inch

Length of Span, Feet	5″x3.00″ I 9.75 Lbs.	6″x3.33″ I 12.25 Lbs.	7″x3.66″ I 15 Lbs.	8″x4.00″ I 18 Lbs.	9″x4.33″ I 21 Lbs.	10″x4.69″ I 25 Lbs.	Coefficients of Deflection
3	21090 17200	26470 25820					0.149
4	12900	19370	32810 27600	38320 37920			0.265
5	10320	15490	22080	30330	44810 40260		0.414
6	8600	12910	18400	25280	33550	51690 43410	0.596
7	7370	11070	15770	21670	28760	37210	0.811
8	6450	9680	13800	18960	25160	32560	1.059
9	5730	8610	12270	16850	22370	28940	1.341
10	5160	7750	11040	15170	20130	26050	1.655
11	4690	7040	10040	13790	18300	23680	2.003
12	4300	6460	9200	12640	16780	21710	2.383
13	3970	5960	8490	11670	15480	20040	2.797
14	3690	5530	7890	10830	14380	18610	3.244
15	3440	5160	7360	10110	13420	17360	3.724
16	3220	4840	6900	9480	12580	16280	4.237
17	3030	4560	6500	8920	11840	15320	4.783
18	2870	4300	6130	8430	11180	14470	5.363
19		4080	5810	7980	10590	13710	5.975
20		3870	5520	7580	10070	13020	6.621
21			5260	7220	9590	12400	7.299
22			5020	6890	9150	11840	8.011
23				6590	8750	11320	8.756
24				6320	8390	10850	9.534
25					8050	10420	10.345
26					7740	10020	11.189
27						9650	12.066
28						9300	12.977
29							13.920
30							14.897
31							15.906
32							16.949
33							18.025

DEFLECTION IN CENTER OF SPAN IN INCHES

For loads uniformly distributed over span, $\frac{\text{coefficient}}{\text{depth of beam in inches.}}$

For loads concentrated in center of span. $\frac{4}{5}\times\frac{\text{coefficient}}{\text{depth of beam in inches}}$

I-SECTIONS AS BEAMS

Safe Loads in Pounds, for Uniformly Distributed Loads

Bending Stresses, 16000 pounds per square inch

Length of Span, Feet.	12″x5.00″ I 31.5 Lbs.	15″x5.50″ I 42 Lbs.	15″x6 00″ I 60 Lbs.	18″x6 00″ I 55 Lbs.	20″x6.25″ I 65 Lbs.	24″x7.00″ I 80 Lbs.	Coefficients of Deflection.
6	66380 63950		167920 144360				0.596
7	54810	91310 89750	123730				0.811
8	47960	78530	108270				1.059
9	42630	69810	96240	114960 104700			1.341
10	38370	62830	86610	94290	136060 124750		1.655
11	34880	57120	78740	85720	113400		2.003
12	31970	52360	72180	78570	103950		2.383
13	29510	48330	66630	72530	95960		2.797
14	27410	44880	61870	67350	89100	134430 132520	3.244
15	25580	41880	57740	62860	83160	123690	3.724
16	23980	39270	54130	58930	77970	115960	4.237
17	22570	36960	50950	55460	73380	109140	4.783
18	21320	34900	48120	52380	69300	103070	5.363
19	20190	33070	45590	49630	65660	97650	5.975
20	19180	31410	43310	47140	62370	92770	6.621
21	18270	29920	41240	44900	59400	88350	7.299
22	17440	28560	39370	42860	56700	84330	8.011
23	16680	27320	37660	40990	54240	80670	8.756
24	15990	26180	36090	39290	51980	77300	9.534
25	15350	25130	34650	37720	49900	74210	10.345
26	14760	24160	33310	36270	47980	71360	11.189
27	14210	23270	32080	34920	46200	68720	12.066
28	13700	22440	30930	33670	44550	66260	12.977
29	13230	21660	29870	32510	43020	63980	13.920
30	12790	20940	28870	31430	41580	61840	14.897
31		20270	27940	30420	40240	59850	15.906
32		19630	27070	29470	38980	57980	16.949
33		19040	26250	28570	37800	56220	18.025
34				27730	36690	54570	19.134
35				26940	35640	53010	20.276
36					34650	51540	21.451
37					33720	50140	22.659
38						48830	23.901
39						47570	25.175
40						46380	26.483

TABLES FOR PINS AND WEB BEARING

Two Pins required for each Strut

Load on Post Pounds	Distance Between Channels=Flange Width of Beam in Inches																	
	4		4½		5		5½		6		6½		7		7½		8	
	Dia. of Pin	Double Web Thickness Req'd	Dia. of Pin	Double Web Thickness Req'd	Dia. of Pin	Double Web Thickness Req'd	Dia. of Pin	Double Web Thickness Req'd	Dia. of Pin	Double Web Thickness Req'd	Dia. of Pin	Double Web Thickness Req'd	Dia. of Pin	Double Web Thickness Req'd	Dia. of Pin	Double Web Thickness Req'd	Dia. of Pin	Double Web Thickness Req'd
10000	1⅛	.222	1⅛	.222	1⅛	.222	1¼	.200	1¼	.200	1¼	.200	1¼	.200	1⅜	.182	1⅜	.182
20000	1⅜	.364	1⅜	.364	1½	.333	1½	.333	1⅝	.308	1⅝	.308	1⅝	.308	1⅝	.308	1¾	.286
30000	1⅝	.462	1⅝	.462	1⅝	.462	1¾	.429	1¾	.429	1⅞	.400	1⅞	.400	1⅞	.400	2	.375
40000	1¾	.571	1¾	.571	1⅞	.533	1⅞	533	2	.500	2	.500	2⅛	.471	2⅛	.471	2⅛	.471
50000	1⅞	.667	1⅞	.667	2	.625	2	.625	2⅛	.588	2⅛	.588	2¼	.556	2¼	.556	2⅜	.526
60000	2	.750	2	.750	2⅛	.706	2¼	.667	2¼	.667	2⅜	.632	2⅜	.632	2⅜	.632	2½	.600
70000	2⅛	.824	2⅛	.824	2¼	.778	2¼	.778	2⅜	.737	2⅜	.737	2½	.700	2½	.700	2⅝	.667
80000	2⅛	.941	2¼	.888	2⅜	.842	2⅜	.842	2½	.800	2½	.800	2⅝	.762	2⅝	.762	2¾	.727
90000	2¼	1.000	2⅜	.947	2⅜	.947	2½	.900	2⅝	.857	2⅝	.857	2¾	.818	2¾	.818	2⅞	.783
100000	2⅜	1.053	2⅜	1.053	2½	1.000	2⅝	.953	2⅝	.953	2¾	.909	2⅞	.870	2⅞	.870	3	.833
110000	2⅜	1.158	2½	1.100	2⅝	1.048	2⅝	1.048	2¾	1.000	2⅞	.957	2⅞	.957	3	.917	3	.917
120000	2½	1.200	2⅝	1.143	2⅝	1.143	2¾	1.091	2⅞	1.044	2⅞	1 044	3	1.000	3	1.000	3⅛	.960
130000	2½	1.300	2⅝	1.238	2¾	1.182	2⅞	1.131	2⅞	1.131	3	1.083	3⅛	1.040	3⅛	1.040	3¼	1.000
140000	2⅝	1.333	2¾	1 273	2⅞	1.218	2⅞	1.218	3	1.167	3⅛	1.120	3⅛	1.120	3¼	1.077	3¼	1.077
150000	2⅝	1.429	2¾	1.364	2⅞	1.305	3	1.250	3	1.250	3⅛	1.200	3¼	1.154	3¼	1.154	3⅜	1.111
160000	2¾	1.455	2⅞	1.392	3	1.333	3	1.333	3⅛	1.281	3¼	1.231	3¼	1.231	3⅜	1.185	3½	1.143
170000	2¾	1.546	2⅞	1.478	3	1.418	3⅛	1.362	3¼	1.308	3¼	1.308	3⅜	1.259	3⅜	1.259	3½	1.215
180000	2⅞	1.565	3	1.500	3	1.500	3⅛	1.440	3¼	1.385	3⅜	1.333	3⅜	1 333	3½	1.286	3⅝	1.242
190000	2⅞	1.652	3	1.585	3⅛	1.520	3¼	1.462	3⅜	1.408	3⅜	1.408	3½	1.357	3⅝	1.310	3⅝	1.310
200000	3	1.667	3	1.667	3⅛	1.600	3¼	1.539	3⅜	1.482	3½	1.429	3½	1.429	3⅝	1.380	3¾	1.333

EXAMPLE OF A PIN BEARING GANGWAY SUPPORT.

What will be the size required for a pin bearing gangway support, shown on page 20, for a load of 160,000 pounds uniformly distributed over a span of 9 feet between supporting struts, 16 feet in height, and what will be the deflection of beam?

Answer—Table of safe loads of I sections, page 33; nearest section for given load and span is a 20″ I 80 pounds, the deflection=

$$\frac{\text{coefficient of deflection}}{\text{depth of beam}}=\frac{1.341}{20}=0.67''.$$

Table of pins shown above; the load on post is $\frac{160000}{2}=80000$ pounds and the distance between channels=flange width of 20″ I 80 pounds=7″. Each of the two pins required for the given load and distance is 2⅝″ diameter, bearing 0.762″ on web of channels. Table of Channel Struts, page 34; the nearest channel strut for the given load, web thickness, and height, is one composed of 2-7″[s 14¾ pounds, with a capacity of 93,270 pounds and a double web thickness of 0.846″.

By the use of a larger pin the required web thickness can be correspondingly reduced.

Courtesy Carnegie Steel Co.

DOUBLE CHANNEL STRUTS

Safe Loads in Pounds, for Direct Loads

Compressive Stresses, 15200-58 $\frac{l}{r}$ pounds per square inch for lengths greater than $\frac{l}{r}=55$.

Compressive Stresses, 12000 pounds per square inch for lengths less than $\frac{l}{r}=55$.

Description of Channels			Unsupported Length in Feet					
Depth	Weight per Ft.	Double Web Thickness	10 and under	12	14	16	18	20
6	8.00	0.400	57120	55290	52450	49600	46760	43920
	10.50	0.636	74160	70480	66570	62650	58740	54830
	13.00	0.880	90810	85740	80680	75610	70550	65490
	15.50	1.126	106890	100540	94190	87840	81500	75150
7	9.75	0.420	68400	68400	66220	63300	60390	57470
	12.25	0.636	86400	86220	82350	78480	74610	70740
	14.75	0.846	104160	102940	98110	93270	88440	83610
	17.25	1.056	121680	119280	113470	107660	101850	96040
	19.75	1.266	139440	135330	128440	121560	114680	107790
8	11.25	0.440	80400	80400	80400	77850	74850	71850
	13.75	0.614	96960	96960	96480	92720	88960	85200
	16.25	0.798	114720	114720	113080	108480	103870	99270
	18.75	0.980	132240	132240	129430	123990	118550	113110
	21.25	1.164	150000	150000	146030	139750	133470	123190
9	13.25	0.460	93360	93360	93360	93430	90330	87230
	15.00	0.576	105840	105840	105840	105180	101570	97960
	20.00	0.904	141120	141120	141120	138080	133000	127910
	25.00	1.230	176400	176400	176400	170630	164030	157430
10	15.00	0.480	107040	107040	107040	107040	106710	103500
	20.00	0.764	141120	141120	141120	141120	138500	134030
	25.00	1.058	176400	176400	176400	176400	171120	165310
	30.00	1.352	211680	211680	211680	210690	203510	196330
	35.00	1.646	246960	246960	246960	244410	235850	227300
12	20.50	0.560	144720	144720	144720	144720	144720	144720
	25.00	0.780	176400	176400	176400	176400	176400	176400
	30.00	1.026	211680	211680	211680	211680	211680	210760
	35.00	1.272	246960	246960	246960	246960	246960	244120
	40.00	1.516	282240	282240	282240	282240	282240	277460
15	33.00	0.800	237600	237600	237600	237600	237600	237600
	35.00	0.852	246960	246960	246960	246960	246960	246960
	40.00	1.048	282240	282240	282240	282240	282240	282240
	45.00	1.244	317760	317760	317760	317760	317760	317760
	50.00	1.440	353040	353040	353040	353040	353040	353040
	55.00	1.636	388320	388320	388320	388320	388320	388320

WOODEN BEAMS AND POSTS

EXPLANATORY NOTES

Tables of Timber Beams:—The tables give the uniformly distributed safe loads of timber beams for various species of timber and are based upon the following values of maximum unit stresses.

Species of Timber.	Allowable Unit Stresses, in Lbs. per Sq. In.	
	Bending Stresses	Shearing Stresses
Oak	1200 lbs. per square inch	100 lbs. per square inch
Yellow Pine, Long Leaf	1200 " " "	70 " " "
Yellow Pine, Short Leaf	900 " " "	50 " " "
White Pine	700 " " "	40 " " "
Spruce	800 " " "	50 " " "

The loads given above horizontal lines in tables are the safe loads based upon the extreme shearing stresses given above and should not be exceeded for shorter spans, to avoid failure of beam by shearing.

For loads concentrated in the center of span, use one-half of the uniformly distributed safe load.

Coefficients of Deflection for Timber Beams:—Coefficients are given for maximum uniformly distributed loads based upon the extreme bending stresses given above and upon the following moduli of elasticity, in pounds per square inch:

Oak,	1,500,000	White Pine	1,000,000
Yellow Pine,	1,500,000	Spruce,	1,200,000

The deflection in the center of the span, in inches, is obtained by dividing the coefficient corresponding to the maximum safe load by the depth of the beam in inches.

Safe loads for rectangular timber beams may be obtained from the tables for square timber beams by direct proportion of width to width. The load for a 10″x12″ rectangular beam is 5-6 that of a 12″x12″, etc.

Tables of Timber Posts:—The safe loads given in tables are assumed to be centrally applied and are based upon the following compressive unit stresses.

Species of Timber	Compressive Unit Stress, in Lbs. per Sq. in.		
	General Formula	Maximum l/d=10	Minimum l/d=30
Oak	900—17 l/d	730	390
Yellow Pine, Long Leaf	1000—18 l/d	820	460
Yellow Pine, Short Leaf	¾(1000—18 l/d)	615	345
White Pine	800—15 l/d	650	350
Spruce	800—15 l/d	650	350

$\frac{l}{d}=\frac{\text{unsupported length of strut, in inches,}}{\text{least diameter or side, in inches}}$ the allowable ratio of l/d ranging between 10 and 30 equivalent to the maximum and minimum unit stresses given above.

Values given above horizontal lines are the maximum safe loads.

NOTE:—The safe loads given in the tables of timber beams and posts are for seasoned timber only; for green timber use two-thirds of the value shown.

COEFFICIENTS OF DEFLECTION FOR TIMBER BEAMS

Span Feet	Coefficients				Span Feet	Coefficients			
	Oak, Yellow Pine, L. L.	Yellow Pine, S. L.	White Pine	Spruce		Oak, Yellow Pine, L. L.	Yellow Pine, S. L.	White Pine	Spruce
1	0.024	0.018	0.021	0.020	21	10.584	7.938	9.261	8.820
2	0.096	0.072	0.084	0.080	22	11.616	8.712	10.164	9.680
3	0.216	0.162	0.189	0.180	23	12.696	9.522	11.109	10.580
4	0.384	0.288	0.336	0.320	24	13.824	10.368	12.096	11.520
5	0.600	0.450	0.525	0.500	25	15.000	11.250	13.125	12.500
6	0.864	0.648	0.756	0.720	26	16.224	12.168	14.196	13.520
7	1.176	0.882	1.029	0.980	27	17.496	13.122	15.309	14.580
8	1.536	1.152	1.344	1.280	28	18.816	14.112	16.464	15.680
9	1.944	1.458	1.701	1.620	29	20.184	15.138	17.661	16.820
10	2.400	1.800	2.100	2.000	30	21.600	16.200	18.900	18.000
11	2.904	2.178	2.541	2.420	31	23.064	17.298	20.181	19.220
12	3.456	2.592	3.024	2.880	32	24.576	18.432	21.504	20.480
13	4.056	3.042	3.549	3.380	33	26.136	19.602	22.869	21.780
14	4.704	3.528	4.116	3.920	34	27.744	20.808	24.276	23.120
15	5.400	4.050	4.725	4.500	35	29.400	22.050	25.725	24.500
16	6.144	4.608	5.376	5.120	36	31.104	23.328	27.216	25.920
17	6.936	5.202	6.069	5.780	37	32.856	24.642	28.749	27.380
18	7.776	5.832	6.804	6.480	38	34.656	25.992	30.324	28.880
19	8.664	6.498	7.581	7.220	39	36.504	27.378	31.941	30.420
20	9.600	7.200	8.400	8.000	40	38.400	28.800	33.600	32.000

DEFLECTION IN CENTER OF SPAN, IN INCHES

For loads uniformly distributed over span, $\frac{\text{coefficient}}{\text{depth of beam in inches}}$

For loads concentrated in center of span, $\frac{4}{5} \times \frac{\text{coefficient}}{\text{depth of beam in inches}}$

EXAMPLES FOR TIMBER TABLES

I. Required the maximum uniformly distributed safe load of an oak beam, 12" x 12", for a span of 18 feet, and the deflection.

Answer—Table for oak beams, page 38, shows for the given size and span a safe load of 12,800 pounds. The above table shows for this species and span a coefficient of 7.776, which, divided by the depth, 12", gives the deflection of 0.648 inch.

II. Find the size of a round collar, green spruce, to support 5,000 pounds in the center of a span of 14 feet.

Answer—5,000 pounds concentrated in center = 2x5,000 = 10,000 pounds uniformly distributed. 10,000 pounds safe load for green timber = $\frac{3}{2}$x10,000 = 15,000 pounds safe load for seasoned timber. Referring to table for spruce beams, page 47, the nearest size for this load is a 16 inch round.

III. What size square post of long leaf yellow pine, 12 feet long, is required to support a load of 100,000 pounds?

Answer—The table on page 50 shows for the given length and nearest load to 100,000 pounds a size of 12"x12"

SQUARE TIMBER BEAMS

OAK

Safe Loads in Pounds, for Uniformly Distributed Loads

Length of Span, Feet	8"x8"	10"x10"	12"x12"	14"x14"	16"x16"	18"x18"	20"x20"	22"x22"	24"x24"
8	8530 8530								
9	7590								
10	6830	13330 13330							
11	6210	12120							
12	5690	11110	19200 19200						
13	5250	10260	17720						
14	4880	9520	16460	26130 26130					
15	4550	8890	15360	24390					
16	4270	8330	14400	22870	34130 34130				
17	4020	7840	13550	21520	32130				
18	3790	7410	12800	20330	30340	43200 43200			
19		7020	12130	19260	28740	40930			
20		6670	11520	18290	27310	38880	53330 53330		
21		6350	10970	17420	26010	37030	50790		
22			10470	16630	24820	35350	48480	64530 64530	
23			10020	15910	23750	33810	46380	61730	
24			9600	15240	22760	32400	44440	59160	76800 76800
25				14640	21850	31100	42670	56790	73730
26				14070	21010	29910	41030	54610	70890
27				13550	20230	28800	39510	52580	68270
28					19510	27770	38100	50700	65830
29					18830	26810	36780	48960	63560
30					18200	25920	35560	47320	61440
31						25080	34410	45800	59460
32						24300	33330	44370	57600
33						23560	32320	43020	55850
34							31370	41760	54210
35							30480	40560	52660
36							29630	39440	51200
37								38370	49820
38								37360	48510
39								36400	47260
40								35490	46080

Courtesy Carnegie Steel Co.

ROUND TIMBER BEAMS

OAK

Safe Loads in Pounds, for Uniformly Distributed Loads

Length of Span, Feet	8" Dia.	10" Dia.	12" Dia.	14" Dia.	16" Dia.	18" Dia.	20" Dia.	22" Dia.	24" Dia.
6	7540 6700								
7	5750	11780 11220							
8	5030	9820	16960 16960						
9	4470	8730	15080						
10	4020	7850	13570	23090 21550					
11	3660	7140	12340	19590	30160 29250				
12	3350	6550	11310	17960	26810				
13	3090	6040	10440	16580	24750	38170 38170			
14	2870	5610	9690	15390	22980	32720	47120 44880		
15	2680	5240	9050	14370	21450	30540	41890	57020 55750	
16	2510	4910	8480	13470	20110	28630	39270	52270	67860 67860
17	2370	4620	7980	12680	18920	26940	36960	49190	63870
18	2230	4360	7540	11970	17870	25450	34910	46460	60320
19		4130	7140	11340	16930	24110	33070	44020	57140
20		3930	6790	10780	16090	22900	31420	41820	54140
21		3740	6460	10260	15320	21810	29920	39820	51700
22			6170	9800	14620	20820	28560	38010	49350
23			5900	9370	13990	19920	27320	36360	47210
24			5660	8980	13400	19090	26180	34850	45240
25				8610	12870	18320	25130	33450	43430
26				8290	12370	17620	24170	32170	41760
27				7980	11920	16970	23270	30970	40210
28					11490	16360	22440	29870	38780
29					11090	15800	21670	28840	37440
30					10720	15270	20940	27880	36190
31						14780	20270	26980	35020
32						14310	19640	26130	33930
33						13880	19040	25340	32900
34							18480	24600	31930
35							17950	23890	31020
36							17450	23230	30160
37								22600	29340
38								22010	28570
39								21440	27840
40								20910	27140

SQUARE TIMBER BEAMS

YELLOW PINE, LONG LEAF

Safe Loads in Pounds, for Uniformly Distributed Loads

Length of Span, Feet	8"x8"	10"x10"	12"x12"	14"x14"	16"x16"	18"x18"	20"x20"	22"x22"	24"x24"
12	5970 5690								
13	5250								
14	4880								
15	4550	9330 8890							
16	4270	8330							
17	4020	7840							
18	3790	7410	18400 12800						
19		7020	12130						
20		6670	11520	18890 18290					
21		6350	10970	17420					
22			10470	16630					
23			10020	15910	23890 23750				
24			9600	15240	22760				
25				14640	21850				
26				14070	21010	30240 29910			
27				13550	20230	28800			
28					19510	27770			
29					18830	26810	37330 36780		
30					18200	25920	35560		
31						25080	34410		
32						24300	33330	45170 44370	
33						23560	32320	43020	
34							31370	41760	
35							30480	40560	53760 52660
36							29630	39440	51200
37								38370	49820
38								37360	48510
39								36400	47260
40								35490	46080

ROUND TIMBER BEAMS

YELLOW PINE, LONG LEAF

Safe Loads in Pounds, for Uniformly Distributed Loads

Length of Span, Feet	8″ Dia.	10″ Dia.	12″ Dia.	14″ Dia.	16″ Dia.	18″ Dia.	20″ Dia.	22″ Dia.	24″ Dia.
	5280								
8	5030								
9	4470	8250							
10	4020	7850							
11	3660	7140	11880						
12	3350	6550	11310						
13	3090	6040	10440	16160					
14	2870	5610	9690	15390					
15	2680	5240	9050	14370	21110				
16	2510	4910	8480	13470	20110				
17	2370	4620	7980	12680	18920	26720			
18	2230	4360	7540	11970	17870	25450			
19		4130	7140	11340	16930	24110	32990		
20		3930	6790	10780	16090	22900	31420	39910	
21		3740	6460	10260	15320	21810	29920	39820	
22			6170	9800	14620	20820	28560	38010	47500
23			5900	9370	13990	19920	27320	36360	47210
24			5660	8980	13400	19090	26180	34850	45240
25				8620	12870	18320	25130	33450	43450
26				8290	12370	17620	24170	32170	41760
27				7980	11920	16970	23270	30970	40210
28					11490	16360	22440	29870	38780
29					11090	15800	21670	28840	37440
30					10720	15270	20940	27880	36190
31						14780	20270	26980	35020
32						14310	19640	26130	33930
33						13880	19040	25340	32900
34							18480	24600	31930
35							17950	23890	31020
36							17450	23230	30160
37								22600	29340
38								22010	28570
39								21440	27840
40								20910	27140

ROUND TIMBER BEAMS

YELLOW PINE, SHORT LEAF

Safe Loads in Pounds, for Uniformly Distributed Loads,

Length of Span, Feet	8″ Dia.	10″ Dia.	12″ Dia.	14″ Dia.	16″ Dia.	18″ Dia.	20″ Dia.	22″ Dia.	24″ Dia.
	3770								
8	3770								
9	3350	5890							
10	3020	5890							
11	2740	5360	8480						
12	2510	4910	8480						
13	2320	4530	7830	11550					
14	2150	4210	7270	11550					
15	2010	3930	6790	10780	15080				
16	1890	3680	6360	10100	15080				
17	1770	3470	5990	9510	14190	19090			
18	1680	3270	5660	8980	13400	19090			
19		3100	5360	8510	12700	18080	23580		
20		2950	5090	8080	12060	17180	23560		
21		2810	4850	7700	11490	16360	22400	28510	
22			4630	7350	10970	15620	21420	28510	
23			4430	7030	10490	14940	20490	27270	33930
24			4240	6740	10050	14310	19640	26130	33930
25				6470	9650	13740	18850	25090	32570
26				6220	9280	13210	18130	24120	31320
27				5990	8940	12720	17450	23230	30160
28					8620	12270	16820	22400	29080
29					8320	11850	16250	21630	28080
30					8040	11450	15710	20910	27140
31						11080	15200	20230	26270
32						10740	14730	19600	25450
33						10410	14280	19000	24680
34							13860	18450	23940
35							13460	17920	23270
36							13000	17420	22620
37								16950	22010
38								16510	21430
39								16080	20880
40								15680	20360

SQUARE TIMBER BEAMS

YELLOW PINE, SHORT LEAF

Safe Loads in Pounds, for Uniformly Distributed Loads

Length of Span, Feet	8″x8″	10″x10″	12″x12″	14″x14″	16″x16″	18″x18″	20″x20″	22″x21″	24″x24″
	4270								
12	4270								
13	3940								
14	3660	6870							
15	3410	6670							
16	3200	6250							
17	3010	5880	9600						
18	2840	5560	9600						
19		5260	9100						
20		5000	8640	13070					
21		4760	8230	13070					
22			7860	12470					
23			7510	11930	17070				
24			7200	11430	17070				
25				10980	16380				
26				10550	15750	21600			
27				10170	15170	21600			
28					14630	20830			
29					14120	20110	26670		
30					13650	19440	26670		
31						18810	25810		
32						18230	25000	32270	
33						17670	24240	32270	
34							23530	31320	
35							22860	30420	38400
36							22220	29580	38400
37								28780	37360
38								28020	36380
39								27300	35450
40								26620	34560

SQUARE TIMBER BEAMS

WHITE PINE

Safe Loads in Pounds, for Uniformly Distributed Loads

Length of Span, Feet	8″x8″	10″x10″	12″x12″	14″x14″	16″x16″	18″x18″	20″x20″	22″x22″	24″x24″
	3410								
12	3320								
13	3060								
14	2840	5380							
15	2650	5190							
16	2490	4860							
17	2340	4580	7680						
18	2210	4320	7470						
19		4090	7070						
20		3890	6720	10450					
21		3700	6400	10160					
22			6110	9700					
23			5840	9280	13450				
24			5600	8890	13270				
25				8540	12740				
26				8210	12250	17380			
27				7900	11800	16800			
28					11380	16200			
29					10990	15640	21830		
30					10620	15120	20740		
31						14630	20070		
32						14180	19440	25810	
33						13750	18860	25100	
34							18300	24360	30720
35							17780	23660	30720
36							17280	23000	29870
37								22380	29060
38								21790	28290
39								21240	27570
40								20700	26880

Courtesy Carnegie Steel Co.

ROUND TIMBER BEAMS

WHITE PINE

Safe Loads in Pounds, for Uniformly Distributed Loads

Length of Span, Feet	8″ Dia.	10″ Dia.	12″ Dia.	14″ Dia.	16″ Dia.	18″ Dia.	20″ Dia.	22″ Dia.	24″ Dia.
	3020								
8	2930								
9	2610	4710							
10	2350	4580							
11	2130	4170	6790						
12	1950	3820	6600						
13	1800	3520	6090	9240					
14	1680	3270	5650	8980					
15	1560	3050	5280	8380	12060				
16	1470	2860	4950	7860	11730				
17	1380	2700	4660	7400	11040	15270			
18	1300	2550	4400	6980	10430	14840			
19		2410	4170	6620	9880	14060	18850		
20		2290	3960	6290	9380	13360	18330		
21		2180	3770	5990	8940	12720	17450	22810	
22			3600	5710	8530	12150	16660	22170	
23			3440	5470	8160	11620	15940	21210	27140
24			3300	5240	7820	11130	15270	20330	26390
25				5030	7510	10690	14660	19510	25330
26				4840	7220	10280	14100	18760	24360
27				4660	69[illegible]0	9900	13570	18070	23460
28					6700	9540	13090	17420	22620
29					6470	9210	12640	16820	21840
30					6260	8910	12220	16260	21110
31						8620	11820	15740	20430
32						8350	11450	15240	19790
33						8100	11110	14780	19190
34							10780	14350	18630
35							10470	13940	18100
36							0180	13550	17590
37								13180	17120
38								12840	16670
39								12510	16240
40								12200	15830

ROUND TIMBER BEAMS

SPRUCE

Safe Loads in Pounds, for Uniformly Distributed Loads

Length of Span, Feet	8″ Dia.	10″ Dia.	12″ Dia.	14″ Dia.	16″ Dia.	18″ Dia.	20″ Dia.	22″ Dia.	24″ Dia.
	3770								
8	3350	5890							
9	2980	5820							
10	2680	5240	8480						
11	2440	4760	8230						
12	2230	4360	7540	11550					
13	2060	4030	6960	11050					
14	1920	3740	6460	10260	15080				
15	1790	3490	6030	9580	14300	19090			
16	1680	3270	5650	8980	13400	19090			
17	1580	3080	5320	8450	12620	17960	23560		
18	1490	2910	5000	7980	11920	16960	23270		
19		2760	4760	7560	11290	16070	22050	28510	
20		2620	4520	7180	10720	15270	20940	27880	
21		2490	4310	6840	10210	14540	19950	26550	
22			4110	6530	9750	13880	19040	25340	33930
23			3930	6250	9330	13280	18210	24240	31470
24			3770	5990	8940	12720	17450	23230	30160
25				5750	8580	12220	16700	22300	28950
26				5530	8250	11750	16110	21440	27840
27				5320	7940	11310	15510	20650	26810
28					7660	10910	14960	19910	25850
29					7400	10530	14440	19230	24960
30					7150	10180	13960	18580	24130
31						9850	13510	17990	23350
32						9540	13100	17420	22620
33						9250	12690	16900	21930
34							12320	16400	21290
35							11970	15930	20680
36							11640	15490	20110
37								15070	19560
38								14670	19050
39								14300	18560
40								13940	18100

Courtesy Carnegie Steel Co.

SQUARE TIMBER BEAMS

SPRUCE

Safe Loads in Pounds, for Uniformly Distributed Loads

Length of Span, Feet	8″x8″	10″x10″	12″x12″	14″x14″	16″x16″	18″x18″	20″x20″	22″x22″	24″x24″
	4270								
11	4140								
12	3790								
13	3500	6670							
14	3250	6350							
15	3030	5930	9600						
16	2840	5560	9600						
17	2680	5230	9040						
18	2530	4940	8530	13070					
19		4680	8080	12840					
20		4440	7680	12200					
21		4230	7310	11610	17070				
22			6980	11090	16550				
23			6680	10600	15840	21600			
24			6400	10170	15170	21600			
25				9760	14560	20740			
26				9380	14000	19940	26670		
27				9030	13480	19200	26340		
28					13000	18510	25390		
29					12550	17880	24520	32370	
30					12130	17280	23700	31550	
31						16720	22940	30530	38400
32						16200	22220	29580	38400
33						15710	21550	28680	37240
34							20910	27840	36140
35							20320	27040	35110
36							19750	26290	34130
37								25580	33210
38								24910	32340
39								24270	31510
40								23660	30720

SQUARE TIMBER POSTS

OAK

Safe Loads in Pounds, for Direct Loads

Length of Post, Feet	4″x4″	6″x6″	8″x8″	10″x10″	12″x12″	14″x14″	16″x16″	18″x18″	20″x20″
	11680								
4	11140	26880							
5	10320	26280							
6	9500	25060	46720						
7	8690	23830	46180						
8	7870	22610	44540	73000					
9	7060	21380	42910	71640	105120				
10	6240	20160	41280	69600	105120				
11		18940	39650	67560	102670	143080			
12		17710	38020	65520	100220	142130			
13		16490	36380	63480	97780	139270	186880		
14		15260	34750	61440	95330	136420	184700	236520	
15		14040	33120	59400	92880	133560	181440	236520	
16			31490	57360	90430	130700	178180	232850	292000
17			29860	55320	87980	127850	174910	229180	290640
18			28220	53280	85540	124990	171650	225500	286560
19			26590	51240	83090	122140	168380	221830	282480
20			24960	49200	80640	119280	165120	218160	278400
22				45120	75740	113570	158590	210820	270240
24				41040	70850	107860	152060	203470	262080
26					65950	102140	145540	196130	253920
28					61060	96430	139010	188780	245760
30					56160	90720	132480	181440	237600

ROUND TIMBER POSTS

OAK

Safe Load in Pounds, for Direct Loads

Length of Post, Feet	4" Dia.	6" Dia	8" Dia.	10" Dia.	12" Dia.	14" Dia.	16" Dia.	18" Dia.	20" Dia.
4	9170 8750								
5	8110	20640 20640							
6	7470	19680							
7	6820	18720	36690 36270						
8	6180	17760	34990						
9	5540	16800	33700	57380 56270					
10	4900	15830	32420	54660	82560 82560				
11		14870	31140	53060	80640				
12		13910	29860	51460	78720	112380 111630			
13		12950	28580	49860	76790	109380			
14		11990	27290	48260	74870	107140	146780 145070		
15		11030	26010	46650	72950	104900	142500	185760 185760	
16			24730	45050	71030	102660	139940	182880	
17			23450	43450	69100	100410	137380	180000	229340 228270
18			22170	41850	67180	98170	134810	177110	225060
19			20890	40240	65260	95930	132250	174230	221860
20			19600	38640	63340	93680	129690	171340	218660
22				35440	59490	89200	124560	165570	212250
24				32230	55640	84710	119430	159810	205840
26					51800	80220	114300	154040	199430
28					47950	75740	109180	148270	193020
30					44110	71250	104050	142500	186610

SQUARE TIMBER POSTS

YELLOW PINE, LONG LEAF

Safe Loads in Pounds, for Direct Loads

Length of Post, Feet	4"x4"	6"x6"	8"x8"	10"x10"	12"x12"	14"x14"	16"x16"	18"x18"	20"x20"
4	12 0 12540								
5	11680	29520 29520							
6	10820	28220							
7	9950	26930	524 0 51900						
8	9090	25630	50180						
9	8220	24340	48450	82000 80560					
10	7360	23040	46720	78400	8080 118080				
11		21740	44990	76240	115490				
12		20450	43260	74080	112900	60720 159710			
13		19150	41540	71920	110300	156690			
14		17860	39810	69760	107710	153660	209920 207620		
15		16560	38080	67600	105120	150640	204160	265680 265680	
16			36350	65440	102530	147620	200700	261790	
17			34620	63280	99940	144590	197250	257900	328000 326560
18			32900	61120	97340	141570	193790	254020	322240
19			31170	58960	94750	138540	190340	250130	317920
20			29440	56800	92160	135520	186880	246240	313600
22				52480	86980	129470	179970	238460	304960
24				48160	81790	123420	173060	230690	296320
26					76610	117380	166140	222910	287680
28					71420	111330	159230	215140	279040
30					66240	105280	152320	207360	270400

ROUND TIMBER POSTS

YELLOW PINE, LONG LEAF

Safe Loads in Pounds, for Direct Loads

Length of Post, Feet	4" Dia.	6" Dia.	8" Dia.	10" Dia.	12" Dia.	14" Dia.	16" Dia.	18" Dia.	20" Dia.
4	10300 9850								
5	9170	23190 23190							
6	8500	22170							
7	7820	21150	41220 40770						
8	7140	20130	39410						
9	6460	19110	38050	64400 63270					
10	5780	18100	36700	61580	92740 92740				
11		17080	35340	59880	90700				
12		16060	33980	58180	88670	126230 125440			
13		15040	32620	56490	86630	123060			
14		14020	31270	54790	84600	120690	164870 163060		
15		13010	29910	53090	82560	118310	160350	208670 208670	
16			28550	51400	80530	115940	157630	205610	
17			27190	49700	78490	113560	154920	202560	257610 256480
18			25840	48000	76450	111190	152200	199500	253090
19			24480	46310	74420	108810	149490	196450	249690
20			23120	44610	72380	106440	146780	193400	246300
22				41220	68310	101690	141350	187290	239520
24				37830	64240	96940	135920	181180	232730
26					60170	92190	130490	175080	225940
28					56100	87440	125060	168970	219160
30					52030	82690	119630	162860	212370

SQUARE TIMBER POSTS

. YELLOW PINE, SHORT LEAF

Safe Loads in Pounds, for Direct Loads

Length of Post, Feet	4"x4"	6"x6"	8"x8"	10"x10"	12"x12"	14"x14"	16"x16"	18"x18"	20"x20"
4	9840 9410								
5	8760	22140 22140							
6	8110	21170							
7	7460	20200	39360 38930						
8	6820	19220	37630						
9	6170	18250	36340	61500 60420					
10	5520	17280	35040	58800	88560 88560				
11		16310	33740	57180	86620				
12		15340	32450	55560	84670	120540 119780			
13		14360	31150	53940	82730	117520			
14		13390	29860	52320	80780	115250	157400 155710		
15		12420	28560	50700	78840	112980	153120	199260 199260	
16			27260	49080	76900	110710	150530	196340	
17			25970	47460	74950	108440	147940	193430	246000 244920
18			24670	45840	73010	106180	145340	190510	241680
19			23380	44220	71060	103910	142750	187600	238440
20			22080	42600	69120	101640	140160	184680	235200
22				39360	65230	97100	134980	178850	228720
24				36120	61340	92570	129790	173020	222240
26					57460	88030	124610	167180	215760
28					53570	83500	119420	161350	209280
30					49680	78960	114240	155520	202800

Courtesy Carnegie Steel Co.

ROUND TIMBER POSTS

YELLOW PINE, SHORT LEAF

Safe Loads in Pounds, for Direct Loads

Length of Post, Feet	4" Dia.	6" Dia.	8" Dia.	10" Dia.	12" Dia.	14" Dia.	16" Dia.	18" Dia.	20" Dia.
	7730								
4	7390	17890							
5	6880	17390							
6	6370	16630	30910						
7	5860	15860	30570						
8	5350	15100	29560	48800					
9	4850	14340	28540	47450	69550				
10	4340	13570	27520	46180	69550				
11		12810	26500	44910	68030	94670			
12		12050	25490	43640	66500	94080			
13		11280	24470	42370	64970	92300	123650		
14		10520	23450	41090	63450	90520	122300	156500	
15		9760	22430	39820	61920	88730	120260	156500	
16			21410	38550	60390	86950	118230	154210	198210
17			20400	37280	58870	85170	116190	151920	192360
18			19380	36000	57340	83390	114150	149630	189820
19			18360	34730	55810	81610	112120	147340	187270
20			17340	33460	54290	79830	110080	145050	184730
22				30910	51230	76270	106010	140470	179640
24				28370	48180	72700	101940	135890	174550
26					45130	69140	97870	131310	169460
28					42070	65580	93800	126730	164370
30					39020	62020	89720	122150	159280

SQUARE TIMBER POSTS

WHITE PINE, SPRUCE

Safe Loads in Pounds, for Direct Loads

Length of Post, Feet	4"x4"	6"x6"	8"x8"	10"x10"	12"x12"	14"x11"	16"x16"	18"x18"	20"x20"
	10400								
4	9920	23400							
5	9200	23400							
6	8480	22320	41600						
7	7760	21240	41120						
8	7040	20160	39680	65000					
9	6320	19080	38240	63800	93600				
10	5600	18000	36800	62000	93600				
11		16920	35360	60200	91440	127400			
12		15840	33920	58400	89280	126560			
13		14760	32480	56600	87120	124040	166400		
14		13680	31040	54800	84960	121520	164480	210600	
15		12600	29600	53000	82800	119000	161600	210600	
16			28160	51200	80640	116480	158720	207360	260000
17			26720	49400	78480	113960	155840	204120	258800
18			25280	47600	76320	111440	152960	200880	255200
19			23840	45800	74160	108920	150080	197640	251600
20			22400	44000	72000	106400	147200	194400	248000
22				40400	67680	101360	141440	187920	240800
24				30800	63360	96320	135680	181440	233600
26					59040	91280	129920	174960	226400
28					54720	86240	124160	168480	219200
30					50400	81200	118400	162000	212000

ROUND TIMBER POSTS

WHITE PINE, SPRUCE

Safe Loads in Pounds, for Direct Loads

Length of Post, Feet	4" Dia.	6" Dia.	8" Dia.	10" Dia.	12" Dia.	14" Dia.	16" Dia.	18" Dia.	20" Dia.
	8170								
4	7790	18880							
5	7230	18380							
6	6660	17530	32670						
7	6100	16680	32300						
8	5530	15830	31170	51050					
9	4960	14990	30030	50110	73510				
10	4400	14140	28900	48700	73510				
11		13290	27770	47280	71820	100060			
12		12440	26640	45870	70120	99400			
13		11590	25510	44450	68420	97420	130690		
14		10740	24380	43040	66730	95440	129180	165410	
15		9900	23250	41630	65030	93460	126920	165410	
16			22120	40210	63340	91480	124660	162860	204900
17			20990	38800	61640	89500	122400	160320	203260
18			19860	37390	59940	87530	120140	157770	200430
19			18720	35970	58250	85550	117870	155230	197610
20			17590	34560	56550	83570	115610	152680	194780
22				31730	53160	79610	111090	147590	189120
24				28900	49760	75650	106560	142500	183470
26					46370	71690	102040	137410	177820
28					42980	67730	97520	132320	172160
30					39580	63780	92990	127240	166510

LUMBER TABLE

Size in inches	LENGTHS IN FEET							
	10	12	13	14	16	18	20	22
1 x 2	1⅔	2	2⅙	2⅓	2⅔	3	3⅓	3⅔
1 x 3	2½	3	3¼	3½	4	4½	5	5½
1 x 3½	2 11/12	3½	3 19/24	4 1/12	4⅔	5¼	5⅚	6 5/12
1 x 4	3⅓	4	4⅓	4⅔	5⅓	6	6⅔	7⅓
1 x 5	4⅙	5	5 5/12	5⅚	6⅔	7½	8⅓	9⅙
1 x 6	5	6	6½	7	8	9	10	11
1 x 8	6⅔	8	8⅔	9⅓	10⅔	12	13⅓	14⅔
1 x 9	7½	9	9¾	10½	12	13½	15	16½
1 x 10	8⅓	10	10⅚	11⅔	13⅓	15	16⅔	18⅓
1 x 12	10	12	13	14	16	18	20	22
1 x 13	10⅚	13	14 1/12	15⅙	17⅓	19½	21⅔	23⅚
1 x 14	11⅔	14	15⅙	16⅓	18⅔	21	23⅓	25⅔
5/4 x 3	3⅛	3¾	4 1/16	4⅜	5	5⅝	6¼	6⅞
5/4 x 4	4⅙	5	5 5/12	5⅚	6⅔	7½	8⅓	9⅙
5/4 x 5	5 5/24	6¼	6 37/48	7 7/24	8⅓	9⅜	10 5/12	11 11/24
5/4 x 6	6¼	7½	8⅛	8¾	10	11¼	12½	13¾
5/4 x 8	8⅓	10	10⅚	11⅔	13⅓	15	16⅔	18⅓
5/4 x 9	9⅜	11¼	12 3/16	13⅛	15	16⅞	18¾	20⅝
5/4 x 10	10 5/12	12½	13 13/24	14 7/12	16⅔	18¾	20⅚	22 11/12
5/4 x 12	12½	15	16¼	17½	20	22½	25	27½
2 x 3	5	6	6½	7	8	9	10	11
2 x 4	6⅔	8	8⅔	9⅓	10⅔	12	13⅓	14⅔
2 x 9	15	18	19½	21	24	27	30	33
2 x 10	16⅔	20	21⅔	23⅓	26⅔	80	33⅓	36⅔
4 x 4	13⅓	16	17⅓	18⅔	21⅓	24	26⅔	29⅓
5 x 5	20⅚	25	27 1/12	29⅙	33⅓	37½	41⅔	45⅚
6 x 6	30	83	39	42	48	54	60	66
8 x 8	53⅓	64	69⅓	74⅔	85⅓	96	106⅔	117⅓
8 x 10	66⅔	80	86⅔	93⅓	106⅔	120	133⅓	149⅔

Courtesy Carnegie Steel Co.

Board Measure

Number of Feet, Board Measure, per Lineal Foot for Various Widths and Thicknesses.

Width of Board, In.	Thickness of Board, Inches												
	1	1½	2	2½	3	3½	4	5	6	7	8	9	10
3	0.250	0.375	0.500	0.625	0.750	....	....	....	....	....	....	....	....
3½	.292	.438	.583	.729	.875	1.021	....	....	....	....	....	....	....
4	.333	.500	.667	.833	1.000	1.167	1.333	....	....	....	....	....	....
4½	.375	.563	.750	.938	1.125	1.313	1.500	....	....	....	....	....	....
5	.417	.625	.833	1.042	1.250	1.457	1.666	2.083	....	....	....	....	....
6	.500	.750	1.300	1.250	1.500	1.750	2.000	2.500	3.000	....	....	....	....
7	.583	.875	1.167	1.458	1.750	2.042	2.333	2.917	3.500	4.083	....	....	....
8	.667	1.000	1.333	1.667	2.000	2.333	2.667	3.333	4.000	4.667	5.333	....	....
9	.750	1.125	1.500	1.875	2.250	2.625	3.000	3.750	4.500	5.250	6.000	6.750	....
10	.833	1.250	1.667	2.083	2.500	2.917	3.333	4.167	5.000	5.833	6.667	7.500	8.333
11	.917	1.375	1.833	2.292	2.750	3.208	3.667	4.583	5.500	6.417	7.333	8.250	9.167
12	1.000	1.500	2.000	2.500	3.000	3.500	4.000	5.000	6.000	7.000	8.000	9.000	10.00
13	1.083	1 625	2.167	2.708	3.250	3.792	4.333	5.417	6.500	7.583	8.667	9.750	10.83
14	1.167	1.750	2.333	2.917	3.500	4.083	4.667	5.833	7.000	8.167	9.333	10.50	11.67
15	1.250	1.875	2.500	3.125	3.750	4.375	5.000	6.250	7.500	8.750	10.00	11.25	12.50
16	1.333	2.000	2.667	3.333	4.000	4.667	5.333	6.667	8.000	9.333	10.67	12.00	13.33
18	1.500	2.250	3.000	3.750	4.500	5.250	6.000	7.500	9.000	10.50	12.00	13.50	15.00
20	1.667	2.500	3.333	4.167	5.000	5.833	6.667	8.333	10.00	11.67	13.33	15.00	16.67

SPECIFIC GRAVITY AND WEIGHT OF WOOD

	Gravity Specific	Average Specific Gravity	Weight per Cubic Foot Pounds
Alder	0.56 to 0.80	0.68	42
Apple	.73 to .79	.76	47
Ash	.60 to .84	.72	45
Bamboo	.31 to .40	.35	22
Beech	.62 to .85	.73	46
Birch	.56 to .74	.65	41
Box	.91 to 1.33	1.12	70
Cedar	.49 to .75	.62	39
Cherry	.61 to .72	.66	41
Chestnut	.46 to .66	.56	35
Cork	.24 to ...	.24	15
Cypress	.41 to .66	.53	33
Dogwood	.76 to ...	.76	47
Ebony	1.13 to 1.33	1.23	76
Elm	.55 to .78	.61	38
Fir	.48 to .70	.59	37
Gum	.84 to 1.00	.92	57
Hackmatack	.59 to ...	.59	37
Hemlock	.36 to .41	.38	24
Hickory	.69 to .94	.77	48
Holly	.76 to ...	.76	47
Hornbeam	.76 to ...	.76	47
Juniper	.56 to ...	.56	35
Larch	.56 to ...	.56	35
Lignum Vitae	.65 to 1.33	1.00	62
Linden	.604 to ...	...	37
Locust	.728 to ...	...	46
Mahogany	.56 to 1.06	.81	51
Maple	.57 to .79	.68	42
Mulberry	.56 to .90	.73	46
Oak, Live	.96 to 1.26	1.11	69
Oak, White	.69 to .86	.77	48
Oak, Red	.73 to .75	.74	46
Pine, White	.35 to .55	.45	28
Pine, Yellow	.46 to .76	.61	38
Poplar	.38 to .58	.48	30
Spruce	.40 to .50	.45	28
Sycamore	.59 to .62	.60	37
Teak	.66 to .98	.82	51
Walnut	.50 to .67	.58	36
Willow	.49 to .59	.54	34

Cast iron is approximately 17½ times heavier than ordinary kiln-dried wood used in common patterns.

STRENGTH OF MATERIALS

Stresses per Square Inch

Metals and Alloys	Stresses in Thousands of Pounds					Modulus of Elasticity, Pounds	Elongation, %
	Tension, Ultimate	Elastic Limit	Compression, Ultimate	Bending, Ultimate	Shearing, Ultimate		
Aluminum, cast	15	6 5	12		12	11,000,000	
" bars, sheets	24-28	12-14					
" wire, hard	30-65	16-30					
" " annealed	20-35	14					
" 2—7% Ni, Cu, Fe, etc.	40-50	25					
Aluminum Bronze, 5% to 7½% Al.	75	40	120				
" " 10% Al.	85-100	60					
Copper, cast	25	6	40	22	30	10,000,000	
" plates, rods, bolts	32-35	10	32				
" wire, hard	55-65					18,000,000	
" wire, annealed	36	10				15,000,000	
Brass, 17% Zn	32.6	8.2		23 2			26.7
" 23% "		7.6	42	22 3			35.8
" 30% "	28.1	8 6		26.9			20.7
" 39% "	41.1	17 4	75	39			20.7
" 50% "	31	17.9	117	33.5			5.0
" cast, common	18-24	6	30	20	36	9,000,000	
" wire, hard	80						
" " annealed	50	16				14,000,000	
Bronze 8% Sn	28 5	19	42	43.7		10,000,000	5.5
" 13% "	29.4	20	53	34.5			3.3
" 20% "	33		78	56.7			0.04
" 24% "	22	22	114	32			0
" 30% "	5.6	5 6	147	12.1			0
" gun metal, 9 Cu 1Sn.	25-55	10		52		10,000,000	
" Manganese, cast } 10% Sn.	60	30	125				
" " rolled } 2% Mn.	100	80					
" Phosphorus, cast } 9% Sn	50	24					
" " wire } 1% P.	100						
" Silicon, cast, 3% Si	55						
" " " 5% Si	75						
" " wire	108						
" Tobin, cast } 38% Zn.	66						
" " rolled } 1½% Sn	80	40				4,500,000	
" " cold rolled } ⅓% Pb.	100						
Delta Metal, cast } 55—60% Cu	45						
" " plates } 38—40% Zn.	68						
" " bars } 2— 4% Fe.	85						
" " wire } 1— 2% Sn.	100						
German Silver, 25% Zn, 20% Ni							
Gold, cast	20	4				8,000,000	
" wire.	30						
" copper, 5 Au, 1 Cu	50						
Lead, cast	1 8					1,000,000	
" pipe, wire	2.2-2 5					1,000,000	
" rolled sheets	3 3					720,000	
Platinum, wire, unannealed	53						
" " annealed	32						
Silver, cast	40						
Tin, cast	3.5-4.6	1.5-1.8	6	4		4,000,000	
" antimony, 10 Sn, 1 Sb	11						
Zinc, cast	4-6	4	18	7		13,000,000	
" rolled sheets	7-16						

STRENGTH OF MATERIALS

Stresses in Pounds per Square Inch

Building Materials	Ultimate Average Stresses			Modulus of Elasticity	Safe Working Stresses		
	Compress.	Tension	Bending		Compress.	Bearing	Shearing
Stone							
Bluestone	12,000	1,200	2,500	7,000,000	1,200	1,200	200
Granite, gneiss	12,000	1,200	1,600	7,000,000	1,200	1,200	200
Limestone, marble	8,000	800	1,500	7,000,000	800	800	150
Sandstone	5,000	150	1,200	3,000,000	500	500	150
Slate	10,000	3,000	5,000	14,000,000	1,000	1,000	175
Brick							
Common, good	10,000	200	600				
" medium burned	11,000						
" hard burned	15,000						
Pressed and paving	6,000						
Cement, Portland							
Neat, 28 days	7,040	740					
" 90 days	7,350	740					
1:3 sand, 28 days	1,290	320					
" 90 days	1,490	340					
Concrete, P. C.							
1:1½:3, hard stone	2,650						
" soft stone	1,800						
" cinders	700						
1: 2 :4, hard stone	2,100						
" soft stone	1,500						
" cinders	600						
1:2½:5, hard stone	1,700						
" soft stone	1,200						
" cinders	500						
1: 3 :6, hard stone	1,350						
" soft stone	1,000						
" cinders	400						
Masonry							
Granite					420	600	
Limestone, bluestone					350	500	
Sandstone					280	400	
Rubble					140	250	
" coursed					168	250	
Concrete, P. C., 1: 2 :4					350	600	
" " 1:2½:5					280	500	
Brick, common					168	300	
" hard burned					210	300	
Miscellaneous							
Glass, common	30,000	3,000	3,000	8,000,000			
" flooring	10,000	3,000	3,000				
Plaster	700	70					
Terra cotta	5,000						
Ropes, cast steel hoisting		80,000					
" standing, derrick		70,000					
" manila		8,000					
Belts, solid woven, cotton		7,300					
" " " flax		9,900					

Reinforced Concrete—Safe Working Stresses *

Elastic Modulus	2,000,000 if ult. compression is up to 2,200. 2,500,000 if ult. compression is over 2 200. 3,000,000 if ult. compression is over 2,900.
Compression	22.5% of ult. compression on piers or columns of lengths not exceeding 12 dia.
Bearing	32.5% of ult. compression on surfaces of at least twice the loaded area.
Shearing.	2.0% of ult. compression, horizontal bars. 3.0% for reinforcement with bent-up bars. 6.0% for thoroughly reinforced webs.
Bond	4% of ult. compression for plain bars. 2% for drawn wire.

For ultimate and working stresses of Structural Timber, see page 319.

*For complete data, see Proceedings of the American Society of Civil Engineers, Vol. XXXIX, No. 2, February, 1913.

STRENGTH OF MATERIALS

Stresses per Square Inch

Metals and Alloys	Stresses in Thousands of Pounds					Modulus of Elasticity, Pounds	Elongation, %	Reduction of Area, %
	Tension, Ultimate	Elastic Limit	Compression, Ultimate	Bending, Ultimate	Shearing, Ultimate			
Steel								
Structural Shapes, plates*								
" bridges	60	½ tens.	tensile	tensile	¾ tens.	29,000,000	25	
" buildings	55-65	"	"	"	"	29,000,000	25 21	
" ships	55-65	"	"	"	"	29,000,000	27-23	
Boiler Plates*								
" " flange	55-65	½ tens.	tensile	tensile	¾ tens.	29,000,000	27-23	
" " fire box	52-62	"	"	"	"	29,000,000	29-24	
" " extra soft	45-55	"	"	"	"	29,000,000	33-27	
Rivets*								
" bridges	50	½ tens	tensile	tensile	¾ tens.	29,000,000	30	
" buildings, ships	48-58	"	"	"	"	29,000,000	29-24	
Reinforcement Bars**								
" structural, plain	55-70	33	tensile	tensile	¾ tens.	29,000,000	25-20	
" " deformed	55-70	33	"	"	"	29,000,000	22-18	
" hard, plain	80 min.	50	"	"	"	29,000,000	15	
" " deformed	80 min.	50	"	"	"	29,000,000	12.5	
" cold twisted		55	"	"	"	29,000,000	5	
Castings*								
" bridges	65	½ tens.	tensile	tensile	¾ tens.		18	
" ships	60	"	"	"	"		18	
Forgings*								
" soft, low carbon	58	29	tensile	tensile	¾ tens.		28	28
" carbon, not annealed	75	37.5	"	"	"		18	30
" " annealed	70-80	35-40	"	"	"		24-22	30-35
" " oil tempered	80-90	45-55	"	"	"		23-20	40-45
" locomotive	80	40	"	"	"		20	25
" nickel, annealed	80	45-50	"	"	"		24-25	40-45
" " oil tempered	85-95	55-65	"	"	"		24-21	45-50
" axles, carbon steel	80	40	"	"	"		20	25
" " nickel	80	50	"	"	"		25	45
Steel Alloys								
Nickel Steel, 3—4% Ni.								
" shapes, plates	80 min.	50 min	tensile	tensile	¾ tens.		20	
" rivets	70-85	45 min.	"	"	"		23-19	
Copper Steel, 0.5% Cu	60-68	37-38	"	"	"		23-29	48-53
Steel Springs and Wire								
Springs, untempered	65-115	40-70						
Wire, unannealed	120	60						
" annealed	80	40						
" bridge cable	200	95						
Wrought Iron								
Shapes	48	26	tensile	tensile	5/6 tens	28,000,000		
Bars	50	27	"	"	"	28,000,000		
Wire, unannealed	80					15,000,000		
" annealed	60	27				25,000,000		
Cast Iron								
Common	15-18	6	80	30	18-20	12,000,000		
Gray	18-24			25-33				
Malleable	27-35	15-20	46	30	40			

*See Specifications of the Society of Testing Materials, adopted August 16, 1909.

**See Specifications of the Association of American Manufacturers, adopted 1910.

Stone Work

Stone walls are measured by the perch (24¾ cubic feet). Openings less than 3 feet wide are counted solid; over 3 feet are deducted, but 18 inches are added to the running measure for each jamb built. Arches are counted solid from their spring. Corners of buildings are measured twice. Pillars less than 3 feet are counted on three sides as lineal, multiplied by fourth side and depth.

It is customary to measure all foundation and dimension stone by the cubic foot. Water tables and base courses by lineal feet. All sills and lintels or ashlar, by superficial feet, and no walls less than 18 inches thick.

The greatest safe load per super. foot on:—

Granite piers	equals	40 tons.
Limestone piers	"	25 "
Sandstone piers	"	15 "
Brickwork in cement	"	3 "
Rubble masonry	"	2 "
Lime Concrete foundations	"	2½"

The height of brick or stone piers should not exceed twelve times their least thickness at base.

Brick Work

Brick work is generally measured by 1000 brick laid in the wall. In consequence of variations in size of bricks, no rule for volume of brick can be exact. The following scale is, however, a fair average:

7	bricks	to a super.	foot	4″	wall	equals	40 lbs.
14	"	"	"	9″	"	"	94 "
21	"	"	"	13″	"	"	121 "
28	"	"	"	18″	"	"	168 "
35	"	"	"	22″	"	"	210 "

Corners are not measured twice as in stone work. Openings over 2 feet square are deducted. Arches are counted from the spring. Fancy work counted 1½ bricks for 1. Pillars are measured on their face only.

A cubic yard of mortar requires 1 cubic yard of sand and 9 bushels of lime, and will fill 30 hods.

One thousand bricks, closely stacked, occupy about 56 cubic feet.

One thousand old bricks, cleaned and loosely stacked, occupy about 72 cubic feet.

One superficial foot of gauged arches requires 10 bricks.

Stock bricks commonly measure 8¾ inches by 4¼ inches by 2¾ inches and weigh from 5 to 6 pounds each.

Paving bricks should measure 9 inches by 4½ inches by 1¾ inches, and weigh about 4½ pounds each.

One yard of paving requires 36 stock bricks, of above dimensions, laid flat, or 52 on edge; and 35 paving brick laid flat, or 82 on edge.

Courtesy Waverly Oil Works Co.

Concrete in Mine Construction

†By H. Colin Campbell.

Increasing scarcity of timber of dimensions suitable for the usual requirements of underground mine construction has, for some years, been a serious problem. This has led to the use of concrete in various ways for many of the requirements heretofore met by timber. Concrete is now being used for lining and fireproofing old frame structures inside and outside the mine, fireproofing and rustproofing structural steel, building stopping, sealing loose rock, waterproofing surfaces which disintegrate under the action of moist air, and in the form of pre-cast units is serving as mine "timber."

Not the least important of the many distinctive advantages possessed by concrete in mine work is the security afforded against fire, which is a constant menace in coal mining. Permanence, which concrete construction expresses in the greatest degree, does away also with the continual maintenance expense necessary to replace timbering which under most mine conditions is short lived.

In a paper by A. F. Allard, chief engineer of the Bunsen Coal Co., Danville, Illinois, will be found a summary of practice in the use of concrete in the mines of Bunsen Coal Co. Mr. Allard is a strong advocate of concrete in mine work. To quote him partly:

> "As a fireproof and permanent material for the lining of shaft walls, concrete is without a rival, and its adaptability for this class of work is well recognized; judging by the large number of concrete shafts, now being constructed. In fact, we have hoisting and ventilating shafts completed from top to bottom without a piece of timber, the lining walls, cross-buntons, and division wall of the air compartment are of concrete, with the guides and stairways of steel. The method of sinking mine shafts by means of the concrete caisson with a steel cutting edge or shoe, through soft and water bearing strata has come into prominent use, for by its weight, penetration to a great depth is possible, rapid sinking progress is made, the flow of water met with is reduced and a great saving in cost of labor and material is obtained by the omission of timber curbing.
>
> From comparative cost data, I find that price per vertical floor of completed concrete lined shaft to be about one-third more than that of the wooden structure; this amount is in the first cost only, for after a few years' time, renewal of timbers would be necessary in the latter."

In the limited space at our disposal it is impossible to cite the numerous instances where concrete is now replacing timber in underground mine workings. One of the most notable and recent instances is that of the Oliver Iron Mining Co., on the Missabe Iron Range, where five shafts, constructed last summer, are lined with concrete sets, while five power plants to operate the shafts are being constructed of concrete block. This work was described in "Engineering Record" for October 31, 1914, reproductions of photographs and drawings illustrating the application of concrete in this particular instance. The experience of the Oliver Iron Mining Co. discloses that timber shaft lining soon decays, and that after 4 or 5 years, shafts so lined require continual and heavy maintenance expenditures, so designs were worked out to substitute concrete mine "timbers" in place of wood. Shaft members were cast in steel forms to shapes of exactly the same dimensions of timber sets for the same size of shaft, thus making unnecessary any changes in the various standards of equipment previously worked out and already in use.

Cement-concrete has been applied in mine workings, especially in shafts, to protect timber and steel construction against fire. A notable instance of this is the Cary Mine, for the Odanah Iron Co., (Pickands-Mather Co., Cleveland, Ohio) which has recently fireproofed the steel members of one of its shafts by applying a protective cement-concrete covering by means of an apparatus known as the "Cement-Gun," which is also used largely in shooting cement into rock seams for the purpose of sealing loose rock and for waterproofing surfaces. In the Cary Mine the entire interior of the shaft was covered with wire mash over which a 2-inch coating of "Gunite" was placed.* The steel work was covered with a galvanized wire netting and a ¾-inch coating of "Gunite" then applied. By this process the shaft has been made fireproof.

That such practices should receive increased attention from mine operators and owners is apparent when one realizes that in case of mine accidents the shaft must be of permanent construction so that it may be relied upon. No matter what may happen to the mine the shaft should be safe against the ravages of fire. It is also apparent that the mine shaft should be waterproof because in a dry shaft the deterioration of steel and woodwork, cages, etc., is greatly reduced and the operation of the shaft is not only made considerably safer but more economical.

Cement coatings applied as just suggested should consist of a 1:3 mixture in which the sand is clean, well graded from coarse to fine, and free from organic or other foreign matter such as clay, etc. Full details of the work of the Cary mine are given in an article in the "Engineering and Mining Journal" for February 27, 1915.

Another interesting paper on the use of concrete in mine work will be found in the Proceedings of the Lake Superior Mining Institute, Vol. 18, and refers to the relining of a shaft at the Chapin Mine, Iron Mountain, Michigan.

Of course, concrete has been used in various other ways in underground mine workings. Concrete has been, and is at the present time, used to an increasing extent in building underground dams and bulkheads, and as in above-ground usuages, has given a good account of itself. In most localities where concrete would be practicable all of the necessary materials are near at hand, or may be readily obtained, another reason for giving preference to concrete.

To obtain success with concrete in any construction, careful attention must be given to selecting and proportioning the materials used with the cement. Sand, and gravel or broken stone are commonly referred to as "aggregates," sand being known as "fine aggregate" and gravel or broken stone as "coarse aggregate." Aggregates must be clean coarse, hard and well-graded. Any coating or film of foreign matter covering the particles will effectively prevent good bond of the cement on and between their surfaces. Aggregates must be coarse because the coarser aggregate presents the smaller relative surface for the same volume, and is also more easily covered with cement and makes a stronger concrete with the same proportion of cement.

A prime requisite in proportioning and mixing concrete is that fine and coarse aggregates shall be kept separate and recombined at the time of proportioning each batch, in definite quantities. A 1:2:4 mixture does not mean, nor is not in any way like, a 1:6 mixture in which the 6 parts represent a volume of natural bank-run or pit-run gravel. Bank-run gravel does not occur in the proper proportions of fine or coarse materials and to secure the maximum density, hence strength and watertightness of concrete, mixtures must be so proportioned that voids shall be reduced to the least possible percentage of the total volume.

*Gunite is a mixture of good sharp sand and Portland cement mixed dry, shot by means of the Cement-Gun with an air pressure of about 35 pounds per square inch, the water being added in the nozzle at the moment the mixture emerges. It is fire and waterproof. It can be applied to old mines as well as new and the work can be done with very little interruption of hoisting.

†With Portland Cement Association.

Particles of aggregate which will pass a ¼-inch screen (one having 4 meshes per lineal inch) are considered as sand; coarse aggregate, either screened gravel or crushed stone, shall all be coarser than ¼-inch, and for ordinary work the maximum diameter should not exceed 1½ inches. One sack of Portland cement (94 pounds net) is considered 1 cubic foot, and each batch of concrete should be some multiple of 1 sack. A 1:2:4 mixture, therefore, means 1 sack of Portland cement, 2 cubic feet of sand, and 4 cubic feet of gravel or broken stone; sand and gravel to conform as regards size, grading and cleanliness, to the specifications already given.

Water used in mixing concrete should also be clean and free from organic matter. The amount required depends largely upon the character of the work to be done. Wherever possible, it is desirable to mix concrete to a "quaky" consistency, so that the mass will readily settle into all parts of the forms in which it is being placed, with a minimum amount of puddling or tamping. If too much water is used the cement-sand mortar will separate from the coarse aggregate. Also, if the forms are not watertight, water will flow out and carry a good deal of cement with it, thus robbing the concrete of its most vital constituent.

The following mixtures are recommended for various types of concrete work:

CONCRETE.

A 1:2:3 mixture for:

- One-course concrete walks and pavements.
- One-course floors.
- Roofs.
- Fence posts, mine timbers, and sills, and lintels without mortar surface.
- Water troughs and tanks.

1:2:4 mixture for:

- Reinforced concrete floors, beams and columns.
- Large engine foundations.
- Work exposed to vibration.

1:2½:4 mixture for:

- Building walls and foundations of underground workings.
- Backing of concrete block and similar cement products.

1:2½:5 mixture for:

- Basement walls and foundations of above ground structures.
- Small engine foundations.
- Base of sidewalks and two-course floors.

1:3:5 mixture for:

- Mass concrete footings.

MORTAR.

1-1 mixture for:

- Facing water tanks.

1-1½ mixture for:

- Wearing course of two-course floors.

1-2 mixture for:

- Scratch coat of exterior plaster.
- Facing blocks and similar cement products.
- Wearing course of two-course walks, street and highway pavements.

1-2½ mixture for:

- Finish coat, exterior plaster.
- Fence posts, when coarse aggregate is not used.

1-3 mixture for:

- Concrete blocks when coarse aggregate is not used.
- Cement drain tile, when coarse aggaregate is not used.

Quantities of sand and gravel or stone requird for a one-bag batch or mortar or concrete, and volume of resulting compacted mortar or concrete.

MIXTURES.			MATERIALS.			VOL. IN CU. FT.	
Cem.	Sand	Grav. or Stone	Cem. in Sacks	Sand Cu. Ft.	Grav. or Stone Cu. Ft.	Mortar	Concrete
1	1.5	..	1	1.5	....	1.75	..
1	2	..	1	2.0	..	2.1	..
1	2.5	..	1	2.5	..	2.5	..
1	3	..	1	3.0	..	2.8	..
1	2	3	1	2	3	..	3.9
1	2	4	1	2	4	..	4.5
1	2.5	4	1	2.5	4	..	4.8
1	3	5	1	3	5	..	5.8

Quantities of cement, sand and gravel or stone required for one cubic yard of compacted mortar or concrete.

MIXTURES.			QUANTITIES OF MATERIALS.				
				Sand		Stone or Gravel	
Cem.	Sand	Grav. or Stone	Cem. in Sacks	Cu. Ft.	Cu. Yds.	Cu. Ft.	Cu. Yds.
1	1.5	..	15.5	23.2	.86	..	..
1	2	..	12.8	25.6	.95	..	..
1	2.5	..	11.0	27.5	1.02	..	..
1	3	..	9.6	28.8	1.07	.	..
1	2	3	7.0	14.0	.52	21.0	.78
1	2	4	6.0	12.0	.44	24.0	.89
1	2.5	4	5.6	14.0	.52	22.4	.83
1	3	5	4.6	13.8	.51	23.0	.85

Stone and gravel equal 45 per cent voids (average) 1 sack cement equals 1 cubic ft. 4 sacks equal 1 bbl.

Based on tables in "Concrete, Plain and Reinforced" by Taylor & Thompson.

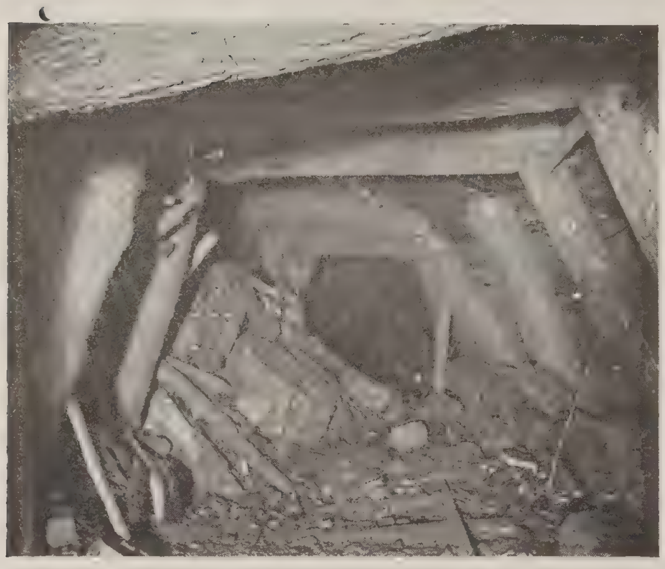
THE BARRETT COMPANY

NEW YORK CHICAGO PHILADELPHIA BOSTON ST. LOUIS CLEVELAND CINCINNATI PITTSBURGH
DETROIT BIRMINGHAM KANSAS CITY MINNEAPOLIS NASHVILLE SALT LAKE CITY SEATTLE PEORIA
THE PATERSON MANUFACTURING COMPANY, Limited: MONTREAL TORONTO WINNIPEG
VANCOUVER ST. JOHN, N. B. HALIFAX, N. S. SYDNEY, N. S.

Barrett
Specification
Roofs

Barrett's
TRADE B MARK
Carbosota
Grade-One Liquid
Creosote Oil

Coal Tar
Products



Mine Timbers Not Creosoted. Note Decay.
(Courtesy U. S. Forest Service.)

Coal mines in general have a high humidity, which causes conditions favorable to the development of wood-destroying organisms and insects. Timbers used for props, collars, caps, legs, etc., shaft timbers and ties decay very rapidly.

Approximately 250,000,000 board feet of sawed timbers and 150,000,000 cubic feet of round timbers are used annually in the coal mines of the United States. The percentage of waste due to decay is greater than in any other industry.

All wood used in mines in permanent locations **should be creosoted.**

The open tank system is the most convenient, economical and very efficient. Where working conditions require only a few years' (3 to 5) increase in the life of timbers the Brush Method of treatment is to be recommended. It is very effective for this purpose and inexpensive.

In some exceptional cases where mechanical conditions necessitate a heavy impregnation of the wood the Pressure Process of treatment is advisable.

Preservative treatment of mine timbers with Barrett's Carbosota-Grade-One Liquid Creosote Oil nearly doubles their natural life.

COMPARATIVE CONDITION OF TREATED AND UNTREATED LOBLOLLY PINE GANGWAY SETS.
Placed in mines by the U. S. Forest Service.

	After 2 yrs. Service			After 3 yrs. Service.		After 4 yrs. Service.	
	Sound	Partly Decayed	Replaced	Sound	Replaced	Sound	Replaced
Untreated ...	5%	10%	85%	none	100%	....	....
Treated *.....	85%	....	15%	82%	18%	75%	25%

*Treated with Coal-tar Creosote Oil by the Open Tank Process (4 to 6 pounds per cu. ft.)
(Bulletin 107 U. S. Forest Service.)

Timbers and lumber used in surface structures, although not exposed to conditions as severe as those found below ground, are also subject to decay and should likewise be given preservative treatment. For such work the Brush Treatment will very often be found most convenient.

The open tank system and Brush Method require an especially refined grade of Creosote Oil, and for this purpose Barrett's Carbosota has been particularly produced. It combines to a maximum degree all the necessary elements.

Barrett's Carbosota-Grade-One Creosote Oil is:—

1—**Toxic**—Poisonous to wood destroying fungi and bacteria.
2—**Penetrating**—Readily absorbed by wood.
3—**Uniform.**
4—**Permanent**—Insoluable and non-volatile.
5—**Convenient to handle and apply.**
6—**Economical.**

Creosoted Mine Timbers.
(Courtesy U. S. Forest Service.)

SAMUEL CABOT, INC.

Manufacturing Chemists

1133 Broadway
NEW YORK, N. Y.

141 MILK STREET, BOSTON, MASS.

24 W. Kinzie Street
CHICAGO, ILL.

Products

Conservo Wood Preservative. Preserves ties, timbers, pilings, planks, bridges, boats, posts, poles, sills, sleepers, etc., from wet and dry rot, insects and worms.

Damp-proofing; Insulating and Deadening Quilt; Creosote Shingle Stains; Waterproof Brick and Cement Stains; Protective Paint for Metal.

Description

Conservo is a compound of high boiling coal-tar distillate, non-volatile, insoluble, non-viscous, and antiseptic. Its tone on wood is rich butternut brown. It may be specified by the following average analysis:

Specific gravitey	1.06 to 1.10	
Flash point (open cup) about	125° C.	
Burning point about	150° C.	
Distilling points	235° C.	about 3%
	235° C. to 300° C.	about 33%
	300° C. to 360° C.	about 41%
Balance in retort, liquid.		
Viscosity (Engler Viscosimiter)	142 sec. at 16° C.	
Viscosity	80 sec. at 35° C.	
Antiseptic Phenols or Tar Acids		7 to 10%
Ash on ignition		.003%

Advantages

Conservo is a scientific product made, not to copy other goods, but to cover the three cardinal principles of pood preservation, i. e.:

(1) Penetrating power—to get into the wood.
(2) Permanence—to stay in the wood.
(3) Sterilizing power—to sterilize the wood.

Penetration

No preservative can preserve the wood unless it penetrates; and Conservo is so limpid that its penetrating power is unique. Its viscosity (viscosity is that "coal molasses" quality that prevents most wood preservatives from penetrating) is only one-fifth to one-half as great as the very heavy preservatives.

Permanence

It not only goes more quickly and deeply into the wood than more viscous prodcts; but, when it gets in, it stays in, because it is insoluble and non-volatile. It will not dissolve out nor evaporate out. Preservatives that cannot penetrate remain on the surface of the wood, and are washed off by the first rains.

Sterilizing

Conservo has always carried the proper percentage—7 to 10 per cent—of Phenols or Tar Acids to sterilize the wood and poison the bacteria that produce decay, although other preservatives have until recently contained only a trace of these. The Phenols also combine with the lignin of the wood and increase the penetrating power, which is of special value for unseasoned wood. It has also been demonstrated that the Phenols in Conservo form permanent asphaltic bases in the wood, that make the preservative results permanent.

Non-Inflammable

Conservo is non-inflammable; and, as it gives off a cooling vapor under flame, it actually makes the wood less inflammable after drying than untreated wood.

Application

Conservo is so limpid, and has such great penetrating power, that it can be effectively applied without heating. At normal temperatures this quality is of great importance where heating arrangements are not feasible; but heat should always be used, if possible, because it increases the limpidity, and helps to expel moisture from the wood.

Conservo can be applied by any method preferred. The most common methods are:

(1) Brush coating, like paint, with a wide flat brush or a mop brush for speed, or with a spraying machine.

(2) Dipping, using tanks of appropriate size for the lumber to be dipped.

(3) Soaking, using tank equipment for either cold or alternate hot and cold soaking, as in the open-tank vacuum method.

Temperature for hot treatment, from about 170° Fahr. for seasoned timber to about 225° Fahr. for unseasoned timber. The length of treatment depends upon the condition and character of the timber, seasoned and porous woods requiring a shorter treatment than unseasoned or dense woods.

Cost

Price of Conservo, 50 cents per gallon in barrels, f. o. b. Boston. The cost of treating depends upon the method selected, the character and condition of the wood, and the economy of handling, which includes wages, waste, etc. The material for two-coat work costs from one-tenth to four-tenths of a cent per square foot, according to the surface.

Covering Capacity

Brush Coating—One gal. covers about 100 sq. ft. of rough sawed lumber, two coats; one gal. covers about 200 sq. ft. of rough hewn lumber, two coats; one gal. covers about 250 sq. ft. of dressed lumber, two coats.

The amount varies somewhat, according to the character and condition of the wood; but these are safe and conservative figures.

Dipping—About the same as brush coating, if the Conservo is drained back into the dipping tank to prevent waste.

Soaking—The covering capacity varies so greatly for both methods of soaking, owing to differences in wood, heating, length of immersion, etc., that it is impossible to give exact figures; but simple soaking for a short time will take about twice as much as dipping; the vacuum process, from four to twelve cubic feet per gallon; and, by the expensive impregnation pressure process, the wood can be made to take up two or three gallons per cubic foot.

C-A-WOOD-PRESERVER CO., INC.

ST. LOUIS, MO.

Branches

New York—56 Liberty St.
New Orleans—C. T. Patterson Co. Ltd.
Cleveland—C. H. Hoyt & Son.
Salt Lake—Dooly Block.
Chicago—Webster Bldg.
Louisville—Starks Bldg.
San Francisco—Rialto Bldg.
Portland—Ainsworth Bldg.
Los Angeles—Marsh-Strong Bldg.
Denver—1550 Glenarm Bldg.
Dallas—Southwestern Life Bldg.
Atlanta—Carter Electric Co.
Havana—Thos. F. Turull.
San Juan—Korber & Co.
Providence—R. J. Weaver & Co.
Boston—H. C. Good, 642 Tremont Bldg.
Pittsburgh—207 Fulton Bldg.

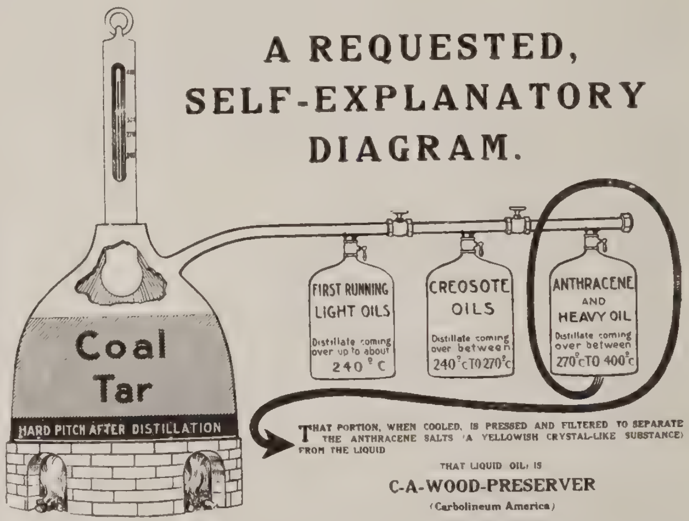
"C-A-Wood-Preserver"
is guaranteed—by affidavit—to contain at least 90% of that liquid coal tar oil distilling above 300°C; in other words, not more than 10% will distil off at 300°C.

By observing the diagram one can READILY see why "light oils" are not used to preserve timber because they would evaporate from timber faster than "Creosote Oil," and likewise shows why "Creosote Oil" always evaporates from the timber faster than "C-A-WOOD-PRESERVER."

Furthermore, the U. S. Forest Products Laboratory tests show 22.2% of Creosote Oil evaporated from treated timber in twelve weeks, while only 3-10ths of 1% of "C-A-WOOD-PRESERVER" was lost in the same time of exposure.

If "Creosote Oil" will evaporate 22.2% in twelve weeks, one can understand why in a few years practically ALL would leave the timber, and is why large amounts must be forced into the timber, by heavy pressure, to obtain satisfactory results.

As "C-A-WOOD-PRESERVER" DOES NOT evaporate to any appreciable extent, it is the logical oil to use for Brush, Dipping and open tank treatment, and it has stood the test for over 25 years.


A REQUESTED, SELF-EXPLANATORY DIAGRAM.
Coal Tar
HARD PITCH AFTER DISTILLATION
FIRST RUNNING LIGHT OILS
Distillate coming over up to about 240°C
CREOSOTE OILS
Distillate coming over between 240°C TO 270°C
ANTHRACENE AND HEAVY OIL
Distillate coming over between 270°C TO 400°C
THAT PORTION, WHEN COOLED, IS PRESSED AND FILTERED TO SEPARATE THE ANTHRACENE SALTS (A YELLOWISH CRYSTAL-LIKE SUBSTANCE) FROM THE LIQUID
THAT LIQUID OIL IS
C-A-WOOD-PRESERVER
(Carbolineum America)

Write any of the above branch offices for the best method and cost estimate for treating your particular timber.

One of the New Wood Tipples in the Bituminous Field Treated with "C-A-Wood-Preserver."

THE NORTHEASTERN COMPANY

LETTENEY
Reg. U. S. Pat. Off.
WOOD
PRESERVATIVE

6 BEACON ST., BOSTON, MASS.

LETTENEY
Reg. U. S. Pat. Off.
WOOD
PRESERVATIVE

2123 L. C. Smith Bldg., Seattle, Wash.
863 Camp St., New Orleans, La.
35 West 32nd St., New York, N. Y.
208 So. LaSalle St., Chicago, Ill.

Letteney Wood Preservative has an unequalled record for brush and open-tank treatment of timber since 1867.

In addition to the positive results in adding years to the life of wood, LETTENEY is a most attractive stain for outside use, giving a rich brown color—strikes well into the wood and does not peel off, producing results quite unobtainable with paint or any other material.

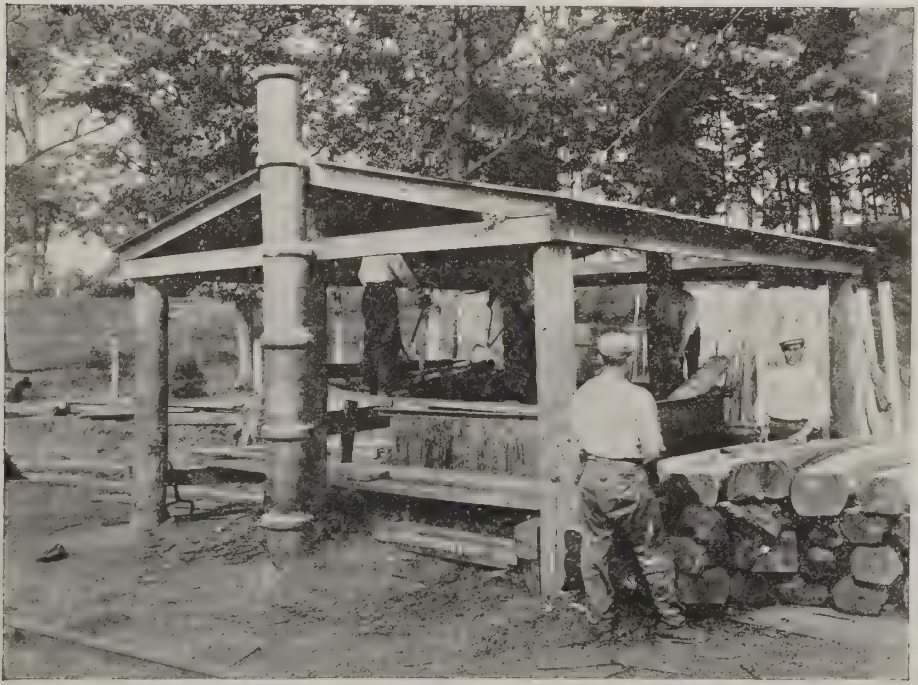
LETTENEY has shown its value in preserving the timbers of such old structures as: Meridian St. Bridge, East Boston, Built 1867; Malden Bridge, Charlestown, Built 1875; Dover Street Bridge, Boston, Built 1876; Chelsea Bridge, Boston, Built 1877.

LETTENEY—Has stood the Service Test of Time since 1867. Will stand the test by analysis.

LETTENEY is applied as a brush coat or by open tank treatment.

For a BRUSH COAT TREATMENT LETTENEY should be thoroughly liquid, and may be applied either hot or cold, according to weather conditions. In very cold weather it should be heated in an iron kettle to between 100° and 150°F. to keep it thin and fluid. The best practice is to apply a second coat after the first has dried in. All season checks, ends of timber, gains, mortices, and cuts of any description should be well slushed. A broad, flat, wirebound brush gives good results.

Coal Handling Plant New York Central and Hudson River R. R., Utica, N. Y. Timber treated with Letteney 1912.



Semiportable Treating Tank Where 500 Ties Per Day Were Given a Five-Minute Dip in Letteney Wood Preservative.

For the OPEN TANK TREATMENT an iron tank, of suitable size to take the lumber, is placed with the top edge about waist high. For heating the preservative in the tank steam coils should be arranged in the bottom, or direct heat used from a fire box under the tank, with the smoke flue carried up three or four feet away, to give the men free access around the tank.

After the tank half full of preservative is heated to from 175° to 210°F. the timber is dipped into it and allowed to remain for five to twenty minutes, depending upon whether it is dry or only partially seasoned. This method is even more economical than the brush treatment when large quantities are to be treated. It also more thoroughly fills the checks, knotholes, and other defects.

CHEESMAN AND ELLIOT

OWNERS NATIONAL PAINT WORKS.
Established 1876
100 William St. NEW YORK

Works
Williamsport, Pa., Brooklyn, N. Y.

Western Penna. Sales Representative
Whiteman & Co., Punxsutawney, Pa.

Products

For over 40 years we have made a specialty of manufacturing paints for the large consuming trade, such as Mining Companies, Railroads, Gas Companies, Bridge Builders, Subway Construction. All of our paints are made to order to suit requirements.

Customers

We mention among our leading clients—Rochester & Pittsburgh Coal & Iron Co., Reading Coal & Iron Co., Lehigh Valley Coal, Davis Coal & Coke Co., American Bridge Co., Pennsylvania Steel Co., Bethlehem Steel Co., New York & Pennsylvania Co., General Chemical Co., International Nickel Co., Anaconda Copper Co., West Va. Pulp & Paper Co., Eastman Kodak Co., General Electric Co., Atlas Portland Cement Co., Lehigh Coal & Navigation Co., Colonial Collieries, American Car & Foundry Co., Tennessee Copper Co., Niagara Falls Power Co., Endicott-Johnson Co., Pennsylvania Railroad, Buffalo Rochester & Pittsburgh Railroad, McClintic Marshall Co., etc.

Protective Paints for Metal

Structural Steel, Sheet Metal, Etc.

For this class of work we recommend the use of a priming coat of our No. 31 Williamsport Red Oxide of Iron Paint followed by a coat of our No. 16 Carbon Black Paint. The coating formed by these paints is very elastic and gives the greatest possible protection to the metal, with the longest durability. Of course, the metal should be clean before the application of paint, and old paint removed except where it is in good condition and firmly attached to the metal. Either of the above paints alone will give good results, but when used in combination the very best results may be expected.

Galvanized Iron

It is a well-known fact that no paint containing untreated linseed oil is suitable for application to galvanized iron, unless the iron has been treated with a special wash, or allowed to weather for months in order to remove the acids and grease which are left on the metal from the galvanizing process. These acids destroy the linseed oil, and cause peeling.

Galvanized Iron should be given a priming coat of our No. 625 Galvanized Iron Primer. This paint is especially prepared for this class of work, and when used under conditions suitable for the application of any good paint, gives a coating that is extremely durable and will not peel off. After No. 625 has been applied any good paint can be used for succeeding coats. No. 625 is furnished in all colors, except pure white, and can be used as a finishing coat also. It is especially recommended for finishing coats on buildings which are subjected to acid fumes injurious to linseed oil paints.

Stacks, Flues, Etc.

Our No. 750 Smoke Stack Black will stand a higher temperature than any other paint, and produce a glossy jet black protective coating of fine appearance. We also furnish graphite stack paint, but recommend No. 750 as even superior (and less expensive) for the large majority of cases.

Wooden Building Paints

Houses, Outbuildings, and other Wooden Structures

Our N. P. W. Prepared Paints are made of highest grade materials in every respect, and manufactured especially for wood. We issue a special color card covering these paints, but match any color desired. These paints are used on residences as well as industrial plants, and other wooden structures.

Brick and Concrete Paints

Paints for waterproofing and beautifying brick and concre structures are manufactured by us with special vehicles suitable for this class of work, and furnished to match any color.

White Interior Paints for Illumination

The use of white paints for coating interior walls, etc., is now generally recognized as an economy by manufacturers, and progressive concerns are realizing the advantage and ultimate economy of using durable, washable oil paints rather than white wash or water paints, which are not permanent and cannot be kept clean and bright.

We recommend highly our No. 57 NaPaWork Flat Inside White, and "Sun-White" Mill Enamel for this class of work. Both of these paints are extremely durable, permanent in whiteness, and can be used on brick, concrete, plaster, wood or metal.

Concrete Floor Paints

These paints are made in all colors, and are effective in their power to penetrate the concrete and prevent the formation of concrete dust. We incorporate a high grade elastic floor varnish in our Concrete Floor Paints which produces a fine finish and withstands wear remarkably well.

Other Paints

Besides the few paints mentioned on this page, we are prepared to furnish at once, in any quantity from one gallon up, any kind of approved paint for any purpose. While we believe in certain pigments and vehicles as being best suited for certain classes of work, our line comprises practically the entire field of protective and decorative paints. We are not prejudiced in favor of any class of pigment or vehicle, except for the results that may be expected from them.

If you will let us know your wants, we will do our best to fill them to your satisfaction.

Tipple and Washery of the Jefferson and Clearfield Coal & Iron Co., Ernest, Pa. Painted with Cheesman & Elliot Paints.

DETROIT GRAPHITE COMPANY

DETROIT, MICH.

Branch Offices

New York, Chicago, Boston, Philadelphia, Cincinnati, Cleveland, Buffalo, St. Louis, Kansas City, Birmingham, Spartanburg, S. C., Springfield, Mass., San Francisco.

Paint and Color Makers

Products

PAINTS, ENAMELS and COATINGS, including SUPERIOR GRAPHITE PAINT; DEGRACO COATING, interior and exterior; STA-WHITE, a white finish for industrial interiors; DEGRACO-TONE, flat finish for interiors; DEGRACO-LITE, for wood or metal trim; DEGRACO PAINT, a protective coating; "ANTI-AQUA DAMP-PROOF COATING; DEGRACO WOOD PRESERVATIVE; DEGRACO CONCRETE FLOOR PAINTS; B. GRAPHITE, for removing scale in boilers, etc.

To properly protect the equipment and surfaces around mines, it is necessary that special paints be furnished to meet the unusual conditions encountered. With this in view, we have carefully studied coal mining conditions, and the paints offered are believed to be the most durable and therefore the most economical that can be purchased.

Structural Steel, Tipples and Breakers

For painting these surfaces "Superior Graphite Paint" No. 30 is recommended. This paint is unaffected by exposure to any atmospheric conditions or gases and dripping of sulphur water from coal. It covers an unusually large surface per gallon and has great durability.

Wooden Tipples

For wooden tipples we recommend a very durable red in Nos. 210 and 313. Other shades are also offered. These paints are made specially for wooden tipples. They cover well, preserve the wood, and, because of their low price and high covering capacity are largely used for this class of equipment.

Smoke Stacks, Boiler Fronts and Hot Surfaces

"Superior Graphite Paint" No. 36 is specially prepared for this work. This paint is made from our Lake Superior graphite ore, which is itself a product of natural heat at over 3000 degrees. It is mixed with pure linseed oil boiled to over 450 degrees. This means that the paint will not burn out and will give real service on hot surfaces.

Machinery

For engines, pumps, hoists, etc., we recommend our machinery enamels. These enamels are of the highest grade, made to withstand heat and oil drippings. They may be washed and cleaned, and will hold their color to an unusual degree.

Galvanized Sheets on Roofs and Sides of Buildings

No. 35 "Superior Graphite Paint" is very largely used for galvanized sheets, and for general use on this surface is a very satisfactory paint. It is economical because of its large covering capacity, is non-fading and durable.

Where other colors are desired we recommend our Nos, 30, 308, 55, and 57.

For the painting of newly galvanized sheets, our Galvanized Iron Primer should be used before the finish coat is applied.

Fan Houses

No. 30 "Superior Graphite Paint" will give the utmost protection.

Steel Mine Cars

We recommend for this work our No. 106. This is a special water-proof and moisture-proof paint. It is unaffected by sulphur water or any impurities found in the coal. Experience has shown that one coat of No. 106 on a mine car every year or every eighteen months will more than double its life. This paint covers well and dries quickly and hard.

Mine Piping

No. 106, referred to above, is equally as serviceable on piping as on steel cars.

Miners' Houses

We have made a specialty of Cottage colors in a large variety of shades for miners' houses. These paints are especially made so that they will not change color or fade when exposed to smoke or gases around a mine. They are made to meet mining conditions and will give maximum service. They are very durable and have a large covering capacity.

For the interior woodwork we also make special paints which are being used with excellent results in the coal mining field.

Mine Timbers

For the painting of mine timbers, trestles, flooring, wooden poles below ground level, etc., we recommend Degraco Wood Preservative. This is a material of good penetration, and consequently of good preserving qualities. Its use on timbers exposed to moisture or dampness will more than double the life of the wood. It is easily applied, covers well and is sold at an attractive price.

No. 22-B Boiler Graphite

No. 22-B Boiler Graphite is an amorphous form of graphite, ground to an impalpable fineness. It mixes readily with water, and has a natural affinity for steel.

Scale is readily removed from a boiler, and its formation effectively prevented by the use of No. 22-B Boiler Graphite.

The above products cover only a small portion of the specialties manufactured by this Company. We shall be glad to give color cards and booklets, and detailed information on them or on any other paints required.

THE NATIONAL ROOFING CO.

Factories and General Offices
166 Filmore Ave., Tonawanda, N. Y.

District Sales Offices

Baltimore, Md., 546 Monument St., East.
Binghamton, N. Y.......91 State Street
Buffalo, N. Y..............51 Broadway
Cleveland, Ohio....6318 Kinsman Road
Des Moines..........3rd & Market Sts.
Detroit, Mich........395 Michigan Ave.
Louisville, Ky..........314 W. Main St.
Milwaukee, Wis.............219 8th St.
New Orleans, La........715 Perdido St.
Philadelphia, Pa.....33rd & Master Sts.
Pittsburgh, Pa....607 Publication Bldg.
Providence, R. I...........830 Eddy St.
Syracuse, N. Y......569 So. Clinton St.

Manufacturers of

Asphalt Roofing High Grade Paints

Roofing Products.

PREPARED ASPHALT ROOFINGS surfaced with Gravel, Crushed Red and Green Slate, and Fine Feldspar Rock, including SECURITY WIDE-WELD, SPARKLOID AND NATROCO ASPHALT ROOFING; NATROCO ASPHALT SHINGLES.

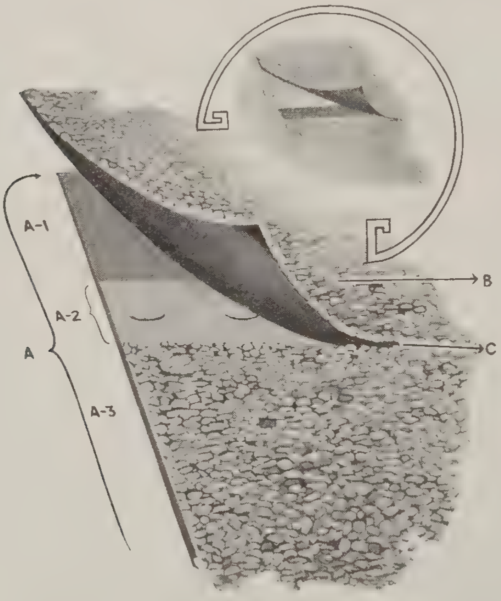
Also, TRIUMPH, JEFFERSON and CHAMPION RUBBER ROOFING; NATIONAL ASPHALT FELT; "FIXIT;" MINERAL ASPHALT and NATIONAL LIQUID ASPHALT CEMENTS; NATIONAL and UNION ROOFING CEMENTS.

NATROCO WALL BOARD.

For special Paints and Roof Coatings see our name in General Index.

Security Wide-Weld Asphalt Roofing.

Security Wide-Weld Roofing is made with a patented 6-inch joint that cannot leak, welds the whole roof into one continuous piece and covers all nail heads with the full thickness of the roofing. Each sheet is lapped over the 6-inch ungraveled margin of the sheet below and welded to it with hard asphalt cement.



6-Inch Cement Weld.

Our Roofings are approved by the National Board of Fire Underwriters.

HOW THE CEMENT WELD IS MADE—In the illustration above the indication of the lettering is as follows:

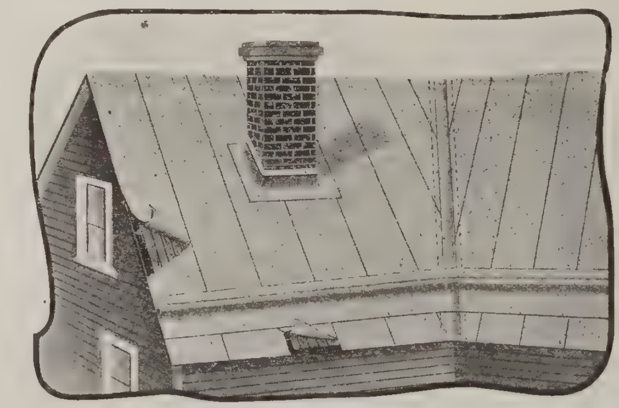
A—Upper portion of sheet of Security Roofing lying on the roof.

B—Lower portion of sheet lying next above on the roof, turned back to show ungraveled margin of sheet "A".

A-1—Bottom layer of lower sheet of asphalt-saturated felt, 36 inches wide, extending four inches beyond other layers, and along the upper edge or margin of the entire sheet or roll of roofing.

A-2—Full thickness of two layers of felt and two of natural mineral asphalt, 32 inches wide, extending two inches beyond the surfacing, and covered with tissue-paper tape to prevent sticking in the roll. The nails are driven through this full thickness of the roofing as shown in the illustration.

A-3—Gravel-surfaced portion of sheet "A", 30 inches wide, composed of two layers of asphalt-saturated felt, two of mineral asphalt, one of white sea gravel (red or green slate or fine feldspar if preferred).



In applying, the roofing "A-1" and "A-2" are covered with a thick layer of hard asphalt cement (hot) and "B" is then brought down over the entire six inches and welded firmly to it. Thus you have one unbroken sheet of gravel-surfaced roofing covering all nail-heads and making a continuous one-piece roof without a nail hole in it.

NO COAL TAR—Security Roofing is made of special high-grade, long fibered wool-felt, saturated with natural mineral asphalt, which we refine by our own formula, the result of over twenty-five years' experience. Not a particle of coal-tar or pitch in any form, enters into the composition of any of our roofings.

SURFACING—The surfacing of Security Roofing is a heavy layer of natural mineral asphalt cement, in which is permanently imbedded a fine layer of white sea gravel, crushed slate or crushed feldspar rock. This adds to the durability, weatherproofing and fire-resisting qualities, and obviates all need of painting and repairs. It can, however, be changed in color by using our "Asphaltus" Coating.

FOUR STYLES—Security Roofing is made in four styles: Gravel Surface, Red Slate, Green Slate and Fine Feldspar. It can also be furnished with burlap insertion for siding or roofs of one-half pitch. Security Roofing is satisfactory for all classes of roofs, and easily applied by any intelligent workman. Copy of specifications furnished upon request.

Natroco Asphalt Shingles.

Natroco Asphalt Shingles are made from the same high-grade materials as our roofings, surfaced with crushed red and green slate or gray rock. They are fire-resisting, durable and sightly for residences, public buildings and similar structures.

They are cut 8 inches wide by 12¾ inches long, to be laid about ½ inch apart and 4 inches to the weather; 424 shingles cover 100 square feet. Shipped in cartons, each containing one quarter square of 106 shingles.

Other Brands.

Sparkloid Asphalt Roofing is made in three weights, surfaced with crushed feldspar, finished on lower side with protective layer of flake mica; fire, acid, gas and steam proof from the bottom as well as the top. Natroco Roofing is made in four styles, surfaced with red and green slate and fine feldspar rock, having a three-inch instead of the customary two-inch. Descriptive booklets pertaining to all brands of Roofing sent upon request.

PAINT PRODUCTS

Ready Mixed Paints:—"Natroco" "Corporation", "Egyptian" "Natroco Interior Hard Drying Floor Paint"; "Natroco Porch Floor & Deck Paint"; "Natroco (Washable) Flat Wall Finish"; "National Creosote Shingle Stain."

Cement Paints:—"Phlorkote"; "Stuckote."

Waterproofings:—"Hydrolox"; "Retaw Proofing"; "National Bondkote"; "Minrubite Proofing."

Heat Resisting Paints:—"Protec Stac"; "Hytest."

Structural Iron Paints:—"N. R. C. Protective Paint;" "National Double X Graphite"; "Black Knight Paint."

Roof Coationgs:—"Toka"; "Asphaltus";" National Asbestos Fibrekote".

Interior Factory Paints:—"Factrolite"; "Kalsolite."

Varnishes:—"Luxall"; "Natroco Floor Varnish"; "Natroco Interior Varnish"; "Natroco Exterior Spar Varnish"; "National Asphalt Varnish."

"Natroco Ready-Mixed Paint."

A high-grade paint for use upon exterior or interior of residences, buildings, etc. Prepared from white lead, zinc oxide, pure linseed oil and turpentine japan dryer. Made in thirty-five attractive and durable colors.

"Natroco (Washable) Flat Wall Finish".

A durable and artistic mode of wall covering to be used for interior decoration. The soft tones of "Natroco Flat Wall Finish" are restful to the eyes, and harmonize with any scheme of decoration. An oil paint prepared from a specially treated linseed oil and non-poisonous pigments free from lead. Made in eighteen colors.

"Corporation Ready-Mixed Paint."

A medium priced paint of dependable quality. Prepared from sublimed white lead, zinc oxide, indestructible finely ground asbestos and a specially prepared linseed oil vehicle. Adapted for all general painting work such as residences, buildings, marine work, etc. Made in twenty-seven durable colors.

"Egyptian Ready-Mixed Paint."

A low-priced, satisfactory paint for general rough work such as the painting of cottages, barns, structural iron, metal roofs, etc. This paint is extremely resistant to the action of sulphurous gases and will outlast strictly pure linseed oil paint where subjected to the action of chemical fumes. Made in seven durable colors.

"Asphaltus Roof Coating."

For renewing, preserving and beautifying felt, rubber and other composition roofing. Made from pure natural mineral asphalt, which reinforces and protects the weather surface. "Asphaltus" is in a class by itself. Made in colors: Black, Red, Green, Brown and Terra Cotta.

"National Asbestos Fibrekote."

A combination of asphalt and asbestos fibre reduced to a consistency that will permit of application with an ordinary three knot roof brush. For use upon metal, concrete or composition roofing, etc. Especially adapted for use upon badly rusted iron roofs; fills up the holes and prevents further deterioration. Highly resistant to the action of chemical fumes. Made in Black only.

"Protec Stac."

Made expressly for the protection of heated metal surfaces such as smokestacks, boiler fronts, steam jacketed kettles, etc. Highly resistant to the action of acids and alkalies. Produced only from high melting mineral asphalts and contains no coal tar. Made in Black only.

"Black Knight (Acid Proof) Paint."

An economical "fool proof" black paint requiring no stirring or reduction before use. Adheres perfectly to galvanized iron. Can be used for painting of structural iron surfaces for the protection of same against the action of chemical fumes. Highly recommended for use upon metal roofs.

"Kalsolite."

A cold water paint in powder form. The addition of cold or warm water will prepare it for immediate use. Produces a flat white, marble-like surface that will not flake or rub off. It is fire-retarding and will not burn when subjected to direct flame. Recommended for use upon the interiors of mills, factories, stables, dairies, etc.

Special Notice:—

Descriptive literature and color cards relative to products mentioned herein will be mailed upon request. We solicit correspondence upon special paint products.

ASBESTOS PROTECTED METAL CO.

First National Bank Building
PITTSBURGH, PA.

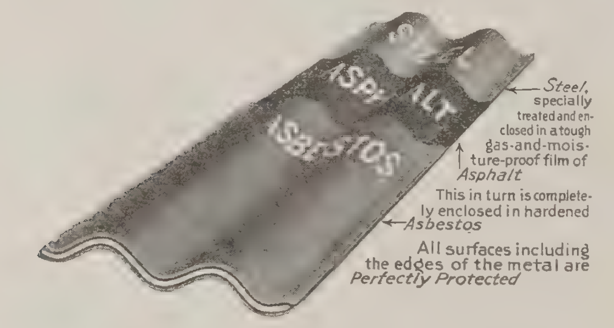
Branch Offices:

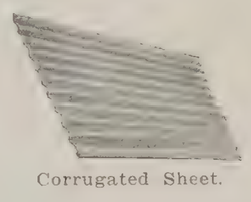
Atlanta, Ga.
Baltimore, Md.
Boston, Mass.
Buffalo, N. Y.
Chicago, Ill.
Cincinnati, Ohio
Cleveland, Ohio
Dallas, Texas
Denver, Colo.
Detroit, Mich.
Easton, Pa.
El Paso, Tex.
Indianapolis, Ind.
Kansas City, Mo.
Milwaukee, Wis.
Minneapolis, Minn.
New Orleans, La.
New York, N. Y.
Omaha, Neb.
Philadelphia, Pa.
Portland, Ore.
St. Louis, Mo.
Salt Lake City, Utah
San Francisco, Cal.
Scranton, Pa.
Seattle, Wash.
Montreal, P. Q., Can.
San Juan, Porto Rico
Wilmington, Del.

Asbestos Protected Metal

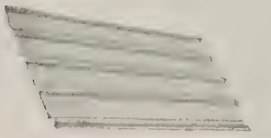
Asbestos Protected Metal

The core of Asbestos Protected Metal is of open-hearth steel sheets, which are coated on each side and over all edges with a prepared asphalt compound. The asphalt is protected by layers of pure long-fibre asbestos felt, specially hardened and waterproofed, applied while the asphalt is hot. The asphalt provides permanent protection to the metal against corrosive influences of moisture and fumes, and the asbestos protects the asphalt from mechanical abrasion, and prevents evaporation and carbonization of the natural life-preserving asphaltic oils.


STEEL
ASPHALT
ASBESTOS
Steel, specially treated and enclosed in a tough gas-and-moisture-proof film of Asphalt
This in turn is completely enclosed in hardened Asbestos
All surfaces including the edges of the metal are Perfectly Protected



Corrugated Sheet.



Mansard Beaded Sheet.

While asphalt is impervious to moisture and corrosive fumes, it will deteriorate under the influences of sunlight and heat. The asbestos is opaque, and has high heat insulating properties. It entirely protects the asphalt from its most active enemies. Asbestos is absolutely inert, and cannot rot or decay. Moreover, it is unaffected by the elements.

Asbestos Protected Metal is as easily applied as any metal sheet, and will last indefinitely without paint. The sheets are made in three colors: Asbestowhite, two shades of Gray and Terra Cotta, and in various forms such as corrugated sheets, beaded sheets, clapboard siding, flat sheets, ridge caps, flashings and trim, louvers, etc.

Clapboard Siding.

Asbestos Protected Metal Ridge Cap.

Registered Trade Mark.

Prominent coal operators, railroads, oil companies, public service corporations, chemical works and steel makers have standardized it as the roofing and siding of all metal covered buildings. It is used in large quantities to cover mills, smelters, fertilizer factories, gas plants, car barns, chemical storage warehouses and glass works; also, as a covering for runways, galleries, viaducts, etc.

Some users of Asbestos Protected Metal in the Coal Field:

Jamison Coal & Coke Co.	Pittsburgh, Pa.
Keystone Coal & Coke Co.	Greensburg, Pa.
Atlas Coal Company	Pittsburgh, Pa.
Lehigh Coal & Navigation Co.	Philadelphia, Pa.
Berwind-White Coal Mining Co.	Philadelphia, Pa.
Raleigh Coal & Coke Co.	Raleigh, W. Va.
Peabody Coal Company	Chicago, Ill.
Virginia Iron, Coal & Coke Co.	Roanoke, Va.

A typical A P M installation, Keystone Coal & Coke Co.
Greensburg, Pa.

There is only one Asbestos Protected Metal. Its record of performance under the severest exposure is its recommendation.

General Roofing Manufacturing Company

Sales Offices:

PITTSBURGH **ST. LOUIS** **CINCINNATI** **PHILADELPHIA** **CHICAGO** **KANSAS CITY** **ATLANTA**
NEW YORK CITY CLEVELAND SAN FRANCISCO NEW ORLEANS SEATTLE RICHMOND LONDON
BOSTON DETROIT LOS ANGELES MINNEAPOLIS INDIANAPOLIS HOUSTON SYDNEY

Mills:

E. ST. LOUIS, ILL. MARSEILLES, ILL. YORK, PA. RICHMOND, CAL.

World's Largest Manufacturers of Roofings

Roofings, Out-Door Paints, Wall Boards and Building Papers

Products

Trade Mark.

CERTAIN-TEED Roofing; Burlap Reinforced Mica Surfaced Roofing; Asbestos Surfaced Roofing; Slate Surfaced Roofing; Slate Surfaced Asphalt Shingles; Wall Boards; Insulating Papers; Out-Door Paints; Shingle Stains; Metal Paints; Plastic Cement, etc.

Certain-teed Roofing

This is an Asphalt Roofing made in three thicknesses and guaranteed 5, 10, or 15 years according to ply. It can be used effectively and economically on miners' houses, power plants, tipples, coal washeries, fan houses, oil houses, commissary stores, stables, and buildings of every type, large or small; also for lining chutes. CERTAIN-TEED Roofing is put up in rolls 32″ wide sufficient to cover 100 sq. ft. of roof surface. Nails, cement and full directions for laying are placed in the core of each roll.

Certain-teed Slate Surfaced Asphalt Shingles

These high-grade Shingles are made of the same materials as are used in the manufacture of CERTAIN-TEED Roofing. The asphalt body is heavily surfaced with genuine crushed slate in natural red or green colors. As the coloring is natural, and therefore cannot fade, no painting is necessary at any time. CERTAIN-TEED Shingles cannot rot, crack, or warp and they will last much longer in any climate than the average wood shingle. They are guaranteed for a period of 10 years. Not only are these shingles the most durable on the market, but they are greatly superior to wood shingles in their fire resisting qualities. They are laid the same as ordinary wood shingles and when laid they form a treble thickness. They are put up four cartons to a square, sufficient to cover 100 sq. ft. of roof surface. There are 424 shingles to a square and each shingle is 8″ x 12¾″. Total weight about 230 lbs.

Certain-teed Slate Surfaced Roofing

This roofing is composed of the same materials as are used in the shingle form, and it is guaranteed for 10 years. It is not affected by acids, gases and vapors of any kind and it does not expand or contract with extreme heat or cold. It is put up in rolls 32″ wide suffcient to cover 100 sq. ft. of roof surface. Nails, cement and full directions for laying are enclosed in each roll. Weight about 80 lbs. per quare.

Certain-teed Board

This Wall Board is one of the strongest on the market and it has a maximum resistance to the absorption of moisture. It is made by cementing together four sheets of wood fibre material and is finished in an attractive pebbled surface.

As an improvement over lath and plaster, CERTAIN-TEED Board has no equal. It can be used for interior finishing of miners' houses, for partitioning of booths or offices in factories, power plants and commissaries. It is also recommended for finishing attics, or garrets, and basements in expensive residences.

CERTAIN-TEED Board is a non-conductor of heat and saves fuel in cold weather and keeps the building cooler in hot weather. It is clean, sanitary, and absolutely vermin proof. It cannot dust, crack or crumble like plaster.

CERTAIN-TEED Board is made in widths of 32″ and 48″ and in lengths of 6, 7, 8, 9, 10, 14, and 16 ft., weighing about 575 lbs. per 1000 ft. There are 10 sheets to a bundle.

Certain-teed Out-Door Paints

These paints are especially manufactured for use in painting miners' houses, tipples, fences, bridges, factories, warehouses and metal surfaces of all kinds and they are furnished in Oxide Red, Moss Green and Bronze Green. The materials used in the manufacture of these paints are selected with the greatest care and the process of mixing and grinding is such that the pigments and liquids are thoroughly mixed and combined. They are furnished in bbls., half bbls., 5 gallon cans and in crates of 6—1 gallon cans.

Certain-teed Metal Paint

A quick-drying, bright, black paint, for general use on metal surfaces, tipples, cages, mining machinery, hand rails, stacks, etc.

Certain-teed Roof Coating

A durable, permanent and weather-proof coating, for use on Asphalt Composition (so-called "rubber") roofs. It thoroughly penetrates into the body of the roofing, renewing the life of the asphalt saturation used in its manufacture.

Certain-teed Plastic Cement

Is recommended for patching composition or metal roofs; also, as a substitute for putty for out-door work, particularly in placing glass in skylights of tipples, etc.

Certain-teed Creosote Wood Preservative

Is intended for use on out-door underground woodwork. Can be applied by brushing or dipping. It is a thorough preservative against dry rot or other decay.

H. W. JOHNS-MANVILLE CO.

BRANCH OFFICES:

Akron
Albany
Atlanta
Baltimore
Birmingham
Boston
Buffalo
Chicago
Cincinnati
Cleveland
Columbus
Dallas
Dayton
Denver
Detroit
Duluth
El Paso
Galveston
Havana
Houghton
Houston
Indianapolis
Kansas City
Los Angeles
Louisville
Memphis
Milwaukee
Minneapolis
Nashville
Newark
New Orleans
New York
Omaha
Philadelphia
Pittsburgh
Portland
Rochester
St. Louis
St. Paul
Sacramento
Salt Lake City
San Diego
San Francisco
Seattle
Syracuse
Toledo
Tulsa
Washington
Wilkes-Barre
Youngstown

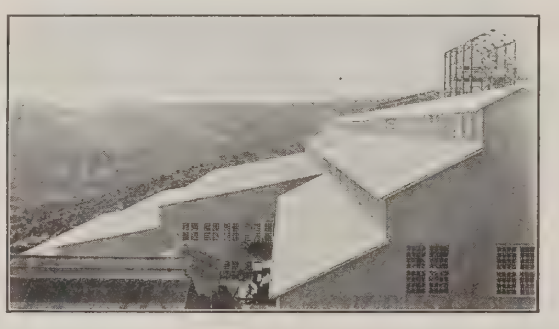
The Canadian H. W. Johns-Manville Co., Toronto, Montreal, Vancouver, Winnipeg.

Johns-Manville Service to Mines

It is by combining the mining engineer's intimate knowledge of his plant conditions with our own representative's knowledge of J-M Products that we can serve most efficiently. Mining companies that use Johns-Manville Service find it a real help. If you haven't used it, get in touch with our nearest branch.

J-M Asbestos Ready Roofing

This roofing offers excellent protection against fire and is immune to the action of gases and ordinary acid fumes. As it contains nothing to deteriorate, it never requires painting, coating or graveling, hence it puts an end to roof repair and expense.



Miami Copper Company, Miami, Arizona.
H. Kenyon Burch, Consulting Engineer.

Note the clean, white appearance of J-M Asbestos Roofing. This is from an unretouched photograph.

J-M Asbestos Roofing has been in service on many buildings for 25 to 30 years without costing a cent for repairs. It is the cheapest of all roofings from the cost-per-year standpoint.

Made by crushing solid asbestos rock and compressing the long fibres into a dense felt. Several layers of this rock felt are then permanently cemented together with a compound of Trinidad Lake and other asphalts, forming a light weight, all mineral roof covering, in rolls ready to lay. Asbestos gives an attractive white finish. No unsightly smears. J-M Roofing Fasteners eliminate cement. We also manufacture J-M REGAL ROOFING, the most durable of all "rubber" type roofings. Made by saturating a high-grade wool felt with the same waterproofing compound used in J-M Asbestos Roofing.

J-M Corrugated Asbestos Roofing

A practically indestructible roofing made by applying alternate layers of Asbestos felt (the same material used in J-M Asbestos Ready Roofing) and asphalt compound to both sides of heavy sheet metal. The metal is then corrugated. Cheaper than corrugated iron because it never needs painting and lasts longer.

J-M Asbestos Roofings are examined and approved by the Underwriter's Laboratories under the direction of the National Board of Fire Underwriters.

J-M High Temperature Cements

make firebrick and boiler settings last longer. They reduce maintenance costs. Outlast fire clay many times, resist temperatures up to 3100 deg. F.

J-M Asbesto-Metallic Brake Blocks

If you are interested in a material for your brakes and clutches that will operate for months without appreciable wear, if you can use a brake block that will not even char under great frictional heat and that is unaffected by water, climate, oil or grease, then try J-M Asbesto-Metallic Brake Blocks.—**For structural reasons.** If you need accurate braking, a brake that will respond to the slightest pressure or the "hardest jam" without feeling the shock, try J-M Asbesto-Metallic Brake Blocks.—**For Operating Reasons.** If you want your brake to be a "safety" brake, that will not slip or creep, even in the presence of oil, grease or water try J-M Asbesto-Metallic Brake Blocks.—**For safety reasons.**

J-M Asbesto-Sponge Felted Pipe Covering

Most efficient of all pipe insulations. Saves 75% of the fuel lost by radiation through ordinary coverings. Made of pure Asbestos fibre and finely ground sponge, built up in laminated form. Each layer contains **millions** of dead air cells—the most efficient form of insulation. Extremely tough but flexible. Withstands vibration and hard usage. Never crumbles and loses its insulating value. Not affected by moisture.

J-M Asbestocel Pipe Covering

A recent improvement on the ordinary air cell type of pipe covering. Composed of heavy asbestos felt and built so that the channels run around the pipe instead of lengthwise. This construction confines the dead air in small spaces, preventing it from circulating and giving the covering high insulating efficiency. Strong and durable. Not injured by vibration, rough usage or long shipments. For medium and low pressure steam and heating pipes. Made in thicknesses of ½-inch to 3 inches.

J-M Seigelite Sheet Packing

Is highly efficient in oil, grease, gasoline, hot and cold water and air service.

J-M Electrical Supplies

"Noark" Enclosed Fuses; Fuse, Service and Subway Boxes; Service Meter Protective Devices.

J-M Friction Tapes.

"Moulded Mica"—J-M Bakelite—Electrobestos and Vulcabeston Insulation.

J-M Fibre Conduit.

J-M Niagrite Fireproof Cable Insulation.

J-M Ebony Asbestos Wood.

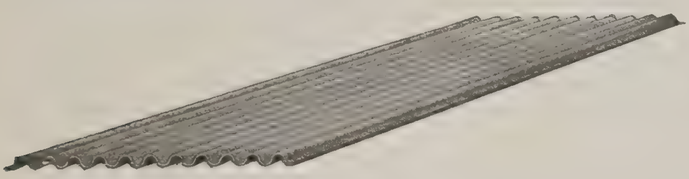
Write for booklets.

KEASBEY & MATTISON COMPANY

AMBLER, PENNA.

BRANCH OFFICES IN THE LARGER CITIES

Asbestos Corrugated Sheathing



Used for roofing or siding elevators, rolling mills, train sheds, warehouses, breakers, tipples, or any kind of building where a PERMANENT roof is desired.

Will not rust or decay. Indestructible. Never requires paint.

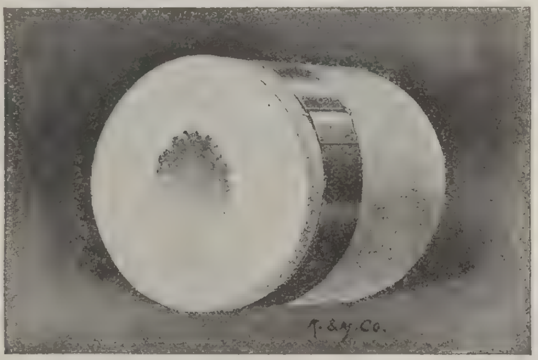
Made in sheets 27½" wide—in lengths from 4 to 10 feet, inclusive.

Applied directly on wood or steel purlins.

Composed of Portland Cement and Asbestos Fibre, mixed in the presence of a large volume of water and subjected to tremendous hydraulic pressure, this material, like all other concrete products, IMPROVES with age.

It is comparatively light in weight, from 2.8 to 3 lbs. to the square foot, and as a substitute for galvanized iron roofing or siding is unequalled.

85% Magnesia Covering



We are the original manufacturers of 85% Magnesia Pipe Coverings—the standard insulation for over 35 years—used by practically all the largest steam users in the country.

Furnished in 3-foot sections from 1" to 3" thick, to fit standard pipes ½" to 10" in diameter. For larger surfaces we supply curved segments or blocks, tape, canvas and clips.

Sectional Covering finished with a canvas jacket and metal bands. Ells, tees, valves, etc., to match.

Can also supply other pipe and boiler coverings, suitable for all requirements.

Also Asbestos and Magnesia Cements.

K. & M. Wire Inserted Sheet Packing

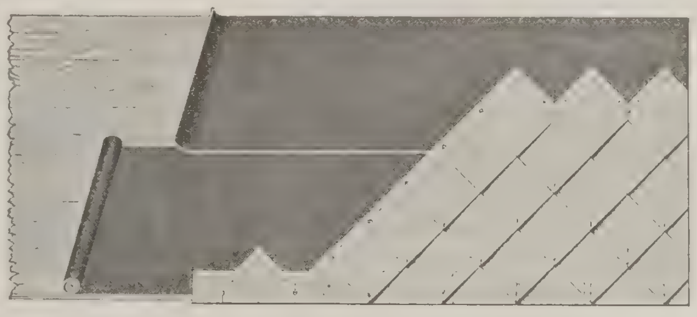
Made from pure asbestos fibre interwoven with brass wire and specially treated.

A high grade packing and suitable for many requirements.

Artificial Roofing Slates
(Asbestos "Century" Shingles)

THE EVERLASTING ROOF. This material, like the Asbestos Corrugated Sheathing, is composed of Portland Cement and Asbestos Fibre, combined in practically the same manner, but made in flat sheets from which the shingle shapes are cut.

Owing to its concrete nature, it improves instead of deteriorating with age, and roofs applied when the material was first manufactured (about nineteen years ago) are as good today as when first put on. Various tests made on this material, by both public and private testing laboratories, tend to show that it is practically everlasting.



French or Diagonal Method of Application
Showing Starting Courses at the Eaves.

These shingles have been used in the United States for about nine years, and during that time approximately 50,000 different buildings have been covered with them.

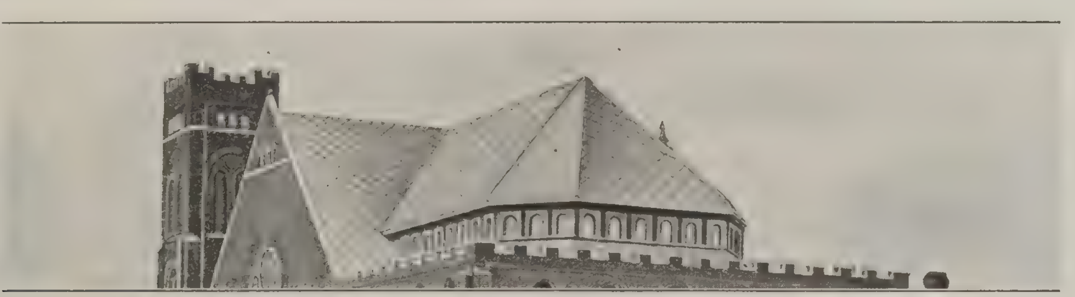
When applied according to the French Method, illustrated above, they weigh about the same as wooden shingles per square, and very much less than natural slate.

Asbestos "Century" Shingles are admirably adapted for siding, as they do not require paint and the upkeep expense of a building thus treated is therefore reduced to a minimum.

Carried in three colors—Newport Grey, Indian Red and Blue-black.

Also

Asbestos Papers and Millboards.
Asbestos Cloth Packings of all kinds.
Asbestos Brake Lining.
Asbestos Gaskets of all kinds.
Asbestos Wick and Rope.
Asbestos Twine, Thread and Cord.
Asbestos Cloth of all kinds.
Asbestos Roofings.
Asbestos Furnace Cements.
Etc., Etc., Etc.



IF IT'S MADE OF ASBESTOS WE'VE GOT IT.

North American Construction Company

General Offices
BAY CITY, MICHIGAN

Mills and Distributing Points in Michigan, Florida, Louisiana, Oregon

What An Aladdin House Is

Aladdin Houses or the Aladdin Readi-Cut System of construction are by no means new or impracticable. This method of erecting houses has been in successful operation for the past ten years. An Aladdin house is identical in construction, design and sizes of material to the very highest type of frame construction erected anywhere. The method only differs—method of preparing the materials. Every piece of material is cut to fit by machinery in the mill, marked and numbered, ready for erection and nailing in place when it reaches the job. This permits standardization of parts, elimination of the usual 18% waste and the substitution of machine for hand labor. As regularly listed and priced in our catalog, an Aladdin house includes all lumber, millwork, hardware, plaster, paints, nails, etc., above the foundation.

What Aladdin Service Is

Aladdin Service is all inclusive. Every factor necessary to the working out of housing problems from a survey of a new city, laying out the streets, sewers, public improvements, landscape architecture, organizing and managing the construction, furnishing all material, completing of the last item to turning over the finished product, or any part of this service is available.

Heating, lighting, plumbing, individual water systems, sewerage disposal, including complete furnishing of homes in every part are competently handled from our own stocks of goods.

A Complete City in Sixty Days

The Aladdin organization was called upon to build a city in sixty days. Most urgent was the necessity for quick action. A large industrial project demanded a new city—complete—to be created in a practical wilderness, at the source of its raw material. Aladdin was called in, took the job, and **finished it fifteen days ahead of schedule.** Hopewell, Virginia, stands as a monument to Aladdin's almost unlimited capacity. This service meets any requirements where rapid construction is demanded. Whether the necessity is for a single house or building, or for one thousand, this organization is just as interested and just as capable of serving satisfactorily.

Quick, Economical Erection

To ship the complete material in a single car for one, two or three houses, and to have it all on the ground at one time is a tremendous advantage. It eliminates all delay incident to purchase of the many items entering the construction. It insures quantity prices on every item from the joists to the varnish. It evades the executive time-wasting of following up slow deliveries, checking deliveries, prices and quantities from many different sources and it insures the quickest possible consummation of the entire project. Back of each shipment is our qualified agreement of **sufficient material for the completion of each house.**

All exposed lumber, both inside and outside of each Aladdin house, is absolutely clear. This holds good whether the lumber is to be covered with paint or not. Clear siding, porch work, outside finish, mill work, flooring and interior finish are invariably furnished. Pure white lead and pure linseed oil, the best gypsum plaster, clear shingles, building paper of high grade, brush brass hardware, etc.

A standard 5-room shingled Aladdin cottage. Three years' rent at $11 per month will pay for this house plus 5% on the investment.

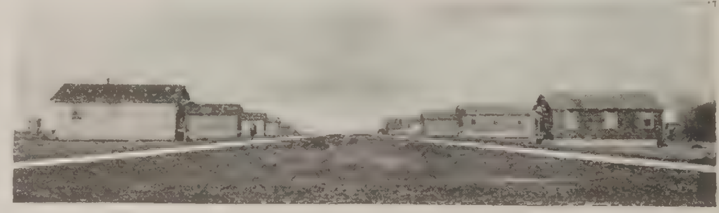
Standardization of Parts and Substitution of Machine for Hand Labor are the Two Basic Principles of the Aladdin System of Construction.

These principles have been successfully operating for over ten years in building the Aladdin business. Over 50,000 people are now occupying Aladdin houses in the United States, England, France, Alaska, many parts of Central and South America, and South Africa.

How can we put this splendid system and this splendid organization **in your service?**

A few words from you explaining your housing necessities will permit us to get in action, and, without obligation, lay before you, suggestions, plans and prices. Will you give us this opportunity?

When writing please address Industrial Housing Department.



A group of Aladdin Houses recently erected for Bell & Zoller Mining Company, at Ziegler, Illinois.

Standard Aladdin Designs and Special Designs From Standard Materials Have Been Furnished for All of the Following Types of Buildings:

Houses, one and two story, all sizes and prices.

Barns; Garages; Dormitories; Guard Houses; Dining Halls; Bath Houses; Hotels; Office Buildings; Commissaries; Store Buildings; Schools; Churches; Railway Stations Section Houses; Flag Stations; Dance Halls and Pavilions; Public Rest Rooms.

A group of Aladdin Houses recently erected for the Dupont Powder Company. Over 300 Aladdin Houses were erected by this company in a period of six months.

Model Miner's Cottage.

Model Miner's Cottage At Panama Pacific Exposition

The North American Construction Co., has been honored the past two or three years in different ways, but is most proud of the medals awarded by two great expositions. The Panama-Pacific International Exposition, that most wonderful of all great World's Fairs, and the Michigan Agricultural Exposition granted "Les Grandes Prix." The Panama-Pacific Medal was issued upon the Model Cottage which Aladdin produced and erected for Uncle Sam, while the Michigan Exposition Medal was the result of our building a Kentucky bungalow at the fair for the Northeastern Michigan Development Bureau. Copies of the plans of the model miner's cottage erected at the Panama-Pacific Exposition are on file and available to those interested.

Highest Award.

LEHIGH PORTLAND CEMENT CO.

Main Office

ALLENTOWN, PA.

Main Western Office
Chicago, Ill.

Pacific Coast Office
Spokane, Wn.

Branch Offices

New York Boston Philadelphia Buffalo Jacksonville Pittsburg
New Castle, Pa. Mason City, Ia. Minneapolis

Mills at

Ormrod, Fogelsville, West Coplay and New Castle, Pa.; Mitchell, Ind.; Mason City, Iowa; Metaline Falls, Wn.

Products and Services

Lehigh Cement—guaranteed to conform in every respect to present Standard Specifications for Portland Cement as adopted by the American Society for Testing Materials when tested by methods of testing recommended by the American Society of Civil Engineers.

For those customers desiring to test their own cement, we will reserve and seal bins for any amount desired.

Marketing and Shipping Facilities

Lehigh Mills are located at strategic points from the Atlantic to the Pacific. In all the principal marketing centers, branch offices have been established for the convenience of our customers.

Lehigh Cement is marketed in cloth or paper bags for domestic trade, and in barrels for export trade. The bags contain 94 pounds net (four bags to the barrel), and the export barrel contains 376 pounds net. These barrels are made in our own cooperage plant, and are tongued and grooved to withstand the rough handling necessary in export trade.

For Mine Officials' Convenience

To any mine official writing us on the stationery of his firm and mentioning the Coal Field Directory, we will send our celluloid computing scale, giving the amounts of cement, sand and stone required per cubic yard of rammed concrete of different proportions.

Use

In practically every type of modern construction, the use of cement is required. In great engineering works, concrete is the essential material.

In mine work concrete has earned a deservedly prominent position for the main buildings of the mine, the homes of mine employes, and also for mine timbering and shaft linings.

The careful selection of the ingredients for concrete is a big factor in the success of the finished work. The selection of Lehigh Cement is a warranty for the most important material used in concrete.

Perhaps the best guarantee on future promise is past performance. The great New York Connecting Railroad; the Municipal Building, New York; the Girard Point Elevators, the League Island Dry Docks, Philadelphia; the Boston Braves' Ball Park; the Chicago and Northwestern Railway Terminal; the Quay and Sea Walls, Charlestown; the Galveston Causeway—these are a few of the structures where Lehigh is on the job.

A typical example of the adaptability of concrete to varying structural requirements. Chimneys and building are of concrete.

KEYSTONE
THE.
MINING
CATALOG
COMBINED WITH
COAL FIELD
DIRECTORY
CONSOLIDATED PUBLISHING
COMPANY INC.

COKE OVEN SECTION

Engineering Data

Coke Oven Construction.

Coal Tar Tree

Standardization of Shapes.

The following manufacturer has catalogue descriptions in this section:

Scottdale Machine & Manufacturing Co.

For additional descriptions of Ventilating Equipment not appearing in this section refer to index of Products in front of the book.

Coke Oven Data

Courtesy Harbison-Walker Refractories Co. and United Fire Brick Co.

There is a tendency to standardize rectangular oven construction, the many advantages to be derived from such a standardization being obvious.

The following dimensions may be regarded as definitely settled:

Batter of outside walls 2½" to the foot

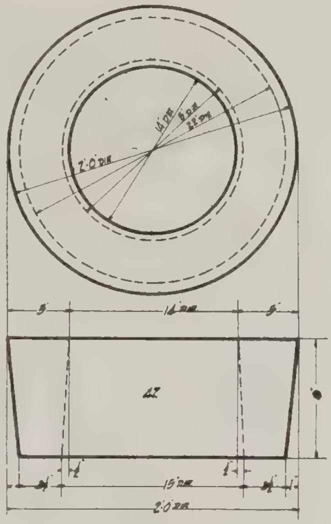
Width of door 5 feet at each end.

Ovens with doors wider at one end than the other are no longer being constructed. There is no standard for the height of the door from the bottom plate to the base of the arch, but it is possible that future ovens will be constructed by using four jambs each 9" in height, making a total height of from 36½" to 37", depending upon the size of the joints. The arch having a span of 5 feet and a rise of 18", giving a radius of 2' 10" may be regarded as definitely accepted as standard.

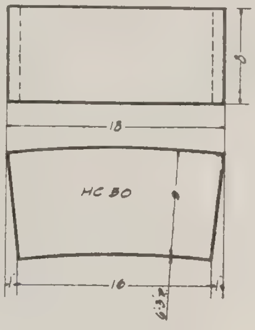
There is a tendency to standardize every fire brick and fire clay shape entering into the construction of rectangular ovens and if these tendencies are supported by those building such ovens in the future it will inevitably result in economy in construction and repairs. Every new design involves a new set of molds and when repairs are needed, instead of being shipped from stock, they have to be made up on special order. Moreover, if repairs are ordered from someone other than the manufacturer furnishing the material in the first instance, more molds would again have to be made. It is also necessary in all lines of business to charge more for material made up on special order than for standard material which can be regularly made and carried in stock.

By the co-operation of all concerned it will likely be possible in the near future for every coke oven fire brick manufacturer to carry in stock material for repairs of standard rectangular coke ovens.

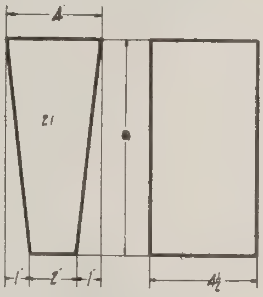
Standard Shapes and Dimensions of Coke Oven Materials



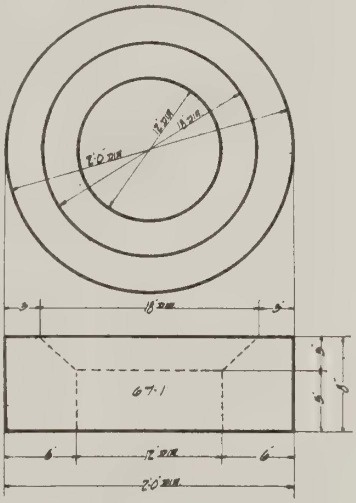
TRUNNEL HEAD



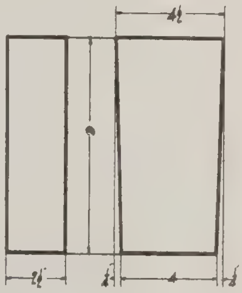
RING WALL BLOCK



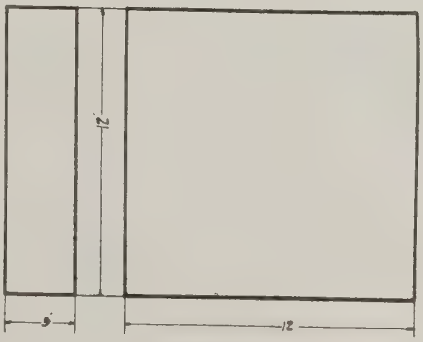
BULLHEAD



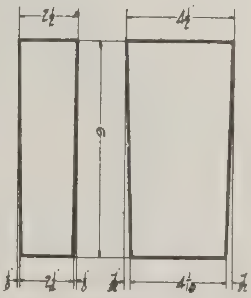
RING



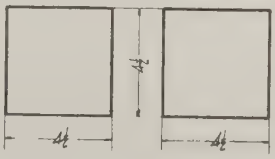
LINER



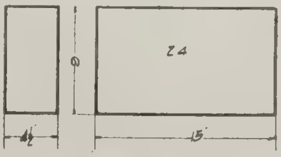
FLOOR TILE



CROWN

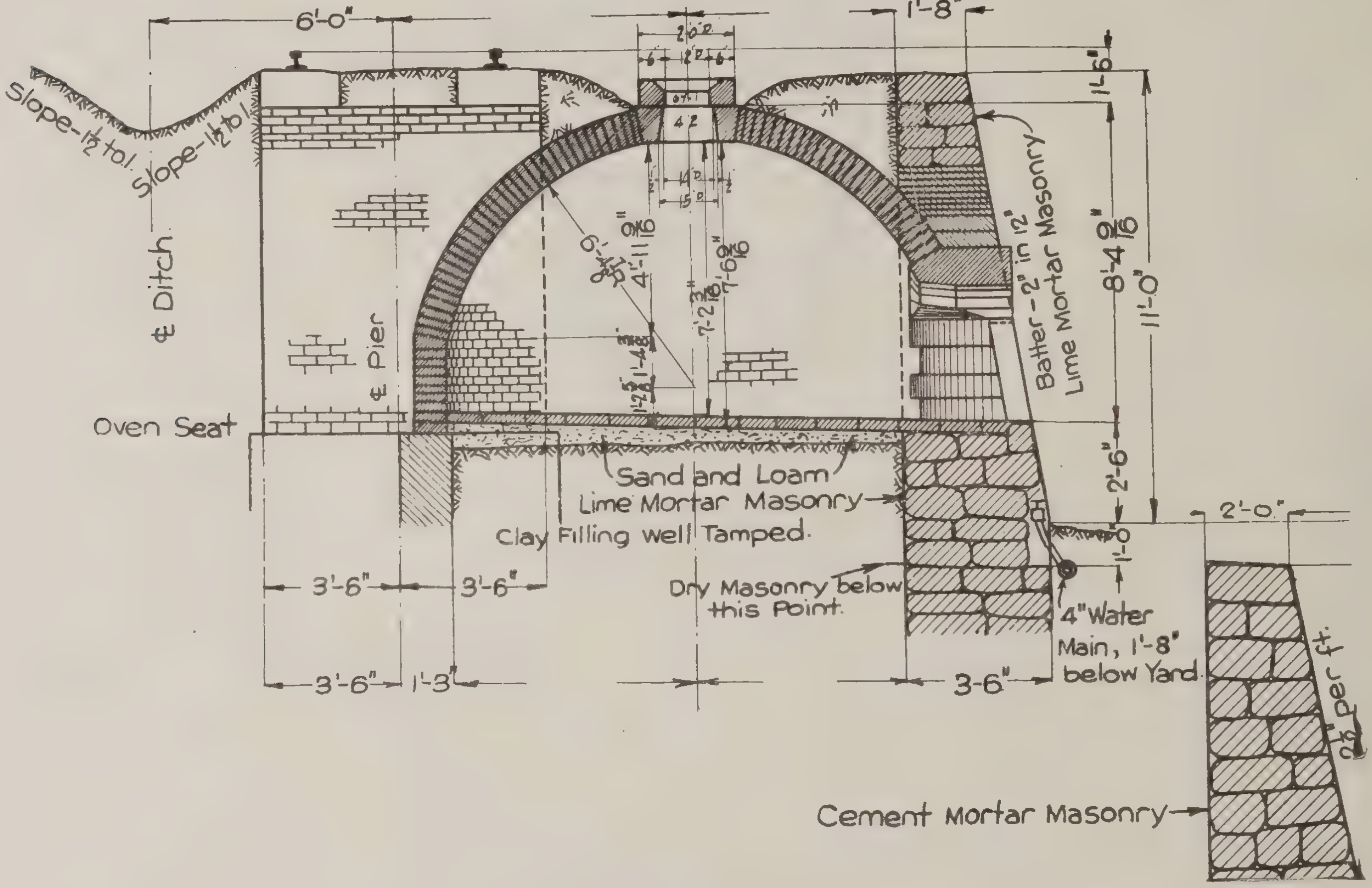


4½ x 4½ x 4½
DOOR BLOCK

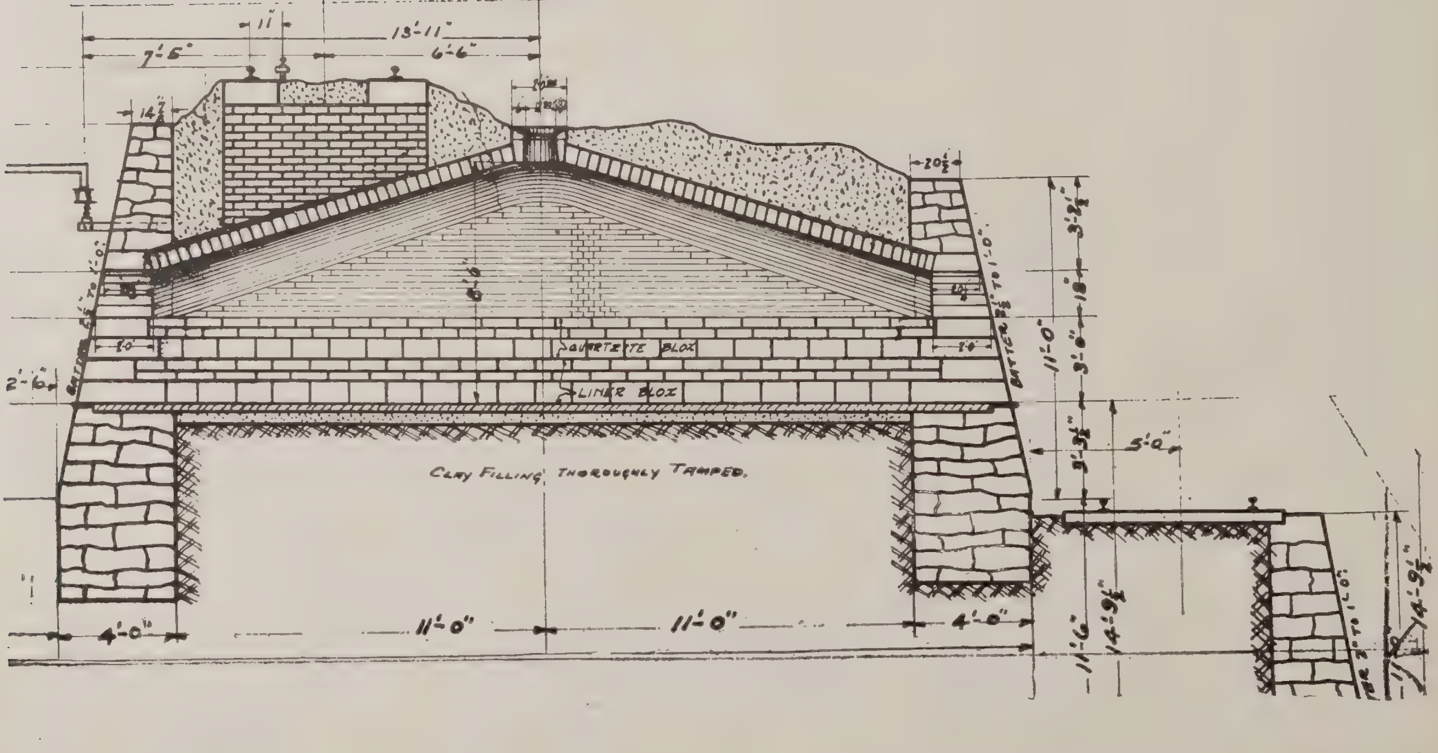


LINER BLOCK

Diagrams Showing Coke Oven Construction

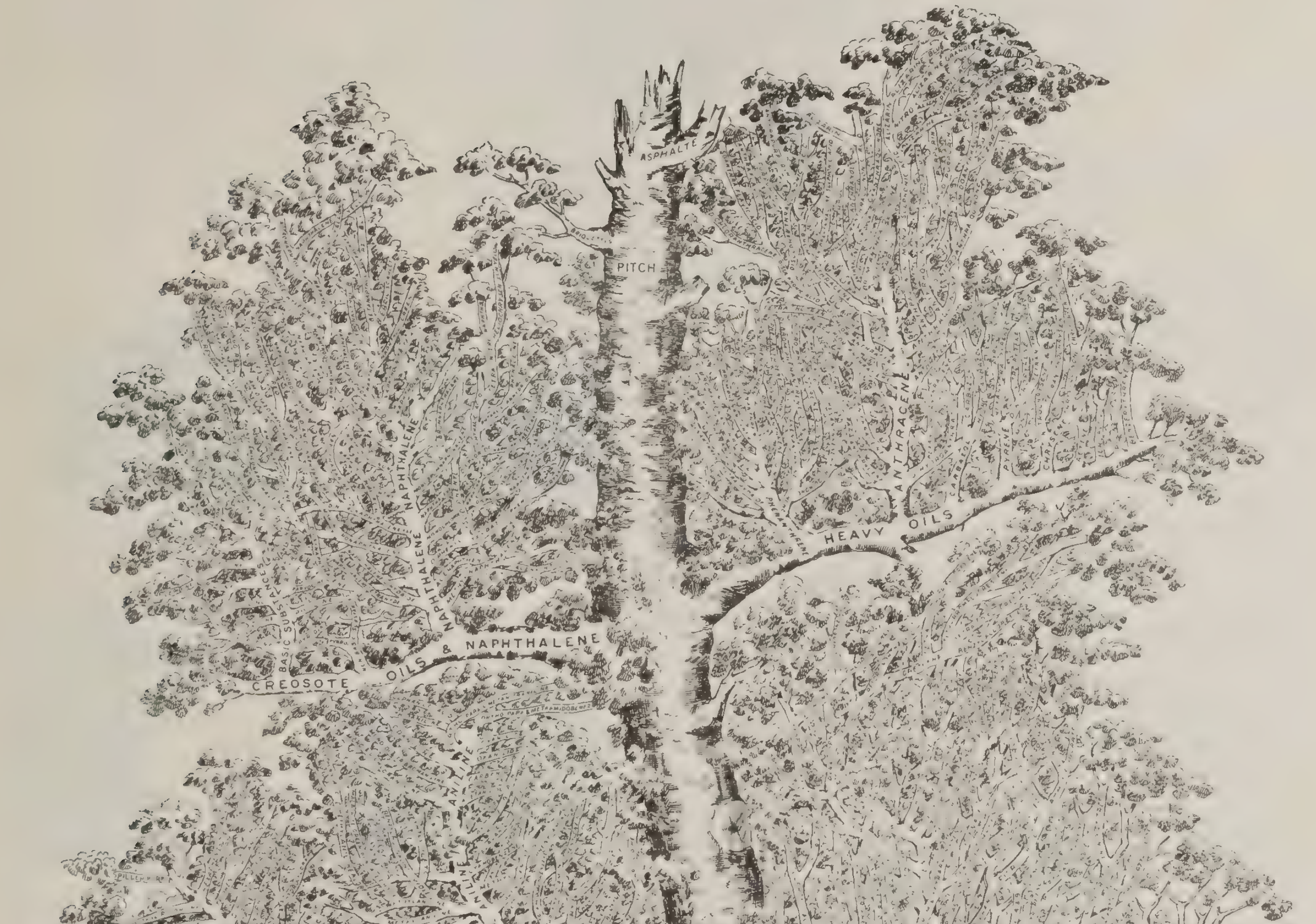


PLAN.



Courtesy Harbison-Walker Refractories Co.

Coal Tar Tree



GENEALOGICAL TREE.

Showing the more important Compounds existing in, and derived from, Coal Tar by distillation, together with those formed by further Chemical treatment, the connecting links being maintained in continuity. Compiled by.

Benj. Nickels F.C.S. F.I.C.

Courtesy C-A-Wood Preserver Co.

Scottdale Machine & Manufacturing Co.

Main Office & Works
SCOTTDALE,
PENNA.

Direct Representatives
S. H. MEEM & CO.,
Bluefield,
W. Va.

J. H. DONAHOO CO.,
Jefferson Co. Bank Bldg.,
Birmingham, Ala.

CROCKWELL MINE & MILL SUPPLY CO.,
Federal Reserve Bank Bldg.,
St. Louis, Mo.

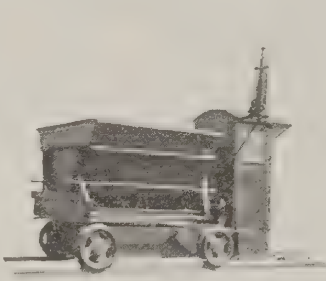
General Specification of "Scottdale" Coking Larries

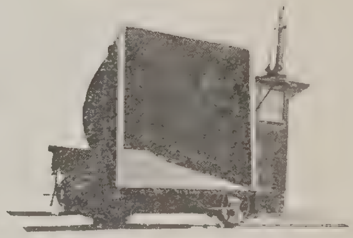
Beside the "Scottdale" coking larry we have been marketing so successfully for 40 years we make special designs of electric cars for handling of rock, slate, coal, stone, ore, etc.

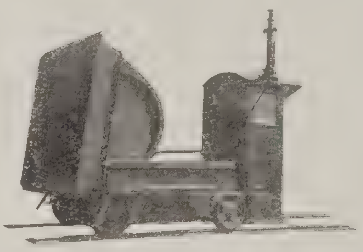
Cuts show a slate larry for handling mine refuse, built in 2, 3 and 4 cu. yd. capacities to dump either side or in front. Car will build its own readway, operate up a 7½ per cent grade. Track gauges vary from 42″ to 4′-8½″, according to capacity.

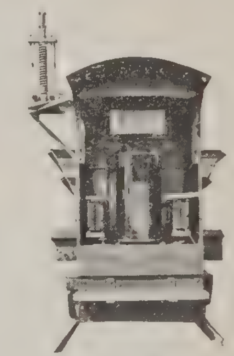
We build other designs of bodies to suit your special requirements.

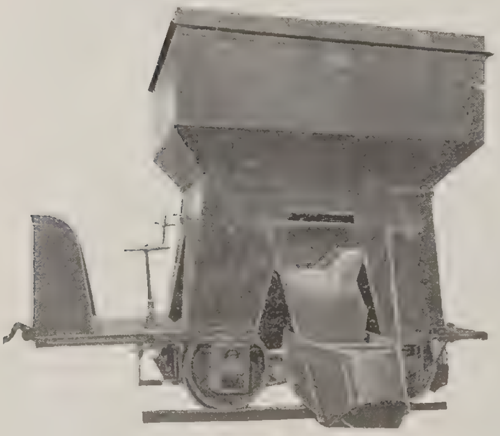
Remember we manufacture Coal Mine Surface Equipment only, and it costs you nothing to get our recommendations and proposals.

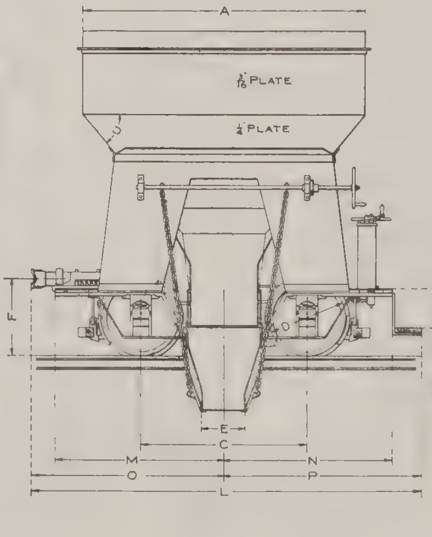

Running Position.

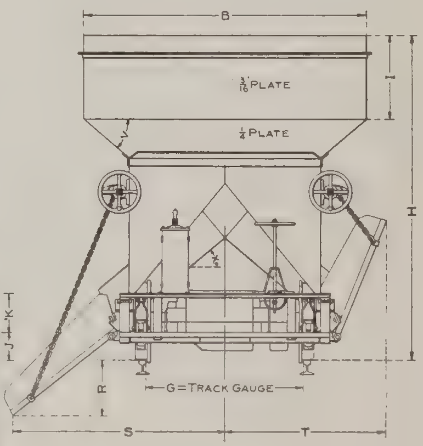

Side Dumping.


Front Dumping.


Rear View.







No. of Larry	H. P. Motor	Larry for	Capacity in cu. ft.	Weight Complete	DIMENSIONS IN INCHES. A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	R	S	T	Degree of Angles U	V	X
1701-25	25	Slack or Washed Coal	390	12,500	120	102	60	28	15⅜	28	56½	130	34	10¾	13¾	141	61	61	69¼	71¾	To Suit Ovens	To Suit Ovens	To Suit Ovens	49	45	40
1701-30	30	Washed Coal	390	12,600	120	102	60	28	15⅜	28	56½	130	34	10¾	13¾	141	61	61	69¼	71¾				49	45	40
220-25	25	M. R.	315	10,200	102	102	60	28	15⅜	28	56½	114	36	10¾	13¾	141	61	61	69¼	71¾				47	36	36
2208-30	30	M. R.	315	10,300	102	102	60	28	15⅜	28	56½	114	36	10¾	13¾	141	61	61	69¼	71¾				47	36	36
1924-25	25	Slack or Washed Coal	290	10,700	102	102	60	28	15⅜	28	56½	122	26	10¾	13¾	141	61	61	61¼	71¾				55	45	40
2233-25	25	Washed Coal	290	10,600	102	102	60	28	15⅜	28	56½	117	30	10¾	13¾	141	61	61	69¼	71¾				50	40	40

KEYSTONE

THE.
MINING
CATALOG
COMBINED WITH
COAL FIELD
DIRECTORY

CONSOLIDATED PUBLISHING

COMPANY INC.

POWER PLANT SECTION

Engineering Data

- The Efficient Operation of Boilers in Mine Plants.
- Model Piping Specifications.
- Table—Water Required per minute to Feed Boilers.
- Table—Properties of Saturated Steam.
- Specification Data for Electric Motors.
- Compressed Air Transmission.
- Table—H. P. Required (Single Stage Compression).
- Table—H. P. Required (Two-Stage Compression).
- Table—H. P. Required (Three-Stage Compression).
- Table—Loss of Pressure in Compressed Air Transmission.
- Table—Discharge of Air Through an Orifice.
- Table—Air Required to Run Drills.
- Standard Specifications for Lap-Welded Seamless Steel Boiler Tubes.
- Mechanical, Electrical and Heat equivalents.
- Cost of Fuel per Boiler Horse-Power.
- Horse-Power Transmitted by Leather Belts.

The following manufacturers have catalogue descriptions in this section:

Allis-Chalmers Mfg. Co.
American Steam Gauge & Valve Co.
Armstrong Cork & Insulation Co.
Armstrong Mfg. Co.
Ashton Valve Mfg. Co.
Ball Engine Co.
Boylston Steam Specialty Co.
Brownell Co.
Cancos Mfg. Co.
Chandler & Taylor Co.
Cling Surface Co.
Combustion Engineering Corp.
Coppus Engineering & Equipment Co.
Dodge Sales & Engineering Co.
Durabla Mfg. Co.
Fairbanks Co., The
Foster Engineering Co.
Freeman, S. & Sons Mfg. Co.
Gem Mfg. Co.
General Electric Co.
Golden-Anderson Valve Specialty Co.
Goodrich, B. F., Co.
Harrison Safety Boiler Works.
Homesteal Valve & Mfg. Co.
Houston, Stanwood & Gamble Co.
Ingersoll-Rand Co.
Jenkins Bros.
Johns-Pratt Co., The.
Keeler, E., Co.
McClave-Brooks Co.
Mitchell, W. K. & Co., Inc.
National Valve & Mfg. Co.
New Jersey Car Spring & Rubber Co.
New York Belting & Packing Co.
New York Cordage Co.
Nicholson, W. H. Co.
Peerless Rubber Mfg. Co.
Permutit Co., The
Pittsburgh Filter Mfg. Co.
Quaker City Rubber Co.
Ridgway Dynamo & Engine Co.
Scaife, Wm. B. & Sons
Simonds, G. L. & Co.
Sims Co.
Sterling Equipment & Supply Co.
Union Iron Works.
Universal Lubricator Co.
Valley Iron Works.
Walsh & Weidner Boiler Co.
Westinghouse Air Brake Co.
Westinghouse Elec. & Mfg. Co.
Wickes Boiler Co.
Vogt, Henry Machine Co.

For additional descriptions of Power Plant Equipment not appearing in this section, refer to Index of Products in front of book.

STANDARD SPECIFICATIONS FOR POWER PIPING.

Adopted by the Power Piping Society June 24, 1915.

General Requirements

In the absence of a distinct specification by the Purchaser for material of a better grade, all material furnished shall conform to these specifications.

It is the intention that all material furnished hereunder shall be of the quality and weight which experience has shown to be safe and economical, hence the pressures specified are somewhat under those at which satisfactory service can be expected under favorable conditions, but as high as good practice will permit.

In the event of a specification by the Purchaser for service more severe for a given class of material than that given herein such material shall be furnished at the Purchaser's risk, and any guarantees for such material made hereunder become null and void.

Materials

Castings: All castings shall be smooth and free from injurious defects.

Cast Steel: The metal in steel castings shall conform to the requirements of the American Society for Testing Materials for "Medium Castings."

Semi-Steel: The metal in semi-steel castings shall have a tensile strength of not less than 30,000 pounds per square inch. A transverse test of the "Arbitration Bar," as outlined by the American Society for Testing Materials, supported 12 inches between centers shall show before breaking a load of 3,300 pounds and a deflection of not less than .12 inches.

Gray Iron: The metal in gray iron castings shall have a tensile strength of not less than 20,000 pounds per square inch. A transverse test as for Semi-Steel shall show before breaking a load of 2,900 pounds and a deflection of .10 inches.

Dimensions of Flanged Fittings

All standard and extra heavy flanged fittings shall conform to the center to face, thickness, and flange dimensions of the "American Standard," as recommended in 1914 by the A. S. M. E. Fittings used for working steam pressures 25 pounds and lower, and for water pressures 50 pounds and lower, may be lighter in the shell than the American Standard for 125 pounds working pressure.

Drilling and Facing of Flanges

All drilling of flanges shall conform to the templates of the said "American Standard," and shall straddle centers.

Standard flanges shall be plain faced. Extra heavy flanges shall have raised face extending to the inside edge of bolt holes.

Spotfacing and Backfacing

Flanges of Extra heavy Cast Iron or Semi-Steel material shall be either spotfaced or backfaced for all sizes 14 inch and larger. All Cast Steel flanges shall be spotfaced or backfaced.

Type of Joints

The following sizes are the smallest for which flanged joints will be required except for unions. Below these sizes screwed connections may be used.

Superheated Steam	2	inches
Saturated steam above 125 pounds	2½	inches
Boiler Feed	2½	inches
Exhaust	2½	inches
Low Pressure Water	2½	inches
Blow-Off	2	inches
Drains	2½	inches

Valves

Where Valves are required they shall be gate valves except for blow-off, or where their function is that of throttling, or for sizes smaller than ¾ inches, when they shall be either globe or angle valves.

All outside screw gate valves shall be back-seated to provide for re-packing under pressure.

Materials and test pressures for the various services shall be as follows:

Superheated Steam: Gate valves 2 inches and larger shall be extra heavy, outside screw and yoke pattern, with cast steel bodies, bonnets, discs and yokes; monel metal or 23 per cent nickel steel seats and disc rings; monel metal or 23 per cent nickel steel stems; and monel metal or 23 per cent nickel steel back-seating bushing below the stuffing box. Valves 8 inches and larger shall be by-passed.

Globe and angle valves 2 inches and larger shall conform to the same general specification.

All stop valves 1½ inches and smaller shall be extra heavy and shall be made of bronze containing not less than 10 per cent of nickel.

Valves shall be tested to 800 pounds hydrostatic pressure.

Saturated Steam Between 150 Pounds and 250 Pounds Per Square Inch Inclusive: Gate valves 2½inches and larger shall be extra heavy, outside screw and yoke pattern, with semi-steel bodies, bonnets, discs and yokes; bronze seats and disc rings; and bronze stems. Gate valves 8 inches and larger shall be by-passed.

Globe and angle valves 2½ inches and larger shall conform to the same general specification.

All valves 2 inches and smaller shall be extra heavy bronze.

Valves shall be tested to 800 pounds hydrostatic pressure.

Saturated Steam Between 125 Pounds and 149 Pounds Per Square Inch Inclusive: Gate valves 2½ inches and larger shall be medium, outside screw and yoke pattern, tested to 500 pounds hydrostatic pressure, with gray iron bodies, bonnets, discs and yokes; bronze seats and disc rings; and bronze stems.

Gate valves 10 inches and larger shall be by-passed.

Globe and angle valves 2½ inches and larger shall be extra heavy pattern, tested to 800 pound hydrostatic pressure, but other wise to the same general specification.

All valves 2 inches and smaller shall be extra heavy bronze, tested to 500 pounds hydrostatic pressure.

Boiler Feed Between 125 Pounds and 250 Pounds Per Square Inch Inclusive: Gate valves 2½ inches and larger shall be extra heavy, outside screw and yoke pattern, with semi-steel bodies, bonnets, discs and yokes; bronze seats and disc rings and bronze stems.

Globe and angle valves 2½ inches and larger shall conform to the same general specification.

Check valves 2½ inches and larger shall be extra heavy pattern, with bronze seats and disc rings.

All valves 2 inches and smaller shall be extra heavy bronze.

Valves shall be tested to 800 pounds hydrostratic pressure.

Exhaust: Gate valves 14 inches and larger shall be outside screw and yoke, low pressure pattern, suitable for 25 pounds working steam pressure, with gray iron bodies, bonnets, discs and yokes; bronze seats and disc rings; and rolled steel stems. Where space does not permit using outside screw and yoke, inside screw patterns may be used.

Gate valves 2½ inches to 12 inches inclusive, shall be standard pattern, outside screw and yoke, suitable for 125 pounds working pressure, with gray iron bodies, bonnets, discs and yokes; bronze seats and disc rings; and rolled steel stems.

Gate valves 2 inches and smaller shall be standard brass.

Suction and Low Pressure Water: Gate valves shall conform to the same specification as for "**Exhaust**" except that in every case bronze stems shall be used.

Check valves shall be standard pattern swing checks with bronze seats and disc rings.

Blow-Off: Blow-off connections shall be double valved.

Drains Between 125 Pounds and 250 Pounds Per Square Inch: Valves shall conform to the specification for those for "Saturated Steam between 150 and 250 pounds per square inch inclusive."

Low Pressure Drains: Valves shall conform to the specifications for those for "**Exhaust.**"

Non-Return Valves: Non-return valves, either globe or angle type, shall be provided in each boiler connection. They shall work quietly, and shall automatically prevent the flow of steam from the lines to the boilers and shall be provided with means for closing by hand.

For Superheated Steam they shall be extra heavy, cast steel completely monel mounted, with monel metal pistons and dash pots if same are internal, and monel metal stems.

For Saturated Steam up to 250 pounds per square inch they shall be semi-steel, completely bronze mounted, with bronze pistons and dash pots and bronze stems.

Non-return valves shall be installed preferably with stems in a vertical position.

Fittings

Superheated Steam: Fittings 2 inches and larger shall be extra heavy, cast steel. Fittings 1½ inches and smaller shall be forged or cast steel.

Saturated Steam, Boiler Feed and Drains Between 125 Pounds and 250 Pounds Per Square Inch, Inclusive: Fittings 2½ inches and larger shall be extra heavy, semi-steel. Elbows for boiler feed shall be long radius where possible. Fittings 2 inches and smaller shall be extra heavy, gray iron.

Exhaust, Suction, Low Pressure Water and Low Pressure Drains: Fittings 14 inches and larger shall be low pressure, gray iron, suitable for 25 pounds working steam pressure. Fittings 12 inches and smaller shall be standard cast iron.

Flanged elbows for water shall be long radius where possible.

Blow-Off: Fittings shall be extra heavy semi-steel. Long radius fittings shall be used where possible.

Pipe, Flanges and Unions

Van Stone flanges shall fit the pipe closely. The lap shall be finished off to the inside edge of the bolt holes and faced with a fine tool finish.

Screw flanges shall be made up by machine where possible and all extra heavy flanges made up in the shop shall be refaced.

Steel flanges shall correspond in thickness to the flange of the American Standard for Fittings.

Superheated Steam: Flanges 6 inches and larger shall be high hub steel, Van Stoned. Flanges 5 inches and smaller shall be steel, screwed.

Saturated Steam Between 150 Pounds and 250 Pounds Inclusive: Flanges 6 inches and larger shall be low hub steel, Van Stoned.

Flanges 5 inches and smaller shall be extra heavy semi-steel screwed.

Saturated Steam Between 125 Pounds and 149 Pounds Per Square Inch Inclusive: Flanges 14 inches and larger shall be extra heavy high hub semi-steel Van Stoned.

Flanges 12 inches and smaller shall be extra heavy semi-steel screwed.

Boiler Feed and Drain Piping Between 125 Pounds ant 250 Pounds Per Square Inch Inclusive: Flanges shall be extra heavy semi-steel screwed.

Exhaust, Suction, Low Pressure Water and Low Pressure Drains: Flanges 14 inches and larger shall be standard cast iron pattern, Van Stoned.

Flanges 12 inches and smaller shall be standard cast iron, screwed.

Blow-Off: Flanges shall be extra heavy semi-steel, screwed.

Unions: On all screwed work a sufficient number of unions shall be used to facilitate repairs. One union shall be used near each screwed valve. Unions 1½ inches and larger shall be flanged and below 1½ inches they shall be gasketless, with non-corrosive seats.

Wrought Pipe

Wrought pipe shall be steel. Standard pipe shall be buttwelded for sizes 3 inches and smaller and lapwelded for sizes 3½ inches and larger. Extra strong pipe shall be buttwelded for sizes 2 inches and smaller and lapwelded for sizes 2½ inches and larger.

Steam Between 150 Pounds and 250 Pounds Per Square Inch Inclusive: Pipe shall be full weight 7 inches and smaller. Sizes larger than 7 inch shall be of the following thickness or weights per foot; 8 inch, 28.55 pounds; 9 inch, 33.90 pounds; 10 inch, 40.48 pounds; 12 inch, 49.56 pounds; 14 to 20 inch, inclusive, ⅜ inches; 22 to 24 inch inclusive, 7/16 inches.

Steam Between 125 Pounds and 149 Pounds Per Square Inch Inclusive; Suction and Low Pressure Water: Pipe shall be full weight 7 inches and smaller. Sizes larger than 7 inch shall be of the following thickness or weights per foot: 8 inch, 24.69; 9 inch, 33.90 pounds; 10 inch, 34.24 pounds; 12 inch, 43.77 pounds; 14 to 20 inch inclusive, 5/16 inches; 22 inch to 24 inch inclusive, ⅜ inches.

Boiler Feed: Pipe for pressure between 150 and 250 pounds per square inch inclusive shall be extra strong and between 125 pounds and 149 pounds per square inch inclusive, shall conform to the specification for "Steam" for the same pressures.

Exhaust Piping: Pipe 7 inches and smaller shall be full weight; 8 inch to 12 inch inclusive, shall be the same as for "Steam" between 125 pounds and 149 pounds inclusive; between 14 inches and 18 inches inclusive it shall be ¼ inch; and between 20 inches and larger it shall be of the lightest card weight.

Blow-Off: Pipe shall be extra strong.

Drains: Pipe shall conform to the specification for Steam Piping for the same pressure and service.

Welding: Where it is advisable economically, branches shall be welded to main piping, in preference to the use of fittings. All welds so made shall receive a hammer test under hydrostatic pressure three times the working pressure. The fillets and branches if buttwelded shall be built up to a radius equal to not less than three times the thickness of the pipe wall.

Bends: Bends shall be used for changes of alignment in preference to fittings. They shall be substantially round in section and free from injurious buckles. Radii equal to not less than 6 diameters of the pipe shall be used where possible.

Cast Iron Pipe

Where used for exhaust, suction, and low pressure water, Cast Iron pipe shall correspond in thickness to "Class A" pipe as specified by the American Water Works Association.

Bolts

All flange bolts 1½ inches in diameter and smaller shall have square heads and U. S. Standard hexagonal cold punched chamfered and trimmed nuts. For bolts larger than 1½ inches studs with two nuts may be used. When pulled up the bolt thread shall extend completely through the nut.

Gaskets

Gaskets shall fit inside of bolt holes for all lines not under vacuum. Vacuum lines shall have full faced gaskets.

Sheet Gaskets up to and including 12 inch size shall be 1/16 inch thick and for 14 inch and larger they shall be 3/32 inches thick.

Superheated Steam: Gaskets shall be superheated sheet or metal.

Saturated Steam; Boiler-Feed, Blow-Off and Drains: Gasket shall be Rainbow or equivalent, or corrugated copper.

Exhaust: Gaskets shall be Rainbow or equivalent.

Suction and Low Pressure Water: Gaskets shall be cloth inserted rubber or equal.

Supports

A sufficient number of supports, preferably hangers, shall be provided and so placed that their working stresses shall have a factor of safety of not less than six, assuming that each hanger is bearing its proportion of the load with the line full of water.

Sufficient anchorage shall be provided where necessary.

If roller supports are used they shall have screw adjustment.

Piping Not Shown

Piping and appurtenances such as drains, traps, priming pipes, gage and oil piping, etc., called for but not shown on drawings shall be furnished up to a value of $.................................. for material only at prevailing market prices. Any lines ordered in excess of this amount shall be considered as extra work and shall be furnished at prices to be agreed upon between the Purchaser and the Company.

STANDARD SPECIFICATIONS

For

LAP-WELDED AND SEAMLESS STEEL BOILER TUBES, SAFE ENDS AND ARCH TUBES

[Including Superheater Tubes]
As Revised Jointly, 1913, by the

American Railway Master Mechanics Association

and the

American Society for Testing Materials.

I. Manufacture

1. **Process.** The steel shall be made by the open-hearth process.

II. Chemical Properties and Tests

2. **Chemical Composition.** The steel shall conform to the following requirements as to chemical composition:

Carbon ....0.08—0.18 per cent
Manganese ....0.30—0.50 per cent
Phosphorus ....not over 0.04 per cent
Sulphur ....not over 0.045 per cent

3. **Chemical Analysis.** (a) Analysis of two tubes in each lot of 250 or less may be made by the purchaser, which shall conform to the requirements specified in Section 2. Drillings for analyses shall be taken from several points around each tube.

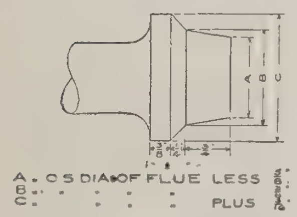
(b) If the analysis of only one tube does not conform to the requirements specified, analyses of two additional tubes from the same lot shall be made, each of which shall conform to the requirements specified.

III. Physical Properties and Tests

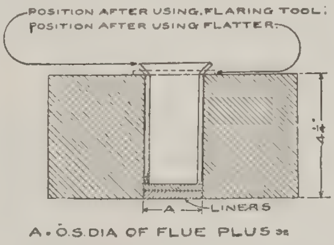
4. **Flange Tests.** (a) A test specimen not less than 4 inches in length shall have a flange turned over at right angles to the body of the tubes without showing cracks or flaws. This flange as measured from the outside of the tube shall be ⅜ in wide for tubes 2½ inches or less outside diameter, and ½ inch wide for tubes larger than 2½ inches outside diameter.

(b) In making the flange test, the flaring tool and die block as shown should be used.

FLARING TOOL.



DIE BLOCK.


POSITION AFTER USING FLARING TOOL;
POSITION AFTER USING FLATTER.
4
A
LINERS
A. O.S. DIA OF FLUE PLUS

5. **Flattening Tests.** A test specimen 4 inches in length shall stand hammering flat until the inside walls are in contact, without cracking at the edges or elsewhere. For lap-welded tubes, care should be taken that the weld is not located at the point of maximum bending.

6. **Crush Tests.** A test specimen 2½ inches in length shall stand crushing longitudinally until the outside folds of metal are in contact, without showing cracks or flaws.

7. **Hydraulic Tests.** Tubes under 5 inches in diameter shall stand an internal hydraulic pressure of 1,000 pounds per square inch, and tubes 5 inches in diameter or over an internal hydraulic pressure of 800 pounds per square inch.

8. **Test Specimens.** (a) Test specimens shall consist of sections cut from tubes selected by the inspector representing the purchaser from the lot offered for shipment. They shall be smooth on the ends and free from burrs.

(b) All specimens shall be tested cold.

9. **Number of Tests.** One flange, one flattening and one crush test shall be made from each of two tubes in each lot of 250 or less. Each tube shall be subjected to the hydraulic test.

10. **Retests.** If the results of the physical tests of only one tube from any lot do not conform to the requirements specified in Sections 4, 5 or 6, retests of two additional tubes from the same lot shall be made, each of which shall conform to the requirements specified.

IV. Standard Weights

11. **Standard Weights.** The standard weights for tubes of various outside diameters and thicknesses are as follows:

WEIGHT IN POUNDS PER FOOT OF LENGTH.

Thickness.		Outside Diameter in Inches.												
Inches	Nearest B. W. G.	1¾	2	2¼	2½	3	*3½	*4	*4½	*5	*5¼	*5⅜	*5½	*6
0.095	13	1.68	1.93	2.19	2.44	...	...	...	...	...	...	...	...	...
0.110	12	1.93	2.22	2.51	2.81	3.40	...	...	...	...	...	...	...	...
0.125	11	2.17	2.50	2.84	3.17	3.84	4.51	...	...	...	...	...	...	...
0.135	10	2.33	2.69	3.05	3.41	4.13	4.85	5.57	...	...	...	...	...	...
0.150	9	2.56	2.96	3.36	3.76	4.57	5.37	6.17	6.97	7.77	8.17	8.37	8.57	9.37
0.165	8	...	...	...	4.11	5.00	5.88	6.76	7.64	8.52	8.96	9.18	9.40	10.28
0.180	7	...	...		4.46	5.42	6.38	7.34	8.30	9.27	9.75	9.99	10.23	11.19

12. **Permissible Variations.** The weight of the tubes shall not vary more than 5 per cent from that specified in Section 11.

V. Workmanship and Finish

13. **Workmanship.** The finished tubes shall be circular within 0.02 inch, and the mean outside diameter shall not vary more than 0.015 inch from the size ordered. The thickness at any point shall not vary more than 10 per cent from that specified. The length shall not be less, but may be 0.125 inch more than that ordered.

14. **Finish.** The finished tubes shall be free from injurious defects and shall have a workmanlike finish. They shall be free from kinks, bends and buckles.

VI. Marking

15. **Marking.** The name or brand of the manufacturer and "Tested at 1000 Pounds" for tubes under 5 inches in diameter, or "Tested at 800 pounds," for tubes 5 inches in diameter or over, shall be legibly stenciled in white on each tube.

VII. Inspection and Rejection

16. **Inspection.** The inspector representing the purchaser shall have free entry at all times while work on the contract of the purchaser is being performed, to all parts of the manufacturer's works which concern the manufacture of the tubes ordered. The manufacturer shall afford the inspector, free of cost, all reasonable facilities to satisfy him that the tubes are being furnished in accordance with these specifications. All tests (except check analyses) and inspection shall be made at the place of manufacture prior to shipment, unless otherwise specified, and are to be so conducted as not to interfere unnecessarily with the operation of the works.

17. **Rejection.** (a) Tubes when inserted in the boiler shall stand expanding and beading without showing cracks or flaws, or opening at the weld. Tubes which fail in this manner will be rejected and the manufacturer shall be notified.

(b) Unless otherwise specified, any rejection based on tests made in accordance with Section 3, shall be reported within five working days from the receipt of samples.

18. **Rehearing.** Samples tested in accordance with Section 3, which represents rejected tubes, shall be preserved for two weeks from the date of the test report. In case of dissatisfaction with the results of the test, the manufacturer may make claim for a rehearing within that time.

Note*. It is regular practice to furnish for locomotive purposes sizes larger than 3" O. D. in Seamless only.

The Economy of Stoker Equipment for Mine Power Plants

By JOHN VAN BRUNT, M. E.,

In many coal mining operations the boiler plant and its economical operation receives but scant consideration, because coal at the mine is cheap. If the cost of power seems high, attempts to reduce it usually end before the boiler room is reached, again because coal is cheap and because the labor for firing it is considered a necessary expense not susceptible of reduction.

Under conditions existing at the average coal mine, the problem of making steam is different than elsewhere, in that the labor cost of firing coal and removing ashes will approximate one-half the value of coal fired, when boilers are fired by hand and coal charged to power at the cost of mining.

Consider a boiler plant operating under such conditions, using run of mine for fuel and firing same by hand, and note the possible saving, both in fuel and labor. This condition is a common one and can be greatly improved in several directions--creaper fuel—reduced labor—more efficient boiler operation and greater capacity.

The choice of cheaper fuel lies between slack and refuse. The former we will dismiss, as it is a marketable fuel of nearly the same value as run of mine.

There remains the refuse which has a fairly good heating value, considering the amount of incombustible matter in it. The heat value may be assumed at form 9,000 to 10,500 B. T. U's, with the ash content ranging between 20% and 35%. To burn fuel of this character by hand firing, is out of the question, because of the additional quantity to be handled, requiring more labor and the practical difficulties of getting the capacity out of the boilers. To utilize this waste, it must be burned in mechanical stokers of a type suited to the character of the fuel. Generally speaking, a different type of stoker and furnace is required for anthracite than for bituminous, the main features of the problem are in other respects the same.

With the proper stoker selected, the next point to determine is the size of the stoker which will be determined by the size of boiler, and the power required from it and limited by the dimensions of the boiler. Sufficient stoker capacity to operate the boilers continuously at 150 to 200% of rating should be provided. At these ratings the efficiency will be lower than if operated at rating, but the gain in capacity much more than offsets the decrease in efficiency, as fewer boilers are required.

Having determined the type and size of stoker, the next step is to select the coal and ash conveying machinery, bearing in mind that about 40% more refuse than run of mine must be handled, also that the ash will be about four times as much as ash from run of mine. If the contour of the ground permits, the fuel should reach the stoker hoppers by gravity alone, that is, dumped in bunkers above the stokers directly from cars from the refuse pile, elevators or conveyors being eliminated as far as possible, except in so far as labor may be saved.

The disposal of ashes should be considered with the same idea in view—the elimination of as much labor as possible. The selection of the best means will depend on the conditions. Whether a conveyor—ash drag—or small cars drawn by cable or electric locomotive, or horses, is the best method, can be determined by a careful analysis of the conditions and costs.

Where plenty of water is available and surrounding ground permits, ashes may be flushed out of ash pits continuously.

Obviously such an equipment will take but little labor to operate the stokers. It will require one fireman to four, five or six boilers, depending on the size, no coal passers, and one or two men to remove ashes. At no time after fuel reaches the bunkers will a shovel be used. The fireman will have to look after the water and see that the stokers are working properly, oiling stokers and forced draft fans and engines.

If a coal and ash conveyor are found necessary, they should be of ample capacity and most substantial. The power to operate them is not as important a factor as in plants where coal is costing $2.00 to $4.00 per ton.

Many mine boiler plants are so aranged that the installation of mechanical equipment would be exceedingly expensive, due to boilers of small capacity, expense of providing for ash removal, and coal conveyors. Even such are capable of changes that will greatly reduce operating costs, if indeed it is not more economical to build a new plant or large units, designed to handle and burn a low grade fuel or refuse at a minimum cost.

The apparent cost of stokers and conveying machinery for this purpose is high because of the larger sizes and capacities required ,and because of the high unit cost of stokers where boilers are of small sizes, but when it is considered that a fuel of no market value can be substituted for run of mine or slack, worth at the mine from $1.10 to 80c per ton, the apparent high cost becomes only a reasonable cost. It may be said that the saving in fuel will more than pay for the stokers—the extra capacity will cost nothing, and the saving in labor will pay for the coal and ash handling equipment.

A large number of anthracite producers have modernized their plants in this manner and are burning silt and culm, operating their boilers at 150 to 200% of rating. The same may also be said of bituminous operators. Central power plants have been built to operate several mines, the power being distributed electrically. Most of these central plants are modern in every respect, but many are burning a marketable fuel, possibly because sufficient power cannot be developed from refuse.

Chief Engineer,
Combustion Engineering Corporation,
New York.

Quantity of Feed Water Required to Supply Boiler.

Horse-Power of Boiler.	Quantity of Feed Water Required.		Temperature of Feed Water. Degrees Fahr.
	Gallons per Minute	Pounds per Hour.	
50	3.60 to 4.20	1599 to 2029	100 to 212
100	6.57 to 7.63	3285 to 3815	100 to 212
200	13.14 to 15.26	6590 to 7630	100 to 212
250	16.43 to 19.07	8215 to 9535	100 to 212
300	19.71 to 22.89	9855 to 11445	100 to 212
400	26 28 to 30.52	13140 to 15260	100 to 212
500	32.85 to 38.15	16425 to 19075	100 to 212
600	39.42 to 45.78	19710 to 22890	100 to 212
800	52.26 to 61.04	26280 to 30520	100 to 212
1000	65.70 to 76.30	32350 to 38150	100 to 212
1200	78.84 to 91.56	39420 to 45780	100 to 212
1500	98.55 to 114.45	49275 to 57225	100 to 212
1800	118.26 to 137.34	59130 to 68670	100 to 212
2200	144.50 to 167.80	71290 to 83930	100 to 212
3000	197.10 to 228.90	98500 to 114500	100 to 212
3500	229.95 to 267.05	114975 to 133525	100 to 212
4500	295.65 to 343.35	147825 to 171675	100 to 212
6000	394.20 to 457.80	197100 to 228900	100 to 212
7000	459.90 to 534.10	229950 to 267050	100 to 212

Properties of Saturated Steam

(Peabody)

Pressure by Gauge, Lbs. per Sq. In.	Temperature of Steam, Degrees, Fahr.	Total Heat of Steam in B. T. U. above Water at 32° Fahr.	Weight of Steam, Pounds per Cubic Foot	Relative Volume, Water at 39° F. = 1
0.	212.0	1146.6	.0379	1646.0
5.3	227.9	1151.5	.0507	1231.0
15.3	250.2	1158.3	.0742	841.3
25.3	267.1	1163.4	.0972	642.0
35.3	280.9	1167.6	.1198	520.5
45.3	292.5	1171.2	.1422	438.5
55.3	302.7	1174.3	.1643	379.3
65.3	311.8	1177.0	.1862	334.5
75.3	320.0	1179.6	.2080	299.4
85.3	327.6	1181.8	.2296	271.1
100.3	337.8	1185.0	.2617	237.6
105.3	341.0	1185.9	.2724	228.3
110.3	344.1	1186.9	.2830	219.6
115.3	347.1	1187.8	.2936	211.6
120.3	350.0	1188.7	.3042	204.2
125.3	352.8	1189.5	.3147	197.3
130.3	355.5	1190.4	.3253	190.9
135.3	358.2	1191.2	.3358	184.9
140.3	360.7	1192.0	.3463	179.2
145.3	363.3	1192.7	.3567	173.9
150.3	365.7	1193.5	.3671	169.0
155.3	368.2	1194.2	.3775	164.3
160.3	370.5	1194.9	.3879	159.8
165 3	372.8	1195.7	.3983	155.6
170 3	375.1	1196.3	.4087	151.6
175.3	377.3	1197.0	.4191	147.8
180.3	379.5	1197.7	.4296	144.2
185.3	381.6	1198.3	.4400	140.8
190.3	383.7	1199.0	.4503	137.5
195.3	385.7	1199.6	.4605	134.5
200.3	387.7	1200.2	.4707	131.5

Table Showing Cost of Evaporating 1000 Pounds of Water, with Different Grades of Fuel and Varying Evaporations.

Actual Evaporation per Pound Fuel	PRICE OF COAL PER TON									
	$0.75	$1.00	$1.25	$1.50	$1.75	$2.00	$2.50	$3.00	$3.50	$4.00
	COST OF EVAPORATING 1,000 POUNDS OF WATER									
5. lbs. .	.0750	.1000	.1250	.1500	.1750	.2000	.2500	.3000	.3500	.4000
5.5 " .	.0681	.0909	.1136	.1363	.1591	.1818	.2272	.2727	.3182	.3636
6. " .	.0625	.0832	.1041	.1250	.1458	.1666	.2082	.2500	.2916	.3333
6.5 " .	.0577	.0769	.0961	.1154	.1349	.1538	.1923	.2307	.2692	.3077
7. " .	.0535	.0714	.0892	.1071	.1250	.1428	.1785	.2143	.2500	.2857
7.5 " .	.0500	.0666	.0833	.1000	.1166	.1333	.1666	.2000	.2333	.2666
8. " .	.0469	.0625	.0781	.0937	.1093	.1250	.1562	.1875	.2187	.2500
8.5 " .	.0441	.0588	.0735	.0882	.1029	.1176	.1470	.1764	.2059	.2353
9. " .	.0416	.0555	.0694	.0833	.0972	.1111	.1389	.1666	.1944	.2222
9.5 " .	.0394	.0526	.0657	.0789	.0921	.1052	.1316	.1578	.1842	.2105
10. " .	.0375	.0500	.0625	.0750	.0875	.1000	.2250	.1500	.1750	.2000
10.5 " .	.0357	.0476	.0595	.0714	.0833	.0952	.1190	.1428	.1666	.1994
11. " .	.0340	.0454	.0568	.0681	.0795	.0909	.1136	.1363	.1590	.1818

Compressed Air Transmission

In theory there are two ideal methods of compressing and utilizing air, adiabatically or isothermally.

Adiabatic compression and utilization means that the air is compressed and expanded without transmission of heat to or from the gas.

Isothermal compression and utilization means that the air is compressed and expanded with the addition or rejection of sufficient heat to maintain the air at a constant temperature.

Single Stage Compression

The table shows the horse power required under the conditions named to compress one cubic foot of free air per minute to different gauge pressures by single stage compression.

In columns five and eight of the table below are shown the theoretical horsepowers required for isothermal and adiabatic compression. The results of isothermal compression are wholly unattainable in practice, and are placed here only for purposes of comparison. They represent an ideal which it is desirable always to keep in view. The figures given in the column of adiabatic compression are based on the assumptions that there is no radiation of heat from the air cylinder, and that the temperature of the air after delivery had become normal its volume being therefore reduced to that which is practically available for use. No allowances are included in these figures to cover losses other than that due to the heating of the air compression. But the full amount of loss represented by adiabatic compression can never be suffered in the operation of compressors, however imperfect their design. The actual compression line must always be lower than the adiabatic line, because of the radiation of heat through the cylinder walls. In ordinary, single-stage compressors, properly water-jacketed and run at a reasonable piston speed, the compression line falls considerably below the adiabatic line. Whatever diminution of loss is effected by cooling of the air in the cylinder may therefore be credited against the other unavoidable losses, partially offsetting them, viz: fractional or mechanical loss in the compressor, friction of inlet valves, heating of the intake air by contact with the hot metal surfaces, and piston clearance of the cylinder. These losses are variable in amount depending on the design of the compressor.

In the absence of indicator cards giving the actual results in individual cases, estimates based on practice may be made of the net power loss experienced in operating compressors, which will be convenient for reference. With this understanding, an attempt is made in column nine of the table to show the actual horse power required to compress one cubic foot of free air, under the condition stated at top of the column. Fifteen per cent, is assumed as a fair estimate in case of well designed and operated single stage compressors, of the additional power required, over and above that for theoretical adiabatic compression; this fifteen per cent. being taken as: the loss in purely adiabatic compression minus the effect of ordinary water-jacket cooling, plus the other three losses mentioned at end of preceeding paragraph.

The figures in columns five, eight and nine (which are for free air), if multiplied by the corresponding ratios of compression (Column 3), will give the respective theoretical and actual power costs of furnishing one cubic foot of compressed air, at the gauge pressure stated.

HORSE-POWER REQUIRED

FOR COMPRESSING ONE CUBIC FOOT OF FREE AIR PER MINUTE (ISOTHERMALLY AND ADIABATICALLY) FROM ATMOSPHERIC PRESSURE (14.7 POUNDS) TO VARIOUS GAUGE PRESSURES

Single-Stage Compression
Initial Temperature of Air Taken as 60° F.—Jacket-Cooling Not Considered

Gauge Pressure Pounds	Absolute Pressure Pounds	Number of Atmospheres	Isothermal Compression		Adiabatic Compression			
			Mean Effective Pressure	H. P.	Mean Effective Pressure Theoretical	Mean Eff. Pressure plus 15% Friction	H. P. Theoretical	H. P. plus 15% Friction
5	19.7	1.34	4.13	0.018	4.46	5.12	0.019	0.022
10	24.7	1.68	7.57	0.033	8.21	9.44	0.036	0.041
15	29.7	2.02	11.02	0.048	11.46	13.17	0.050	0.057
20	34.7	2.36	12.62	0.055	14.30	16.44	0.062	0.071
25	39.7	2.70	14.68	0.064	16.94	19.47	0.074	0.085
30	44.7	3.04	16.30	0.071	19.32	22.21	0.084	0.096
35	49.7	3.38	17.90	0.078	21.50	24.72	0.094	0.108
40	54.7	3.72	19.28	0.084	23.53	27.05	0.103	0.118
45	59.7	4.06	20.65	0.090	25.40	29.21	0.111	0.127
50	64.7	4.40	21.80	0.095	27.23	31.31	0.119	0.136
55	69.7	4.74	22.95	0.100	28.90	33.23	0.126	0.145
60	74.7	5.08	23.90	0.104	30.53	35.10	0.133	0.153
65	79.7	5.42	24.80	0.108	32.10	36.91	0.140	0.161
70	84.7	5.76	25.70	0.112	33.57	38.59	0.146	0.168
75	89.7	6.10	26.62	0.116	35.00	40.25	0.153	0.175
80	94.7	6.44	27.52	0.120	36.36	41.80	0.159	0.182
85	99.7	6.78	28.21	0.123	37.63	43.27	0.164	0.189
90	104.7	7.12	28.93	0.126	38.89	44.71	0.169	0.195
95	109.7	7.46	29.60	0.129	40.11	46.12	0.175	0.201
100	114.7	7.80	30.30	0.132	41.28	47.46	0.180	0.207
110	124.7	8.48	31.42	0.137	43.56	50.09	0.190	0.218
120	134.7	9.16	32.60	0.142	45.69	52.53	0.199	0.229
130	144.7	9.84	33.75	0.147	47.72	54.87	0.208	0.239
140	154.7	10.52	34.67	0.151	49.64	57.08	0.216	0.249
150	164.7	11.20	35.59	0.155	51.47	59.18	0.224	0.258
160	174.7	11.88	36.30	0.158	53.70	61.80	0.234	0.269
170	184.7	12.56	37.20	0.162	55.60	64.00	0.242	0.278
180	194.7	13.24	38.10	0.166	57.20	65.80	0.249	0.286
190	204.7	13.92	38.80	0.169	58.80	67.70	0.256	0.294
200	214.7	14.60	39.50	0.172	60.40	69.50	0.263	0.303

Coutesy Ingersoll-Rand Co.

Two and Three Stage Compression

The horse power for two and three stage compression at sea-level, both theoretical and actual, are given in the following tables, the figures in the col-umn headed "Horse power 15% friction," being taken as an approximation to the results obtainable in practice from stage compressors of the usual designs.

Horse-Power Required

For compressing one cubic foot of free air per minute (isothermally and adiabatically) from atmospheric pressure (14.7 pounds) to various gauge pressures.

Two-Stage Compression

Initial Temperature of Air Taken as 60 degrees F.—Jackson-Cooling Not Considered.

Gauge Pressure Pounds	Absolute Pressure Pounds	No. of Atmospheres	Correct Ratio of Cylinder Volumes	Inter-cooler Gauge Pressure	Isothermal Compression		Adiabatic Compression				Percentage of Saving over One-stage Comp.
					Mean Eff. Pressure	H. P.	Mean Eff. Pressure Theoretical	Mean Eff Pressure plus 15% Friction	H. P. Theoretical	H. P. plus 15% Friction	
50	64.7	4.40	2.10	16.2	21.80	0.095	24.30	27.90	0.106	0.123	10.9
60	74.7	5.08	2.25	18.4	23.90	0.104	27.20	31.30	0.118	0.136	11.3
70	84.7	5.76	2.40	20.6	25.70	0.112	29.31	33.71	0.128	0.147	12.3
80	94.7	6.44	2.54	22.7	27.52	0.120	31.44	36.15	0.137	0.158	13.8
90	104.7	7.12	2.67	24.5	28.93	0.126	33.37	38.36	0.145	0.167	14.2
100	114.7	7.80	2.79	26.3	30.30	0.132	35.20	40.48	0.153	0.176	15.0
110	124.7	8.48	2.91	28.1	31.42	0.137	36.82	42.34	0.161	0.185	15.2
120	134.7	9.16	3.03	29.8	32.60	0.142	38.44	44.20	0.168	0.193	15.6
130	144.7	9.84	3.14	31.5	33.75	0.147	39.86	45.83	0.174	0.200	16.3
140	154.7	10.52	3.24	32.9	34.67	0.151	41.28	47.47	0.180	0.207	16.7
150	164.7	11.20	3.35	34.5	35.59	0.155	42.60	48.99	0.186	0.214	16.9
160	174.7	11.88	3.45	36.1	36.30	0.158	43.82	50.39	0.191	0.219	18.4
170	184.7	12.56	3.54	37.3	37.20	0.162	44.93	51.66	0.196	0.225	19.0
180	194.7	13.24	3.64	38.8	38.10	0.166	46.05	52.95	0.201	0.231	19.3
190	204.7	13.92	3.73	40.1	38.80	0.169	47.16	54.22	0.206	0.236	19.5
200	214.7	14.60	3.82	41.4	39.50	0.172	48.18	55.39	0.210	0.241	20.1
210	224.7	15.28	3.91	42.8	40.10	0.174	49.35	56.70	0.216	0.247	
220	234.7	15.96	3.99	44.0	40.70	0.177	50.30	57.70	0.220	0.252	
230	244.7	16.64	4.08	45.3	41.30	0.180	51.30	59.10	0.224	0.257	
240	254.7	17.32	4.17	46.6	41.90	0.183	52.25	60.10	0.228	0.262	
250	264.7	18.00	4.24	47.6	42.70	0.186	52.84	60.76	0.230	0.264	
260	274.7	18.68	4.32	48.8	43.00	0.188	53.85	62.05	0.235	0.270	
270	284.7	19.36	4.40	50.0	43.50	0.190	54.60	62.90	0.238	0.274	
280	294.7	20.04	4.48	51.1	44.00	0.192	55.50	63.85	0.242	0.278	
290	304.7	20.72	4.55	52.2	44.50	0.194	56.20	64.75	0.246	0.282	
300	314.7	21.40	4.63	53.4	45.30	0.197	56.70	65.20	0.247	0.283	
350	364.7	24.80	4.98	58.5	47.30	0.206	60.15	69.16	0.262	0.301	
400	414.7	28.20	5.31	63.3	49.20	0.214	63.19	72.65	0.276	0.317	
450	464.7	31.60	5.61	67.8	51.20	0.223	65.93	75.81	0.287	0.329	
500	514.7	35.01	5.91	72.1	52.70	0.229	68.46	78.72	0.298	0.342	

Horse-Power Required

For compressing one cubic foot of free air per minute (isothermally and adiabatically) from atmospheric pressure (14.7 pounds) to various gauge pressures.

Three-Stage Compression

Initial Temperature of Air Taken as 60 degrees F.—Jacket-Cooling Not Considered.

Gauge Pressure Pounds	Absolute Pressure Pounds	No. of Atmospheres	Correct Ratio of Cylinder Volumes	Intercooler Gauge Pressures		Isothermal Compression		Adiabatic Compression				Percentage Saving over 2-Stage Comp.
				First Stage	Second Stage	Mean Eff. Pressure	H. P	Mean Eff. Pressure Theoretical	Mean Effective Pressure plus 15% Friction	H. P. Theoretical	H. P. plus 15% Friction	
100	114.7	7.8	1.98	14.4	42.9	30.30	0.132	33.30	38.30	0.145	0.167	5.23
150	164.7	11.2	2.24	18.2	59.0	35.59	0.155	40.30	46.50	0.175	0.202	5.92
200	214.7	14.6	2.44	21.2	73.0	39.50	0.172	45.20	52.00	0.196	0.226	6.67
250	264.7	18.0	2.62	23.8	86.1	42.70	0.186	49.20	56.60	0.214	0.246	6.96
300	314.7	21.4	2.78	26.1	98.7	45.30	0.197	52.70	60.70	0.229	0.264	7.28
350	364.7	24.8	2.92	28.2	110.5	47.30	0.206	55.45	63.80	0.242	0.277	7.64
400	414.7	28.2	3.04	30.0	121.0	49.20	0.214	58.25	66.90	0.253	0.292	8.33
450	464.7	31.6	3.16	31.8	132.3	51.20	0.223	60.40	69.40	0.263	0.302	8.36
500	514.7	35.0	3.27	33.4	142.4	52.70	0.229	62.30	71.70	0.273	0.314	8.38
550	564.7	38.4	3.38	35.0	153.1	53.75	0.234	65.00	74.75	0.283	0.326	8.80
600	614.7	41.8	3.47	36.3	162.3	54.85	0.239	66.85	76.90	0.291	0.334	8.86
650	664.7	45.2	3.56	37.6	171.5	56.00	0.244	67.90	78.15	0.296	0.340	9.02
700	714.7	48.6	3.65	38.9	180.8	57.15	0.249	69.40	79.85	0.303	0.348	9.18
750	764.7	52.0	3.73	40.1	189.8	58.10	0.253	70.75	81.40	0.309	0.355	
800	814.7	55.4	3.82	41.4	199.5	59.00	0.257	72.45	83.25	0.315	0.362	
850	864.7	58.8	3.89	42.5	207.8	60.20	0.262	73.75	84.90	0.321	0.369	
900	914.7	62.2	3.95	43.4	214.6	60.80	0.265	74.80	86.00	0.326	0.375	
950	964.7	65.6	4.03	44.6	224.5	61.72	0.269	76.10	87.50	0.331	0.381	
1000	1014.7	69.0	4.11	45.7	233.3	62.40	0.272	77.20	88.80	0.336	0.383	
1050	1064.7	72.4	4.15	46.3	238.3	63.10	0.275	78.10	90.10	0.340	0.391	
1100	1114.7	75.8	4.23	47.5	248.3	63.80	0.278	79.10	91.10	0.344	0.396	
1150	1164.7	79.2	4.30	48.5	256.8	64.40	0.281	80.15	92.20	0.349	0.401	
1200	1214.7	82.6	4.33	49.0	261.3	65.00	0.283	81.00	93.15	0.353	0.405	
1250	1264.7	86.0	4.42	50.3	272.3	65.60	0.286	82.00	94.30	0.357	0.411	
1300	1314.7	89.4	4.48	51.3	280.8	66.30	0.289	82.90	95.30	0.362	0.416	
1350	1364.7	92.8	4.53	52.0	287.3	66.70	0.291	84.00	96.60	0.366	0.421	
1400	1414.7	96.2	4.58	52.6	293.5	67.00	0.292	84.60	97.30	0.368	0.423	
1450	1464.7	99.6	4.64	53.5	301.5	67.70	0.295	85.30	98.20	0.371	0.426	
1500	1514.7	103.0	4.69	54.3	309.3	68.30	0.298	85.80	98.80	0.374	0.430	
1550	1564.7	106.4	4.74	55.0	317.3	68.80	0.300	86.80	99.85	0.378	0.434	
1600	1614.7	109.8	4.79	55.8	323.3	69.10	0.302	87.60	100.80	0.382	0.438	

Courtesy Ingersoll-Rand Co.

Loss of Pressure in Compressed Air Transmission

The following tables give the drop in pressure per 1,000 feet of pipe, for different deliveries, and pipe sizes from 1 to 16 inch.

Copyright, 1906, by Ingersoll-Rand Company

Delivery in Cu. Ft. of Compressed Air per Min.	Equiv. Delivery in Cu. Ft. of Free Air per Min.	Size of Pipe, Inches																	
		1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	16
		Loss of Pressure, in Pounds, by Friction in 1000 Feet Lengths of Pipe																	
At 60 Pounds Gauge																			
9.84	50	18.24	5.06	1.95	.42	.13	.05												
14.73	75		11.34	4.33	.95	.29	.11	.05											
19.64	100		20.16	7.79	1.69	.52	.19	.08	.04										
24.60	125			12.23	2.65	.81	.30	.13	.07	.03									
29.45	150			17.53	3.80	1.16	.44	.19	.09	.05	.03								
34.44	175				5.17	1.58	.59	.26	.13	.07	.04	.01							
39.35	200				6.77	2.09	.78	.36	.17	.09	.06	.02	.01						
49.20	250				10.61	3.24	1.22	.55	.27	.15	.08	.03	.01						
58.90	300				15.20	4.65	1.78	.78	.38	.21	.12	.05	.02	.01					
68.6	350					6.31	2.37	1.07	.53	.29	.17	.06	.03	.01					
78.6	400					8.28	3.11	1.40	.69	.39	.22	.08	.04	.01					
88.4	450					10.47	3.94	1.77	.88	.48	.28	.11	.05	.02	.01				
98.4	500						4.88	2.20	1.08	.60	.34	.14	.06	.03	.01				
118.1	600						7.03	3.17	1.56	.87	.49	.19	.09	.04	.02	.01			
137.5	700						9.52	4.29	2.12	1.17	.67	.27	.12	.06	.03	.02			
156.6	800							5.57	2.75	1.52	.87	.34	.15	.08	.04	.03	.01		
176.5	900							7.08	3.49	1.94	1.17	.43	.19	.09	.05	.03	.01		
196.4	1000							8.77	4.33	2.40	1.37	.54	.24	.12	.06	.04	.02	.01	
294.5	1500								9.73	5.39	3.08	1.20	.55	.27	.15	.09	.03	.01	
393.7	2000									9.65	5.51	2.16	.98	.41	.27	.16	.06	.03	.01
492	2500										8.61	3.36	1.53	.77	.42	.25	.09	.04	.02
589	3000											4.82	2.19	1.11	.61	.36	.14	.06	.03
686	3500											6.54	2.97	1.50	.83	.48	.19	.09	.04
786	4000												3.91	1.98	1.08	.63	.25	.11	.05
884	4500												4.94	2.51	1.36	.79	.32	.15	.07
984	5000												6.19	3.10	1.69	.99	.39	.18	.09
At 80 Pounds Gauge																			
7.74	50	14.31	3.96	1.53	.33	.10	.03	.01											
11.3	75		8.46	3.26	.71	.21	.08	.03	.01										
15.2	100		15.31	5.92	1.28	.39	.14	.06	.03	.02	.01								
19.4	125			9.64	2.09	.64	.24	.11	.05	.03	.01								
23.2	150			13.79	2.99	.91	.34	.15	.07	.04	.02	.01							
27.2	175				4.09	1.25	.47	.21	.10	.06	.03	.01							
31.0	200				5.34	1.63	.61	.27	.13	.07	.04	.01							
38.7	250				8.32	2.54	.96	.43	.21	.12	.07	.02	.01						
46.5	300				12.01	3.67	1.38	.62	.30	.17	.09	.03	.01						
54.2	350					4.99	1.88	.84	.41	.23	.13	.05	.02	.01					
62.0	400					6.53	2.45	1.11	.54	.30	.17	.06	.03	.01					
69.7	450					8.25	3.13	1.40	.69	.38	.22	.08	.04	.01					
77.4	500					10.81	3.83	1.73	.85	.47	.27	.10	.05	.02	.01				
92.9	600						5.61	2.46	1.22	.68	.39	.15	.06	.03	.02	.01			
108.2	700						7.46	3.37	1.66	.92	.53	.20	.09	.04	.02	.01			
124.0	800						9.86	4.42	2.18	1.19	.69	.27	.12	.06	.03	.02	.01		
139.5	900							5.61	2.77	1.54	.88	.34	.15	.08	.04	.02	.01		
152	1000							6.64	3.29	1.82	1.04	.40	.18	.09	.05	.03	.01		
232	1500							15.41	7.62	4.24	2.43	.95	.43	.22	.12	.06	.02	.01	
310	2000								13.62	7.58	4.32	1.69	.77	.39	.21	.12	.04	.02	.01
387	2500									11.79	6.88	2.64	1.19	.60	.33	.19	.07	.03	.01
465	3000										9.72	3.79	1.73	.87	.48	.28	.11	.05	.02
542	3500										13.25	5.27	2.35	1.19	.65	.37	.15	.06	.03
620	4000											6.78	3.07	1.55	.85	.49	.19	.09	.04
697	4500											8.54	3.89	1.97	1.08	.66	.25	.11	.05
774	5000											10.55	4.79	2.46	1.33	.77	.30	.14	.07

For longer or shorter pipes the friction loss is proportional to the length, *i.e.*, for 500 feet ½ of the above; for 4,000 feet four times the above, etc.

Copyright, 1906, by Ingersoll-Rand Company

Delivery in Cu. Ft. of Compressed Air per Min.	Equiv. Delivery in Cu. Ft. of Free Air per Min.	Size of Pipe, Inches																	
		1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	16
		Loss of Pressure, in Pounds, by Friction in 1000 Feet Lengths of Pipe																	
At 100 Pounds Gauge																			
6.41	50	11.89	3.29	1.28	.27	.08	.03	.01											
9.61	75		7.42	2.87	.62	.19	.07	.03	.01										
12.81	100		13.20	5.11	1.15	.34	.12	.05	.02	.01									
15.81	125			7.75	1.68	.52	.19	.08	.04	.02	.01								
19.22	150			11.42	2.48	.76	.29	.13	.06	.03	.02	.01							
22.39	175				3.36	1.03	.39	.17	.09	.04	.03	.01							
25.62	200				4.43	1.36	.51	.23	.12	.06	.04	.02	.01						
31.62	250				6.72	2.06	.77	.35	.17	.09	.05	.02	.01						
38.44	300				9.95	3.04	1.14	.51	.25	.14	.08	.03	.01						
44.78	350				13.41	4.11	1.54	.69	.34	.19	.11	.04	.02	.01					
51.24	400					5.40	2.06	.92	.45	.25	.15	.05	.03	.01					
57.65	450					6.85	2.57	1.16	.57	.32	.18	.07	.03	.02	.01				
63.24	500					8.21	3.08	1.39	.68	.38	.22	.08	.04	.02	.01				
76.88	600					12.21	4.58	2.14	1.03	.57	.33	.12	.05	.03	.02	.01			
89.56	700						6.19	2.79	1.38	.77	.44	.17	.07	.04	.02	.01			
102.5	800						8.13	3.67	1.81	1.00	.57	.22	.10	.05	.03	.02	.01		
115.3	900						10.23	4.64	2.29	1.27	.76	.28	.13	.06	.04	.02	.01		
126.5	1000						12.39	5.00	2.76	1.23	.88	.34	.16	.08	.04	.03	.01		
192.2	1500							12.81	6.68	3.51	2.03	.78	.36	.18	.09	.05	.02	.01	
256.2	2000								11.35	6.61	3.62	1.41	.67	.33	.18	.10	.04	.02	.01
316.2	2500									9.50	5.51	2.14	.97	.49	.27	.16	.06	.03	.01
384.4	3000									14.04	8.11	3.16	1.44	.76	.39	.23	.19	.04	.02
447.8	3500										10.95	4.26	1.93	.98	.53	.31	.12	.05	.03
512.4	4000										14.48	5.59	2.55	1.30	.72	.41	.16	.07	.04
576.5	4500											7.04	3.22	1.84	.89	.52	.21	.09	.05
632.4	5000											8.51	3.88	1.93	1.07	.63	.25	.11	.08
At 125 Pounds Gauge																			
5.26	50	9.88	2.70	1.05	.23	.07	.03	.01											
7.89	75	22.20	6.07	2.37	.51	.16	.06	.03	.01										
10.51	100	39.50	10.82	4.22	.91	.28	.10	.05	.02	.01									
13.15	125		16.88	6.58	1.42	.43	.16	.07	.04	.02	.01								
15.79	150		24.33	9.47	2.04	.63	.23	.11	.05	.03	.02	.01							
18.41	175		33.05	12.90	2.78	.85	.32	.14	.07	.04	.02	.01							
21.05	200			16.84	3.63	1.11	.42	.19	.09	.05	.03	.01							
26.30	250			26.30	5.68	1.73	.65	.29	.15	.08	.05	.02	.01						
31.58	300			37.90	8.18	2.51	.94	.42	.21	.12	.07	.03	.01						
36.81	350				11.08	3.39	1.27	.58	.28	.16	.09	.04	.02	.01					
42.10	400				14.51	4.44	1.67	.75	.37	.21	.12	.05	.02	.01					
47.30	450				18.38	5.61	2.11	.95	.47	.26	.15	.06	.03	.01	.01				
52.60	500				22.68	6.95	2.61	1.18	.58	.32	.18	.07	.03	.02	.01				
63.20	600					10.00	3.76	1.69	.84	.46	.27	.10	.05	.02	.01	.01			
73.70	700					13.60	5.11	2.31	1.14	.63	.36	.14	.06	.03	.02	.01			
84.20	800					17.80	6.68	3.01	1.49	.83	.47	.18	.08	.04	.02	.01	.01		
94.70	900						8.45	3.81	1.88	1.04	.60	.23	.11	.05	.03	.02	.01		
105.1	1000						10.42	4.71	2.32	1.29	.74	.29	.13	.07	.04	.02	.01		
157.9	1500						23.48	10.59	5.23	2.90	1.65	.64	.29	.15	.08	.05	.02	.01	
210.5	2000							18.81	9.30	5.15	2.94	1.15	.52	.26	.15	.08	.03	.02	.01
263.0	2500							29.40	14.52	8.05	4.60	1.80	.82	.41	.23	.13	.05	.02	.01
315.8	3000								20.90	11.59	6.63	2.59	1.18	.60	.33	.19	.07	.03	.02
368.1	3500								28.51	15.78	9.01	3.53	1.61	.81	.45	.26	.10	.04	.02
422.0	4000									20.61	11.80	4.61	2.19	1.06	.58	.34	.13	.06	.03
473.0	4500									26.10	14.90	5.83	2.65	1.34	.73	.43	.17	.08	.04
526.0	5000									32.20	18.45	7.20	3.27	1.65	.90	.53	.21	.10	.05

For longer or shorter pipes the friction loss is proportional to the length, *i.e.*, for 500 feet ½ of the above; for 4,000 feet four times the above, etc.

DISCHARGE OF AIR THROUGH AN ORIFICE

IN CUBIC FEET OF FREE AIR PER MINUTE

Flowing From a Round Hole in Receiver Into the Atmosphere

Copyrighted, 1906, by Ingersoll-Rand Company.

Receiver Gauge Pressure Pounds	Diameter of Orifice													
	1/64 inch	1/32 inch	1/16 inch	⅛ inch	¼ inch	⅜ inch	½ inch	⅝ inch	¾ inch	⅞ inch	1 inch	1¼ inch	1½ inch	2 inch
	Discharge in Cubic Feet of Free Air per Minute													
2	.038	.153	.647	2.435	9.74	21.95	39.	61	87.60	119.50	156	242.	350.	625
5	.0597	.242	965	3.86	15.40	34.60	61.60	96 50	133.	189.	247.	384.	550.	985
10	.0842	.342	.136	5.45	21.8	49.	.87.	136.	196	267.	350	543.	780.	. .
15	.103	.418	1.67	6.65	26.70	60.	107.	167	240	326	427	665.	960	.
20	.119	.485	1.93	7.7	30.8	69	123	193	277	378	494	770		.
25	.133	.54	2.16	8.6	34.5	77	138	216	310	422	550.	860.		.
30	.156	.632	2.52	10.	40	90	161	252	362.	493.	645	1000.		
35	.173	.71	2.80	11 2	44 7	100	179	280	400	550.	715	. . ..	....	
40	.19	.77	3.07	12 27	49 09	110 45	196 35	306.80	441 79	601.32	785.40	....	....	
45	.208	.843	3.36	13.4	53.8	121	215	336	482.	658.	860	....	....	
50	.225	.914	3.64	14 50	58.2	130.	232	364.	522	710.	930.	....	...	.
60	.26	1.05	4.2	16.8	67	151	268	420	604.	622	. . ..	....		
70	.295	1 19	4.76	19.	76.	171.	304.	476.	685.	930.	....	. ...		
80	33	1 33	5.32	21.2	85.	191	340	532	765.	1004.	....	... .	....	....
90	.364	1.47	5.87	23 50	94	211	376.	587	843.	... .	.....	. .		.
100	40	1 61	6.45	25.8	103.	231.	412.	645	925.	....	....	....		
125	.486	1.97	7.85	31.4	125.	282.	502	785	.. .. . .	....	....	....	.	

Cubic Feet of Free Air

Required to Run One Drill of Size and at the Pressure Stated Below.

Gauge Pressure Lbs	Cylinder Diameter of Drill												
	2"	2¼"	2½"	2¾"	3"	3⅛"	3 3/16"	3¼"	3½"	3⅝"	4¼"	5"	5½"
60	50	60	68	82	90	95	97	100	108	113	130	150	164
70	56	68	77	93	102	108	110	113	124	129	147	170	181
80	63	76	86	104	114	120	123	127	131	143	164	190	207
90	70	84	95	115	126	133	136	141	152	159	182	210	230
100	77	92	104	126	138	146	149	154	166	174	199	240	252

Multipliers to Determine Capacity of Compressor

Required to Operate from 1 to 70 Rock Drills at Altitudes Compared with Sea Level

Altitude Above Sea Level Feet	Number of Drills																		
	1	2	3	4	5	6	7	8	9	10	12	15	20	25	30	40	50	60	70
	Multipliers																		
0	1.	1.8	2.7	3.4	4.1	4.8	5.4	6.0	6.5	7.1	8.1	9.5	11.7	13.7	15 8	21.4	25 5	29.4	33.2
1000	1.03	1.85	2.78	3.5	4.22	4.94	5.56	6.18	6.69	7.3	8.34	9.78	12.05	14.1	16 3	22.0	26.26	30 3	34 2
2000	1.07	1.92	2.89	3.64	4.39	5.14	5.78	6.42	6.95	7.60	8.67	10.17	12.52	14 66	16.9	22.9	27.28	31.46	35 52
3000	1.10	1.98	2.97	3.74	4.51	5.28	5.94	6.6	7.15	7.81	8.91	10.45	12.87	15.07	17 38	23.54	28 05	32.34	36 52
4000	1.14	2.05	3.08	3.88	4.67	5.47	6 15	6.84	7.41	8.09	9.23	10.83	13.34	15.62	18.01	24.4	29.07	33 52	37 8
5000	1.17	2.10	3.16	3.98	4.8	5.62	6.32	7.02	7.61	8 31	9.48	11.12	13 69	16 03	18 49	25 04	29.84	34.4	38 84
6000	1.20	2.16	3.24	4.08	4.9	5.76	6.48	7.2	7.8	8.52	9.72	11.4	14.04	16 44	18 96	25 68	30 6	35.4	39 84
7000	1.23	2 21	3.32	4.18	5 04	5.9	6.64	7.38	7 99	8.73	9.96	11.68	14.39	16 85	19 43	26.32	31.36	36.16	40 84
8000	1.26	2.27	3.40	4.28	5.17	6.05	6.8	7.56	8 19	8.95	10.21	11.97	14.74	17.26	19 9	29 96	32.13	37.04	41.83
9000	1.29	2.32	3.48	4.39	5.29	6.19	6.96	7.74	8 38	9.16	10.45	12.26	15 09	17 67	20 38	27.6	32.9	37.92	42 83
10000	1.32	2.38	3.56	4.49	5.41	6.34	7.13	7.92	8.58	9.37	10.69	12.54	15.44	18.08	20 86	28.25	33.66	38.8	43 82
12000	1.37	2.47	3.70	4.66	5.62	6.57	7.4	8.22	8.9	9 73	11.1	13.02	16 03	18.77	21 64	29.32	34.94	40.28	45.48
15000	1.43	2.57	3.86	4.86	5.86	6.86	7.72	8.58	9.3	10.15	11.58	13.58	16 73	19.59	22.59	30.6	36.46	42.04	47.47

EXAMPLE—Required the amount of free air necessary to operate thirty 5-inch drills at 9,000 feet altitude, using to operate these drills air at a gauge pressure of 80 pounds per square inch.

From Table above we find, when operating the drills at 80 pounds gauge pressure at sea level, that one 5-inch drill requires 190 cubic feet of free air per minute.

From Table opposite we also find that the factor for 30 drills at 9.000 feet altitude is 20.38; multiplying 190 cubic feet by 20.38 gives 3,872 cubic feet free air per minute, which is the displacement of a compressor for the above outfit under average conditions, to which must be added pipe line losses, such as friction and leakage

Mechanical, Electrical and Heat Equivalents

1 H. P. =
746 watts.
0.746 K. W.
33,000 ft.-lbs. per minute.
550 ft.-lbs. per second.
2,545 heat-units per hour.
42.4 heat-units per minute.
0.707 heat unit per second.
0.175 lb. carbon oxidized per hour.
2.64 lbs. water evaporated per hour from and at 212° F.

1 Kilowatt =
1,000 watts
1.34 horse-power.
2,654,200 ft.-lbs. per hour.
44,240 ft.-lbs. per minute.
737.3 ft.-lbs. per second.
3,412 heat-units per hour.
56.9 heat-units per minute.
0.948 heat-unit per second.
0.2275 lb. carbon oxidized per hour.
3.53 lbs. water evaporated per hour from and at 212° F.

1 Watt =
1 joule per second.
0.00134 H. P.
3.412 heat-units per hour.
0.7373 ft.-lb. per second.
0.0055 lb. water evaporated per hour.
44.24 ft.-lbs. per minute.

1 H. P. Hour =
0.746 K. W. hours.
1,980,000 ft.-lbs.
2,545 heat-units.
273,740 k. g. m.
0.175 lb. carbon oxidized with perfect efficiency.
2.64 lbs. water evaporated from and at 212° F.
17.0 lbs. water raised from 62° F. to 212° F.

1 K. W. Hour =
1,000 watt hours.
1.34 horse-power hours.
2,654,200 ft.-lbs.
3,600,000 joules.
3,412 heat units.
367,000 kilogram meters.
0.235 lb. carbon oxidized with perfect efficiency.
3.53 lbs. water evaporated from and at 212° F.
22.75 lbs. of water raised from 62° to 212° F.

1 Ft-lb. =
1,356 joules.
0.1383 k. g. m.
0.000000377 K. W. hours.
0.001285 heat-units.
0.0000005 H. P. hour.

Horse Power of Double Acting, Single Cylinder Steam Engines:

$$HP=\frac{P\times L\times A\times N\times F}{33000}$$

P = Gauge pressure at engine.
L = Length of stroke in feet.
A = Area of piston in square in.
N = Number of strokes per min.
F = Factor of cut-off.
= .599 for ¼ cut-off.
= .670 for 1-3 cut off.

HORSE POWER DEVELOPED TO COMPRESS 100 CUBIC FEET FREE AIR FROM ATMOSPHERE TO VARIOUS PRESSURES

Gauge pressure, pounds	One-stage compression D. H. P.	Gauge pressure, pounds	ASSUMING PERFECT COOLING BETWEEN STAGES		
			Two-stage compression D. H. P.	Three-stage compression D. H. P.	Four-stage compression D. H. P.
5	1.96	60	11.70	11.20	10.80
10	3.60	70	12.70	12.00	11.70
15	5.03	80	13.70	13.00	12.50
20	6.28	90	14.70	14.00	13.50
25	7.42	100	15.40	14.50	14.20
30	8.47	125	17.50	16.00	15.60
35	9.42	150	19.00	17.50	16.70
40	10.30	200	21.20	19.50	18.75
45	11.14	300	24.50	22.90	21.80
50	11.90	400	27.70	25.70	24.00
55	12.67	500	29.75	27.60	25.90
60	13.41	600	31.70	29.20	27.50
70	14.72	700	33.50	30.60	28.90
75	15.37	800	34.90	31.80	30.00
80	15.94	900	36.30	32.90	31.00
85	16.50	1000	37.80	33.80	31.80
90	17.06	1200	39.70	35.50	33.30
100	18.15	1400	41.60	36.80	34.60
150	24.00	1600	43.00	38.10	35.65
200	26.20	1800	44.50	39.30	36.70
400	36.00	2000	45.50	40.60	37.80
...	.....	2500	.....	.....	39.06
...	.....	3000	.....	.....	40.15

An addition of 10 to 15 per cent. should be made for friction and intake temperature higher than 60 degrees Fahrenheit, on which this table is based. Atmospheric pressure is assumed at 14.7 pounds per square inch. No account taken of jacket cooling.

Courtsey H. K. Porter Co.

Cost of Fuel per Boiler Horse Power (30 lbs. per hour) per year of 365 24-hour days.

Cost of Coal per Ton 2,000 lbs.	Pounds of Water evaporated per Pound of Fuel.				
	6	7	8	9	10
.25	5.47	4.63	4.10	3.64	3.28
.50	10.94	9.37	8.21	7.28	6.58
.75	16.41	14.05	12.31	10.92	9.84
1.00	21.90	18.74	16.42	14.58	13.14
1.25	27.37	23.42	20.52	18.22	16.42
1.50	32.84	28.11	24.61	21.86	19.70
1.75	38.31	32.79	28.71	25.50	22.98
2.00	43.80	37.48	32.84	29.16	26.28
2.50	54.74	46.85	41.05	36.44	32.84
3.00	65.70	56.22	49.26	43.74	39.42
4.00	87.60	74.96	65.68	58.32	52.56
5.00	101.50	93.70	82.10	72.90	65.70

HORSE POWER TRANSMITTED BY LEATHER BELTS

(A) Single Belts 1 Inch Wide, 800 Feet Per Minute—1 Horse-Power

Speed in Feet per Minute	WIDTH OF BELT IN INCHES											
	2	3	4	5	6	8	10	12	14	16	18	20
	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.
400	1	1½	2	2½	3	4	5	6	7	8	9	10
600	1½	2¼	3	3¾	4½	6	7½	9	10½	12	13½	15
800	2	3	4	5	6	8	10	12	14	16	18	20
1000	2½	3¾	5	6¼	7½	10	12½	15	17½	20	22½	25
1200	3	4½	6	7½	9	12	15	18	21	24	27	30
1500	3¾	5¾	7½	9½	11½	15	18¾	22½	26½	30	33¾	37
1800	4½	6¾	9	11¼	13½	18	22½	27	31½	36	40½	45
2000	5	7½	10	12½	15	20	25	30	35	40	45	50
2400	6	9	12	15	18	24	30	36	42	48	54	60
2800	7	10½	14	17½	21	28	35	42	49	56	63	70
3000	7½	11¼	15	18¾	22½	30	37½	45	52½	60	67½	75
3500	8¾	13	17½	22	26	35	44	52½	61	70	79	88
4000	10	15	20	25	30	40	50	60	70	80	90	100
4500	11¼	17	22½	28	34	45	57	69	78	90	102	114
5000	12½	19	25	31	37½	50	62½	75	87½	100	112	125

HORSE POWER TRANSMITTED BY LEATHER BELTS—CONTINUED

(B) Double Belts 1 Inch Wide, 550 Feet Per Minute—1 Horse-Power

Speed in Feet Per Minute	WIDTH OF BELT IN INCHES										
	4	6	8	10	12	14	16	18	20	22	24
	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.
400	2¾	4¼	5¾	7¼	8½	10	11½	13	14½	16	17½
600	4¼	6½	8¾	11	13	15	17½	19½	22	24	26
800	5¾	8½	11½	14½	17½	20½	23	26	29	32	34½
1000	7¼	11	14½	18¼	21½	25½	29	32½	36	40	43½
1200	8½	13	17½	22	26	30¼	34½	39	44	48	52½
1500	10¾	16¼	21¾	27¼	32½	38	43½	49	54½	60	65½
1800	13	19½	26	32¾	39	45½	52	59	65½	72	78½
2000	14½	21¾	29	36½	43½	50½	58	65½	72½	80	87
2400	17¼	26	34¾	44	52½	60½	69½	78½	88	96	105
2800	20¼	30½	40½	51	61	71	81	91½	102	112	122
3000	21½	32½	43½	54½	65½	76	87½	98	108	120	131
3500	25½	38	50¾	63½	76	89	101	114	127	140	153
4000	29	43½	58¼	72¾	87	101	116	131	147	160	174
4500	32½	49	65	82	98	114	131	147	163	180	196
5000	36½	54½	72¾	91	109	127	145	163	182	200	218

N. B.—Belts are supposed to be not overstrained, so they will last.

THE BROWNELL COMPANY.

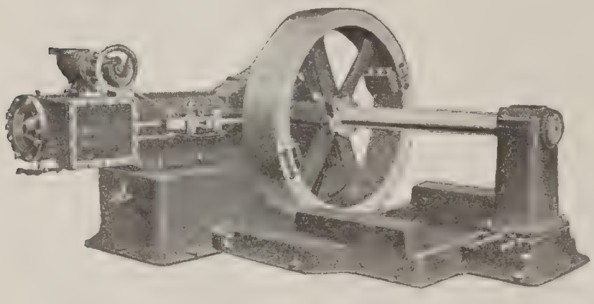
DAYTON, OHIO.

Manufacturers of

Engines, Boilers & Feed Water Heaters

This engine is suitable for direct connection to generators, both direct and alternating current.

It can also be furnished for belted service.

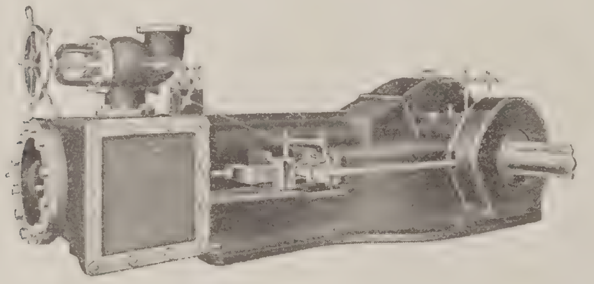


Enclosed Self Oiling Automatic Engine
60 to 320 H. P.

The construction is very simple and the cost, of course, is less than the Corliss type of engine.

This engine is reliable and has given most excellent service.

We have installed fan engines in mines throughout the country, and their ability to stand up under severe and continuous service has resulted in our receiving nemerous repeat orders.



Enclosed Self Oiling Fan Engine
60 to 300 H. P.

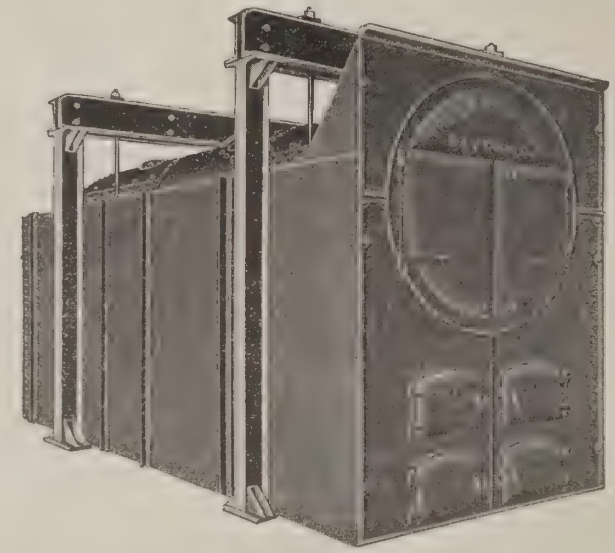
We furnish this engine either direct connected or belted to fan.

If desired, we can furnish with the engine an adjustable cut off operated by hand, making it possible to get a cut off varying from 0 to 75% without materially disturbing the other events of stroke.

When fuel economy and floor space are points of consideration we recommend the steel casing setting in connection with our Horizontal Tubular Boilers.

The type of setting shown below permits the installation of boilers in places where otherwise it would be impossible.

The saving in fuel is a considerable item, and the cost of maintenance is reduced.

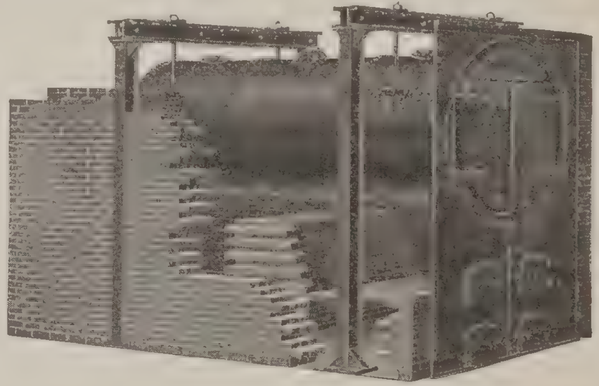


Horizontal Return Tubular Boiler. Standard Box Type Steel Casing Setting.

It also improves the appearance of the boiler room.

We build Horizontal Tubular Boilers in sizes from 15 to 250 horse power.

The working pressures vary from 100 to 150 pounds.



Horizontal Return Tubular Boiler, Bricked In, Suspended or Gallows Frame Setting.

This type of boiler is also built with six inch flues.

Write us for details or information regarding other types of boilers.

CHANDLER AND TAYLOR CO.

Works

INDIANAPOLIS, IND.

NEW YORK
John Kilshaw, 39-41 Cortland St.

CHICAGO
C. S. Buell, 1641 Monadnock Bldg.

Products

Steam Engines, Fan Engines, Steam Boilers, and Firebox Boilers.

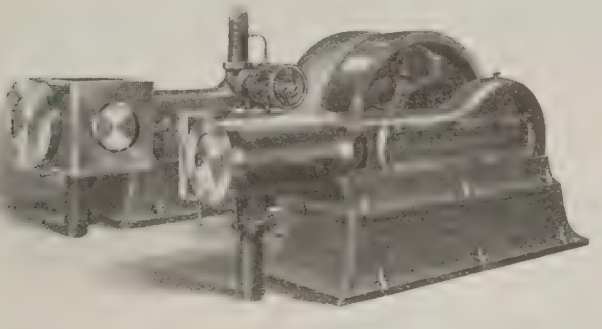
Steam Engines

Single Throttling, 15 to 250 H. P.
Twin Throttling, 30 to 500 H. P.
Single Direct Connected, 25 to 300 K. W.
Tandem Compound, 25 to 300 K. W.
Cross Compound, 50 to 500 K. W.

Fan Engines

Open and Enclosed types from 15 to 500 H. P. Speeds 300 to 175 R. P. M. With or without Hand Cut Off Device.

Our large line of types and sizes permits us to select engines for any steam pressure, any degree of superheat, and for any speed which your particular conditiions might require.



Cross Compound.

Our Piston Valves give wonderful economy over long periods, because they stay steam tight. See guarantee below.

Direct Connected Engines

Simple, Tandem and Cross Compound Engines are all Enclosed and Self Oiling.

These are all made to fit any of the standard Electric Generators on the market.

We guarantee our Valves to operate steam tight for five years.

Steam Boilers

Stationary Tubular, 15 to 250 H. P.
Pressures, 100 to 150 lbs.
Carried in stock.
Set Singly or in Batteries.
With or without Steel Casings.
Fronts to fit any Standard Stokers.
Dutch Oven Settings.
Breechings.
Stacks.

Firebox Boilers

Boiler In Brick Setting.

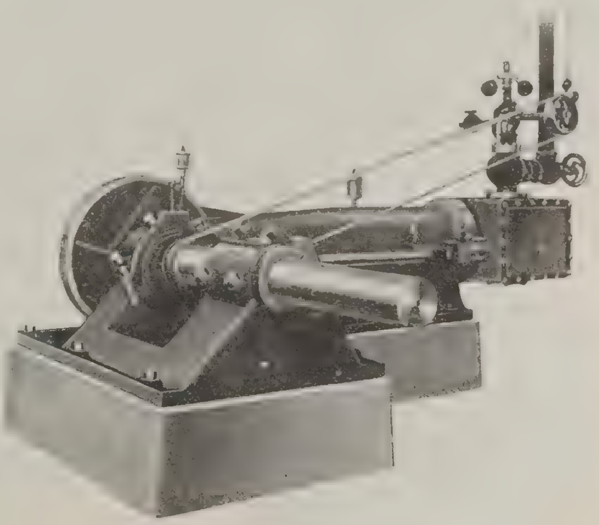
Boilers

Are all built with a factor of safety of five and contain tubes made by the "Spellerized Process," which U. S. Government reports show, are better than tubes made of charcoal iron.

This is a distinct advantage in boilers used in Mine Service. Some of the biggest operators are using our tubes.

Fan Engines

Are made with Hand Cut-Off Device when desired, and of either the Open or Enclosed type.



Open Type Fan Engine.

The S. Freeman & Sons Mfg. Company

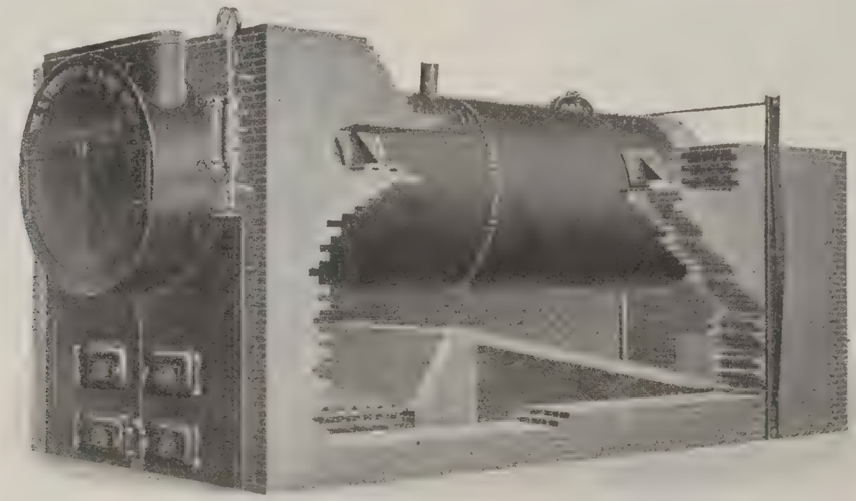
Chicago Office---Monadnock Building
MAIN OFFICE--RACINE, WISCONSIN

Manufacturers of

Tubular Boilers

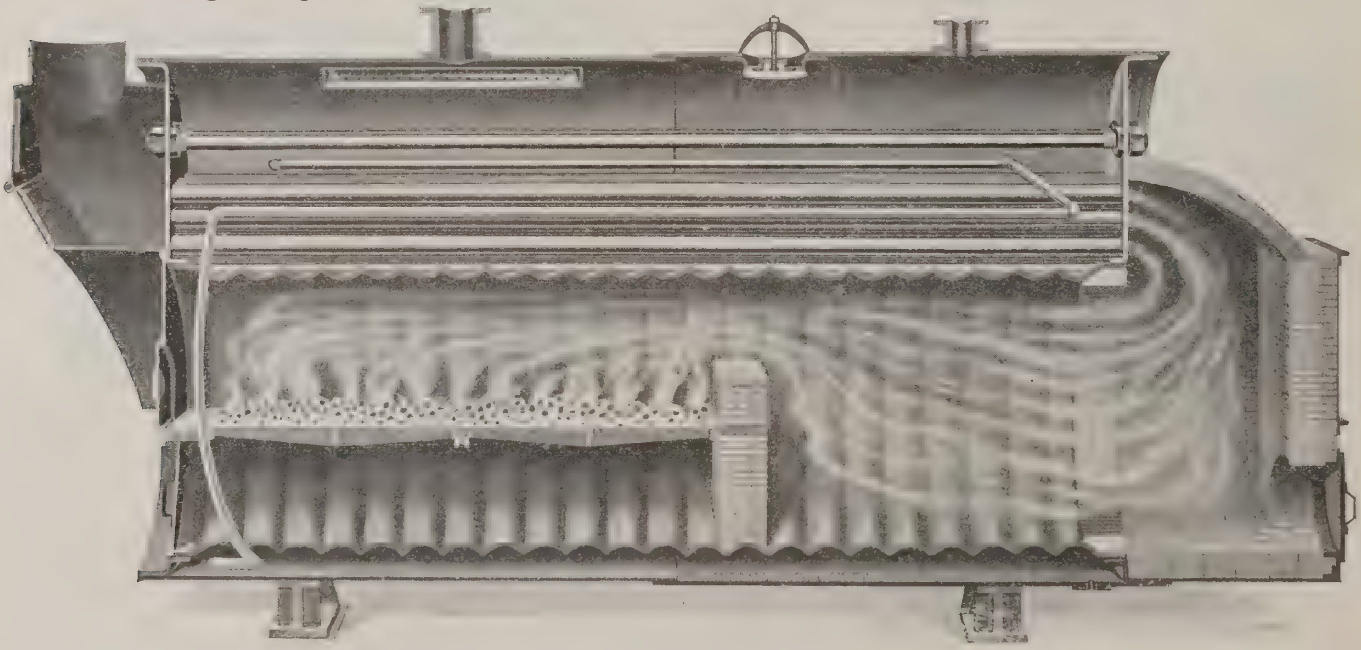
Freeman High Pressure Tubular Boiler

Made from the very best materials that money can buy and their construction the best consistent with modern tools and methods. We would gladly submit estimates on your requirements.



Freeman Internally Fired Return Tube Boiler.

Our type of Internally Fired Boiler is the most compact and efficient boiler that can be designed. Brick work is eliminated, and as it is a self-contained boiler all the heat units are utilized without waste. We can design this type of boiler to meet the requirements of the space it is to occupy. Send for Catalogs and prices.

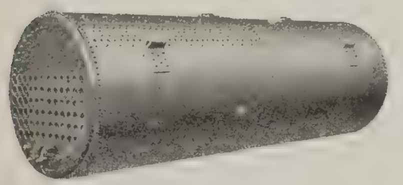


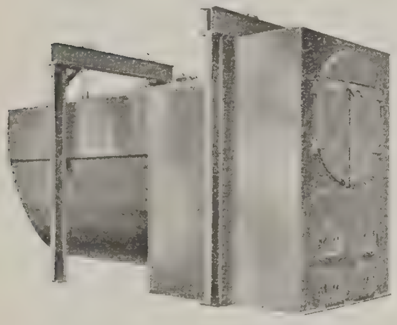
The Houston, Stanwood & Gamble Co.

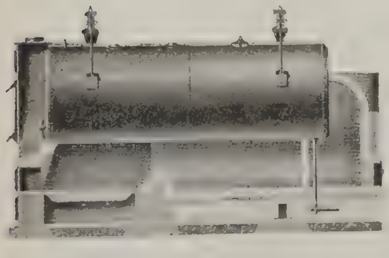
CINCINNATI, OHIO

Products

Horizontal Tubular Boilers, Steel Casing Boiler Settings, Locomotive Fire Box Boilers, Feed Water Heaters, Stacks, Heavy Tanks, Grate Bars, Boiler Castings, Steam Engines, both of shaft governor and throttling governor types, and of both open and enclosed, automatically oiling types; Hoisting Engines, Fan Engines, Haulage Engines, Screen Engines, Dynamo Engines.


High Pressure, Butt Joint H. T. Boiler.


Steel Casing Setting for H. T. Boiler.


Sectional View of Steel Casing Setting.

High Pressure Locomotive Fire Box Boiler.

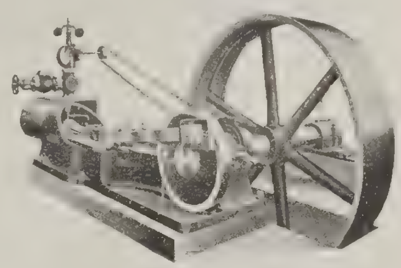
Horizontal Tubular Boilers are built in all sizes up to 84 x 20-250 H. P., the most popular sizes, taking both first cost per H. P. and operating efficiency into consideration, being the 72-inch, 78-inch and 84-inch diameters in the 18 and 20 feet lengths. The American Society of Mechanical Engineers' Boiler Code Specifications are recommended by us to prospective purchasers. The moderate extra cost of boilers built to these specifications is more than justified by the greater safety and durability of the A. S. M. E. code boiler.

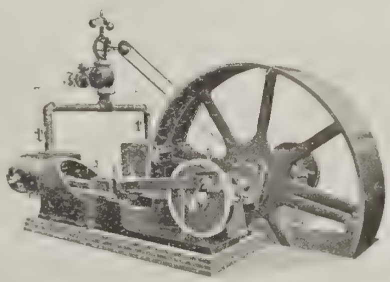
Our Steel Casing Setting with the Catenary-shaped combustion chamber is an efficient design of the steel casing setting, which it is generally recognized, avoids setting repairs, also saves coal through almost eliminating the leakage of air into the setting. We build steel casings in a wide variety of designs and have installations in almost every locality.

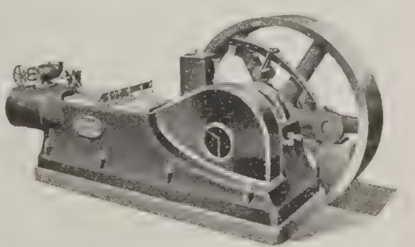
In addition to the open type Feed Water Heater illustrated, we build a number of designs of closed heaters.

Our enclosed type engine is built with shaft governor, with throttling governor, also with hand adjustable variable cut-off, and as all parts, even the valve gear, are completely enclosed, is particularly well suited to coal mine service. It is used for fans, dynamos, and general power service in sizes from 60 to 300 H. P. Our open type engines are used for all kinds of service for which the enclosed engines are employed, also have been used frequently for driving crushers, shaking screens, haulage equipment, for hoisting, etc., etc.

"Universal" Improved Open Feed Water Heater, Purifier, Filter and Oil Separator.


Heavy Duty Side Crank Throttling Engine.


Twin Engine for Haulage or for General Power Purposes.


Completely Enclosed, Automatically Oiling, Shaft Governor Engine for Belted Dynamo Drive or for General Power Purposes.

ESTABLISHED 1864

E. KEELER COMPANY

WILLIAMSPORT, PA.

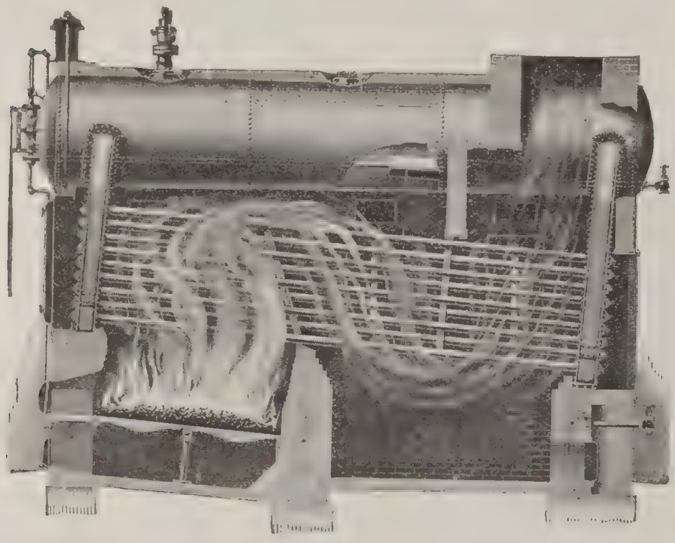
NEW YORK BOSTON PHILADELPHIA PITTSBURGH RICHMOND, VA. CHICAGO

MANUFACTURERS OF

Water Tube and Return Tubular Boilers, Stacks, Etc.

Keeler Water Tube Boilers

Built in units from sixty to twelve hundred fifty horse power, wrought steel construction througout. Straight tubes, horizontal drums, vertical baffle walls, rear casing.



Every portion of the heating surface is accessible for both external and internal inspection, making it impossible for soot or scale to accumulate undetected. Special side cleaning doors make it possible to observe the condition of the outside surface of the tubes. There is no part of the internal surface that cannot be examined and cleaned.

The facility with which a straight tube is cleaned and, if necessary, replaced is only one of its obvious advantages. When the water contains scale-forming substances the use of a straight tube is almost imperative.

The superior efficiency of the Keeler Boiler rests upon correct proportion of heating and grate surface for the character of fuel to be burned, ample height of furnace, superior arrangement of baffle walls and a perfect circulation.

Our Water Tube Boilers are in use by the United States Government (five thousand horse power being used on the Panama Canal), Pennsylvania R. R. Co., New York Central R. R. Co., Buffalo, Rochester & Pittsburg R. R. Co., and in many Pennsylvania, West Virginia and Ohio coal mines.

It is cheaper to invest a trifle extra in first cost rather than to inherit later repair bills.

For fifty-two years we have been building boilers, during that time our shop has never been shut down, and we have never known of a Keeler Boiler exploding.

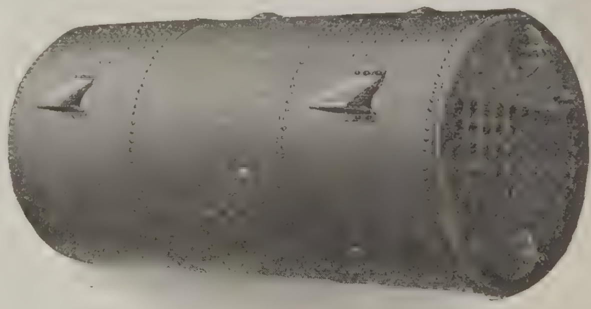
Our new illustrated catalogue furnished on request.

Keeler Return Tubual Boilers

Have a reputation for high quality of fifty-two years' growth. Rivet holes are made 3-16" small and after boiler plates are assembled the holes are drilled to size. This insures perfect alignment. All burs are removed before riveting, tube holes are drilled from the solid plate and not punched small and reamed to size. The holes are slightly countersunk on the outside. This eliminates the possibility of the sharp edge cutting the tube when beading it. All seams are thoroughly caulked on the outside, and the ends of butt straps are caulked on the inside. All plates are full thickness on the edge and not ordered to weight. Braces are drop forged; trimmings, including steam-outlets, man-hole plates, yokes and brackets, are all of pressed steel. Besides being stronger than cast iron they are of known quality. Cast iron is unsatisfactory for pressure parts; it frequently has sand or air holes which cannot be detected by surface inspection.

A steam separator is located inside of the boiler shell at the steam outlet. This insures dry steam and prevents water entering steam pipe and engine cylinder. An internal feed pipe enters the boiler through the front head at one side, extends nearly the length of the shell, crosses over to the center and discharges through an elbow looking down.

The chief difference in boilers today is in the attention given to details. This is why one boiler costs more than another where specifications are practically the same. The cost of the boiler itself is a small part of your total cost. A cheaply constructed tubular boiler may have to be removed in a short time and you will have to charge off as a total loss money spent for freight, hauling, labor, brick setting and stack erection. The amount of money saved in buying what is known as a competition boiler generally proves to be an unwarranted risk. A Keeler boiler will never be auything but the best that our resources and fifty-two years of experience can produce.



Ask for our book—"Boiler Facts."

UNION IRON WORKS,

Cascade Street, ERIE, PA.

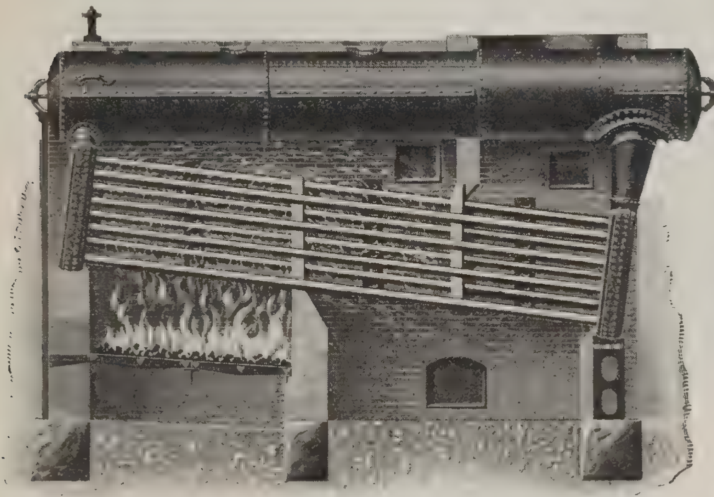
MANUFACTURERS OF STEAM BOILERS.

Branch Offices: Cleveland, New York, Pittsburgh, Philadelphia.

Union Water Tube Boilers.

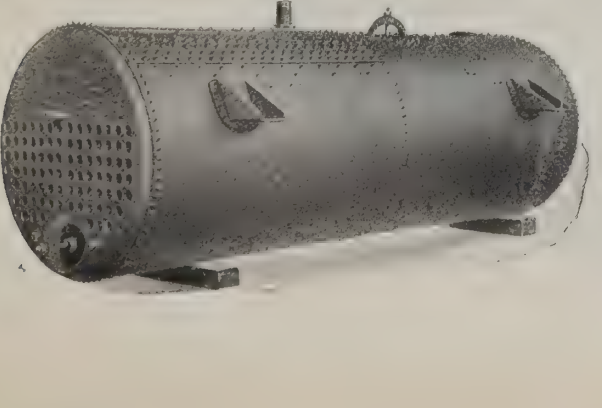
Built in sizes ranging from 100 to 500 Horse-power—and for any pressure up to 200 pounds.

Pressed steel pear-shaped handhole plates, one opposite each tube. Patented corrugated connections between the headers and the drums, which provide ample space for an unrestricted circulation, and yet give a flexibility to the joint. Patented feed-water delivery, whereby over 50 per cent of the sediment is deposited and removed, before passing into the boiler proper. Features of the "Union" Boiler: Perfect Combustion—Economy of fuel, space, and maintenance—Perfect Circulation—Dry Steam—Elasticity—Steady Water Level—Accessibility—Durability.



Union Return Tubular Boilers.

For working pressure 100 to 150 pounds. Built in sizes up to 225 Horse-power. Constructed in strict accordance with any special state laws, and under the inspecion of the Hartford Steam Boiler & Insurance Co. Specially adapted for coal mine use, and widely known throughout the coal regions. The following partial list, of installations by coal companies, amounting to over one thousand boilers, should be sufficient assurance of the quality and reliability of "Union" Boilers. Practically all of these boilers are 72"x18" return tubulars.



Coal Mine Installations.

United C & C Co..... Meadowlands, Pa
Imp. Colliery Co. .. Paint Creek, W. Va.
Carbon Coal Co. ..... Coalburg, W. Va.
Morris & Guild Co. .... Kings Mine, O.
W. Va. Colliery Co. ... Coalburg, W. Va.
Norris Mfg. & Mining Co. New Salisbury, O.
Pittsburg Coal Co. .. Fayette City, Pa.
Dry Branch Coal Co. .. Coalburg, W. Va.
United C. & C. Co. . Meadow Lands, Pa.
Harvey C. & C. Co. ... Harvey, W Va.
Glens Run C. Co. .... Dillinvale, O.
K. & H. Coal & Coke Co. Mammoth, W. Va.
Beech Creek C. & C. Co., Winburne, Pa.
Pgh. & Buffalo Co. .... Bruce, Pa.
Pgh. & Buffalo Co. .... Anderson, Pa.
Missouri City C. Co.....Missouri City, Mo.
Dunkirk Coal Co. .... Frey Sta., Pa.
Naomi Coal Co. .... Fayette City, Pa.
Great Lakes Coal Co.,.. Karns City, Pa.
Bell Creek Min. & Mfg. Co. Belva, W. Va.
Winifred Coal Co. .... Wifinred, W. Va.
Cabin Creek Mining Co. .... Acme, W. Va.
Schoenberger Coal Co. .... Baird, Pa.
Manf'rs Coal & Coke Co... Novinger, Mo.
Akron Coal Co. .... Klondyke Mine, O.
Unitel States Coal Co... Dillonvale, Pa.
Turkey Gap C. & C. Co... Ennis, W. Va.
Cook Coal & Coke Co. Meadowbrook, W. Va.
McNab oal Co. .... Salem, O.
Fremont-Yarpan Co. .... Fremont, O.
Morris & Guild Co. .... Cambridge, O.
Collins Coal Co. ...... Ehrmandale, Ind.
Naomi Coal Co. .... Naomi, Pa.
Leewood Collierp Co. .. Leewood, W. Va.
Belleclaire C. Co. .... Leewood, W. Va.
Neff Coal Mining Co. St. Clairsville Jct. O.
Mt. Carmel C. & C. Co. .. Belva, W. Va.
Buckeye Coal Mining Co. ..Flushing, O.
Somerset Coal Co. .. Elk Lick Mines, Pa.
Somerset Coal Co. Wilson Creek Mine, Pa.
Mecca C. & C. Co... Montgomery, W. Va.
Republic Coal Co. ..... Carbon, W. Va.
Trace-Hamilton C. M. Co.... Zaleski, O.
Austen C. & C. Co. .... Austen, W. Va.
Raccoon Val. C. Co. .. Trauged Sta. Pa.
H. C. Frick Coke Co... Trauger Sta. Pa.
Northern Fuel Co...... Jacksonville, O.
Great Lakes Coal Co... Queen Jctn., Pa.
Rainbow Coal Mining Co., Caledonia, Ind.
Neff Coal Mining Co.. St. Clairsville, O.
Glens Run Coal Co. .... Rush Run, O.
Forsythe Coal Co..... Mineral Siding, O.
Neff Coal Mining Co... St. Clairsville, O.
Great Lakes C. Co..... Queen Jctn., Pa.
Weaver Coal & Coke Co..... Warnock, O.
Belleclaire Coal Co. .... Decota, W. Va.
XL Coal Co. .... Bergholz, O.
U. S. Coal Co. .... Dillonvale, O.
United Coal Co. ...... Decota, W. Va.
Black Diamond C. & M. Co. Drakesboro Ky.
Flubart C. & M. Co. .... Wellston, O.
Great Lakes C. Co. .... Queen Jctn, Pa.
A. Gibbs Coal Co. .... Shawnee, O.
Summit Coal Co............Flushing, O.
Rainbow C. anl M. Co. Caledonia, Ind.
Cornelia Mining Co..........Wellston, O.
H. C. Frick Coke Co. Darent Station, Pa.
Jobs O. H. Coal Co......... Shawnee, O.
Lake Erie Gas C. & C. Co. Burgettstown, Pa.
Raven Coal and Coke Co. Greendale, W.Va.
Hughes Creek C. Co. .. Mitchell, W. Va.
Northern Fuel Co. .... Jacksonville, O.
Dorfee Coal Mining Co. .. Dorfee, W. Va.
Lake Erie G. C. & C. Co. Burgettstown, Pa.
Lake Erie G. C. & C. Co. . Braznell, Pa.
England & Johnson C. C. ..McKitrick, O.
Morris Coal Co. .... Cambridge, O.
Great Lakes C. Co. .... Kaylor, Pa.
Otter Creek Coal Co. .... Diamond, Ind.
Lucas-Ray C. Co. .... Turner, W. Va.
O. & N. W. C. M. Co.,.... Cambridge, O.
New Eng. Coal Co. ..... San Toy, O.
Caledonia Coal & C. Co., Leewood, W. Va.
Cardiff Coal Co. .... Elk Ridge, W. Va.
Reliance C. & M. Co... Shelburne, Ind.
Carl Coal Co. .... Carlton, O.
Columbia Coal Co. .... Fairpoint, O.
W. & P. Coal Co..... W. Middleton, Pa.
Namoi Coal Co.........Fayette City, Pa.
Walnut Hill C. M. Co... Cannelville, O.
Beech Creek Coal & Coke Co. Winburne, Pa.
Quemahoning Coal Co. ... Ralphton, Pa.
Chas. F. Keeler C. C. .. Atherton, Ind.
Carver Bros. Co. .... Diamond, W. Va.
Huston Coal Co. .... Davis, O.
Chas. F. Keeler C. Co......Atherton, Ind.
Lucas-Ray C. Co. .... Turner, W. Va.
C. C. & M. Co. .. West Columbia, W. Va.
Carbon Coal Co. ... South Sarbon, W.Va.
Puritan Coal Co. .... Byesville, O.
Gallia Mining Co. .... Clarion, O.
Jackson Hill C. and C. Co. Kolsem, Ind.
Centennial Coal Co.........Louisville, Col.
Mohr-Minton Coal Co. .... McArthur, O.
Brown-Lam Coal Co. .. Mercer Sta., Ky.
Braznell Gas Coal Co.....Bentleyville, Pa.
Neff Coal Mining Co. .... Neff, O.
Sunnyside Coal Mining Co. Walsenburg, Col
Gordon C. & M. Co. .. Stewartsville, O.
Standard H. V. C. Co... Crooksville, O.
O'Gara Coal Co ...... Harrisburg, Ill.
Saltsburg C. M. Co. .... Edri, Pa.
Green Rilge Mining Co. Green Ridge, Ill.
A. G. Blair Mining Co. .... Adena, O.
Hart-Williams C Co. ..... Benton, Ills.
Benton Coal Co. .... Benton, Ills.
Pursglove Coal Mining Co. . Maynard, O.
Greenridge Mining Co... Greenridge, Ill.
O'Gara Coal Co. ..... Harrisburg, Ill.
Buckeye Coal Mining Co. . Flushing, O.
Hillside Coal Co.............Hillside, Ky.
O'Gara Coal Co. .... Harrisburg, Ill.
Bakewell Coal C o......... Bellaire, O.
O'Gara Coal Co. .... Eldorado, Ill.
Great Kanawha Col. Co. Mt. Carbon, W. Va.
Cabin Creek Mining Co. .. Kayford, W Va.
O'Gara Coal Co.............Eldorado, Ill.
Chesapeake Mining Co. .. Handley, W. Va.
Wender Blue Gem Coal Co... Halsey, Ky
R. T. Price C Co. .... Zanesville, O.
Quincy Coal Co. .... Dickinson, W. Va.
Thompson-Conn. C. Co. Republic Sta. Pa.
W. & L. E. Min. Co. ...... Herrick, O.
Davis Bros .... Shawnee, O
Jas. S Strabley C. Co.... Salineville, O.
O'Gara Coal Co. .... Harrisburg, Ill.
Burk Hollow Coal Co. .. Burk Hollow, Ky.
MacDonald Coal Co....MacDonald, W. Va.
Great Lakes Coal Co ...... Kaylor, Pa.
National Coal Co. .... Byesville, O.
Domestic Coal Co. .... Raven, Va.
Zeller, McClellan & Co. .. Diamond, Ind.
Wake Forest M. Co. Wake Forest, W.Va.
Crittenden C. & C. Co. .... Sturgis, Ky.
Roderick Coal Co. .... Quick, W. Va.
Blue Creek C. & L. Co....Blakely, W. Va.
Prudence Coal Co. .... Harvey, W. Va.
Thomas C. & C. Co. ...... Mora, W. Va.
Puritan Coal Co............Byesville, O.
Cecil Coal & Coke Co. .... Cecil, W. Va.
People's Coal Co. .... Brownsville, Pa.
Bannock Coal Co. .... Bannock, O.
C. E. Tibbals C. Co... Lower Greasy, Ky.
LaFollette C.I.&R.R. Co. Roosevelt, Tenn.
Kentucky C. M. Co. .... Waverly, Ky.
Middle Creek C. Co. ....Prestonburg, Ky.
National Coal Co. .... Byesville, O.
Ebey C. & M. Co. .... Middleport, O.
Dry Branch Coal Co. . Dry Branch, W. Va.
Almer Simons .... Redfield, O.
O'Gara Coal Co. .... Ledford, Ills.
Bannock Coal Co.............Bannock, O.
Carbon Coal Mining Co. .... Lathrop, O.
O'Gara Coal Co. .... Harrisburg, Ills.
Sunday Creek Co. .... Jobs, O.
Allegheny Coal Min. Co. .. Conifer, Pa.
Carroll and Franklin Co....Smothers, Ills.
Herriott Coal Co. .... Newhouse, O.
Otter Creek Coal Co. ... Fontanet, Ind.
O'Gara Coal Co. .... Harrisburg, Ills.
O'Gara Coal Co. .... Ledford, Ills.
River & Rail C. & C. Co. Uniontown, Ky.
The Salem Co. .... Salem, O.
Campbell C. & C. Co. .... Dilley, Tenn.
Starr Hocking Coal Co. ..... Starr, O.
Louisa Coal Co. .... Torchlight, Ky.
W. P. Rend Col. Co. .... Sesser, Ills.
Allegheny Riv. Mining Co. ..Conifer, Pa.
Beech Creek C. Co.. Beech Creek Jct., Ky.
W. Va. Colliery Co. .... Decota, W. Va.
Cambridge Val. C. Co... ..Byesville, O.
E. Grafton C. & C. Co. . Thornton, W. Va.
Hiawatha C. & C. Co. .. Hiawatha, W. Va.
Oak Forest Coal Co... Charleston, W. Va.
Sunday Creek Co. .... Mammoth, W. Va.
Pruden Coal & Coke Co... Pruden, Tenn.
Union-Connellsville C. Co. Uniontown, Pa.
S. Coal & Trans. Co.........Robards, Ky.
Williams Coal Co. .... Morris, W. Va.
Maynard Coal Co. .... Rutland, O.
Atlas-Pocahontas C. Co. .. Antler, W. Va.
Troll Coal Mining Co. .... Trolls, O.
N. Y. Clay & Mining Co......Buchtel, O.
Maynard Coal Co. .... Canneville, O.
Pgh-Westmoreland C. Co. Bentleyville, Pa.
H. T. Wilson C. Co. .... Logan, W. Va.
Sunshine C. & C. Co. ..... Martin, Pa
Panther Run Coal Co. ... Sherwood, Pa.
Sterling Coal Co., Ltd. Washingtonville, O

HENRY VOGT MACHINE CO.

INCORPORATED

LOUISVILLE, KY.

Manufacturers of

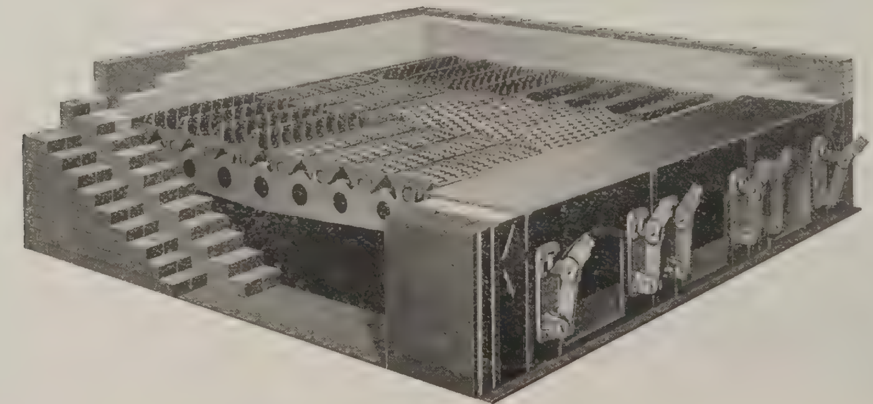
Water Tube and Horizontal Return Tubular Boilers

The Vogt Sectional Steel Casing.

PRODUCTS

- Water Tube and Horizontal Return Tubular Boilers.
- Ice and Refrigerating Machinery.
- Drop Forgings.
- Grey Iron Castings.
- Plate and Sheet Metal Work, Etc.

An ideal combination for the coal mine power plant.
Vogt Horizontal Return Tubular Boilers equipped with Sectional Steel Casings and Rocking Grates.
High efficiency at low maintenance cost.



The Vogt Sectional Rocking Grates.

The Walsh & Weidner Boiler Company

CHATTANOOGA, TENN

Manufacturers of

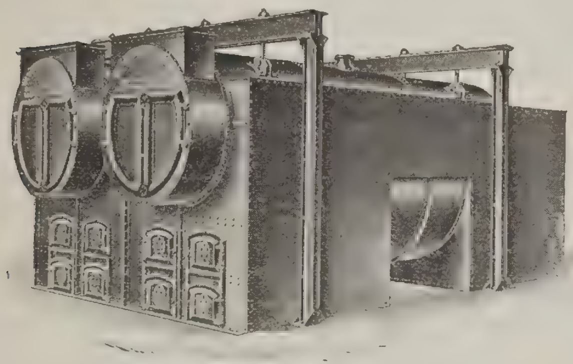
Boilers, Structural Steel Work, Tanks and Towers, Pressure Tanks, Stacks and Sheet Iron Work

We Carry a Large Stock of Boiler Tubes, Steel Plate, Rivets, Pipe, Fittings, Grate Bars and Boiler Castings.

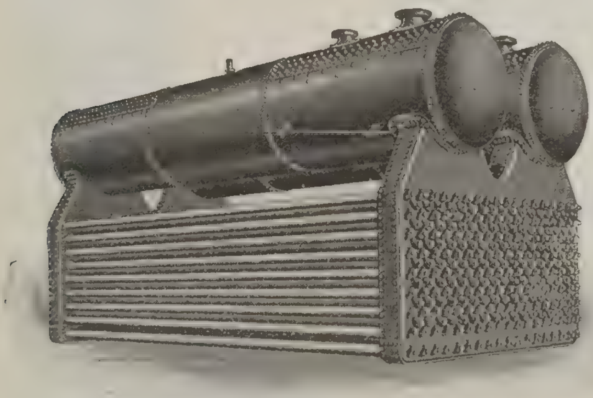
Products

We can furnish **Horizontal Return Tubular Boilers,** water tube, marine type with Morrison Corrugated or Adamson Ring Type furnaces, Portable, Vertical and Locomotive type boilers.

Steel Casings are now being used almost universally in the installation of horizontal return tubular boilers. They offer many advantages, minimum floor space, low cost of maintenance, portability and fuel economy. Can be furnished for single boiler or batteries of any number of boilers.



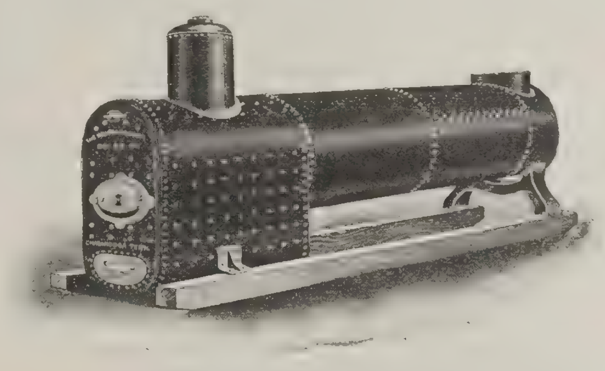
The Walsh & Weidner Improved Steel Casing for Horizontal Return Tubular Boilers.



The Walsh & Weidner Water Tube Boiler.

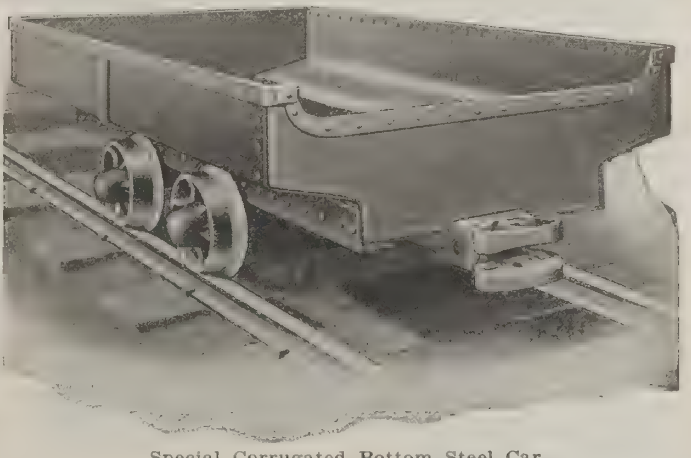
Horizontal **Water Tube Boilers** can be furnished in sizes from 75 to 500 H. P., in working pressures from 100 to 250 pounds. They are equipped with a very efficient mud and scale device, have a very large throat area, which guarantees perfect circulation, can be equipped with any form of automatic stoker, and is especially suitable for restricted spaces, such as office buildings and hotel basements. They are of all steel construction.

Our **Portable Boilers** are made in working pressures of 100, 125 and 150 lbs. We make them water front and water bottom, or water front and open bottom. We are prepared to build these boilers on quick notice and make prompt shipment. They are built in accordance with the Hartford Steam Boiler Ins. & Inc. Co.'s requirements.



Water Front Portable Boiler.

We illustrate below **Coal Mine Car** which we are prepared to build and ship promptly. These cars have special corrugated steel bottom with continuous drawn beams under the bottom, thereby preventing the same from buckling. They are made of heavy steel plate furnished with any style wheels, and are one of the best styles of Coal Cars on the market.



Special Corrugated Bottom Steel Car.

THE WICKES BOILER CO.

Main Office and Works:
SAGINAW, MICHIGAN
SALES OFFICES IN PRINCIPAL CITIES.

Manufacturers of Steam Boilers

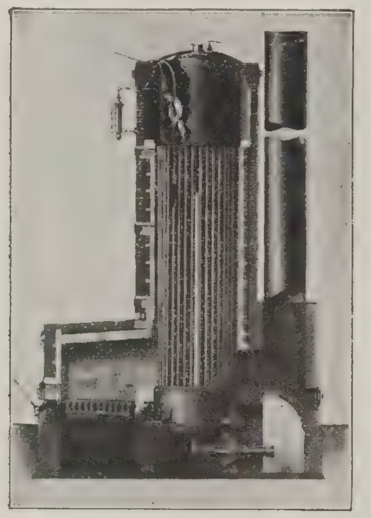
Wickes Vertical Water Tube Boilers and Steel Cased Boiler Settings

---

Products

The Wickes Vertical Water Tube Boilers.

Water Tube Boilers have proved their efficiency. The Wickes Vertical Water Tube Boiler has proven its superiority. First: It is constructed entirely of homogeneous material and uses straight tubes. Second: It operates with high commercial efficiency—the sum of all efficiencies.


Ask the Man Who CLEANS One.

A commercially efficient boiler is one which develops the greatest number of boiler horsepower hours per year with the highest thermal efficiency, while delivering the driest steam.

Cleaning and repairs cause boilers to stand idle. This lost time reduces its commercial efficiency. Therefore, that boiler is best which:

1st. Is so accessible that it can be cleaned in the shortest possible time.

2nd. Is simple, has few parts, and whose water circulation is so perfect as to maintain equal temperature in all parts of structure; hence, is durable; hence, free from repairs.

3rd. Prevents low furnace temperature, gas short circuiting and air infiltration. These are the enemy to high thermal efficiency.

4th. Delivers dry steam, hence prevents consuming unnecessary water, causing low engine and turbine efficiency and mechanical breakage.

The Steel Cased Setting.

Accessibility and Cleaning

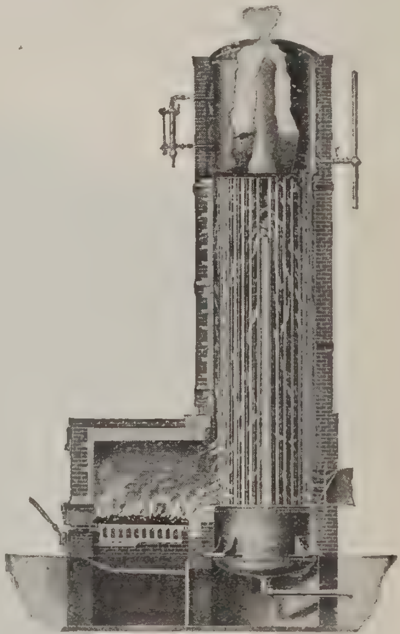
In the Wickes Vertical Tube Boiler two 11x15 inch manholes open in this boiler—one top—one bottom—inspection and cleaning is a simplified matter. Every tube can be looked through, washed or scraped. A boiler easy and quick to clean is likely to be cleaned often and well, that is human nature. If you have ever cleaned a boiler and lamed your back, bruised your knees, and skinned your elbows doing it you will appreciate the accessible construction of this vertical boiler at a glance. Two men can open, turbine and close this boiler in ten hours. You know how long it takes to clean some boilers.

Thermal Efficiency.

In The Wickes Vertical Water Tube Boiler high furnace temperature results from Dutch oven. Gases entirely and closely surround, therefore, scrub heating surface from entrance to release. There is no possible chance for short circuiting. The boiler heating surface absorbs the heat—empty pockets in setting lose heat. There are no empty pockets in this boiler. The steel cased settings are always tight, no cracked, warped, leaky, defective and unsightly settings exist with this type. A steel cased setting is a simple and sure cure for air infiltration losses. The largest preventable losses we have to contend with in boiler efficiency are excess air losses. A very long gas travel—hence long contact with heating surface is provided. Heat absorption is, therefore, assured.

High Steam Quality.

Did you ever wreck an engine by pulling water into it from boiler? Study this boiler. The steam drum gives great height from water line to steam outlet nozzle. This height provides room for separation of the steam from the water which is entrained with it at a point close to the surface of liberation. You do not pull water into engine from this boiler. Steam turbines receiving steam from this boiler never have their nozzles or blades eroded or filled up with matter carried over from boiler.


Quick Steaming Delivering Dry Steam.

ARMSTRONG MANUFACTURING CO.

SPRINGFIELD, OHIO

Manufacturers of

Stokers and Grates

Products

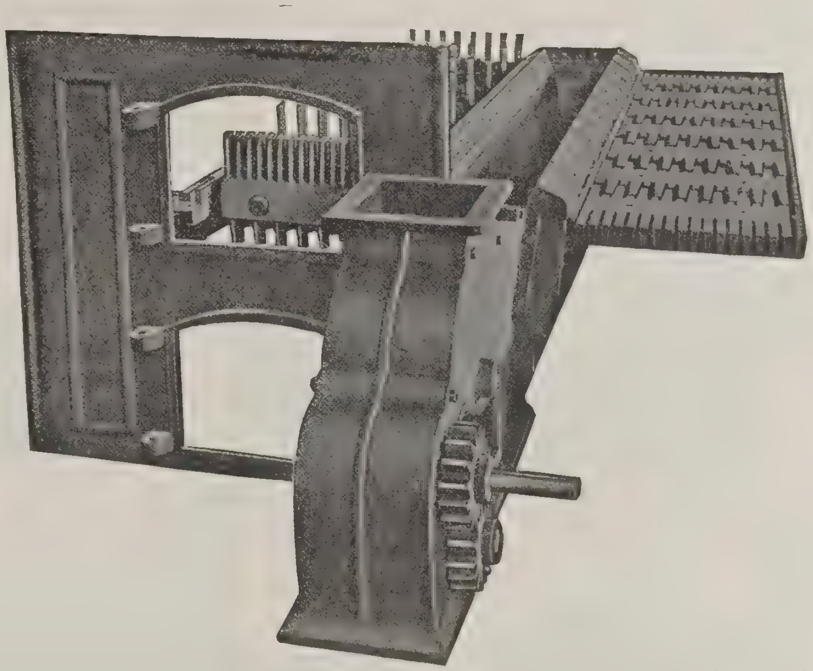
Armstrong Underfeed Stokers, Hollow Blast Shaking Grates, Shaking and Dumping Grates and Plain Grates.

Also, Boilers, Engines, Fans, Coal and Ash Handling Devices.

The Armstrong Underfeed Stoker

This device overcomes many difficulties encountered in operation of underfeed stokers. Its principal new feature is the use of hollow blast shaking grates on each side of horizontal retort, enabling the completion of combustion, under forced or natural draft, after fuel has rolled out of the retort, and cleaning the fires without the use of slice bars, pokers or hoes. It also prevents the formation of clinkers over the grates. There are other features in the details of construction which adapt it to use under any type of boiler.

Coal is fed from the hopper into a horizontal retort which extends to the rear of the furnace. In the bottom of the retort is an oscillating shaft to which are attached punchers that carry the fuel toward the bridge wall, forceing it up and over the edge of the retort its full length.



Armstrong Underfeed Stoker, showing arrangement of grate bars and the horizontal retort which feeds coal over the edges to the grates. Adaptable to any size or type of boiler, occupies only 28 inches in front of boiler setting.

Surrounding the retort is a wind box, with openings to receive the hollow trunnions of the grate bars, and slots running lengthwise of the retort on both sides near the upper edge, which admit air into the thick bed of coking and burning fuel over the retort. As the fuel passes over the edge of the retort it meets small blasts of air from the wind box coming through diagonal holes, and passes to the grates, where combustion is completed.

As previously stated, the grate bars are of the hollow blast shaking and dumping type, the air being furnished through hollow trunnions set into the wind box. Covering the hollow part of the grate bar is a dead plate in which are drilled small holes in diagonal angle to the surface, which prevents the formation of holes in the fuel bed. Grooves are also made in the edge of the dead plate which forces air out between the prongs of the grate bar, keeping them cool as well as supplying air needed for combustion.

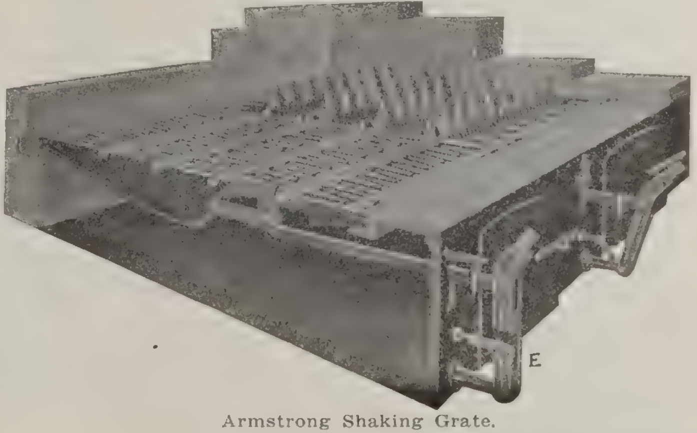
Coal is fed into the retort at such a rate that the fuel which reaches the grates is largely coke, which is there burned to ash and falls through the grate bars to the ash-pit. Occasional shaking of the grates, however, is sufficient to remove the accumulation, keeping the fire clean.

The stoker is self-contained, there is no excavating for the stoker necessary. It can be hand-fired and operated with natural draft or mechanical draft, limited space and smokelessness, moderate cost and quick installations.

Armstrong Grate

The Armstrong patented grate is an ash sifter, a vibrating grate, a shaking grate and a dumping grate. It has a new improved shaking mechanism that is fool-proof. By the lifting of Bar E these grates dump clinkers six inches thick. With Bar E down, it becomes a sifter and vibrating grate. The grate bar fingers are open just enough to let the fine ashes through and push clinkers loose. Thefingers will raise and lower four inches without increase of grate opening; hence, there can be no loss of coal when shaking. Its wonderful durability can be explained by the simple fact that eighty per cent of the weight is in the grate, where it belongs—not in useless framework.

Remember we put the Armstrong grate in on trial at our expense. And we also put it in on a trial test, at our expense, with any other make of shaking grate now on the market.



Armstrong Shaking Grate.

McCLAVE-BROOKS COMPANY

NEW YORK OFFICE
351 Fulton Bldg., 50 Church St.

MAIN OFFICE AND WORKS
SCRANTON, PA.

CHICAGO OFFICE
708 Fisher Bldg.

Manufacturers of

Stokers; Shaking, Cut-off and Dumping Grates, and Steam Blowers

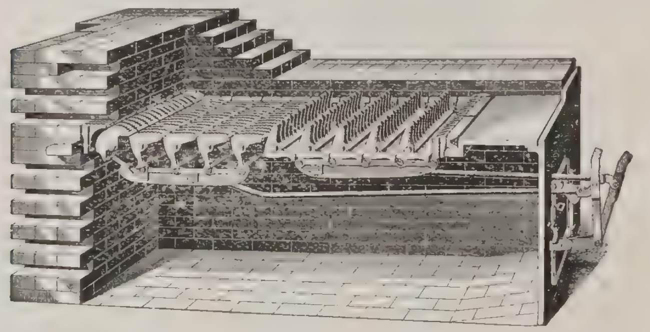
---

Products

McClave Grates; Shaking, Cut-off and Dumping Movements; Sectional Removable Top Grate Bars; McClave Stokers; McClave Furnaces; McClave Argand Steam Blowers. All kinds of Iron and Brass Castings.

The McClave System

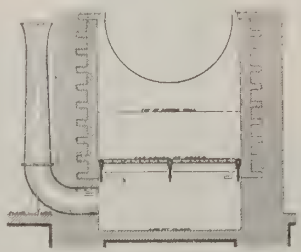
McClave Grates, with Argand Steam Blower, are designed for burning the cheaper and finer grades of fuel. Better combustion of fuels, such as anthracite buckwheat, birdseye, rice, bituminous slack, screenings, duff, etc., is produced by a forced draft.



Grates Nos. 1 and 2 are principally used for Soft Coal; Nos. 3 and 4 for smaller sizes of Hard Coal. Grate bars are furnished with suitable mesh for the fuel to be burned, 3-32 in. mesh being the smallest. All burn larger sizes by natural draft.

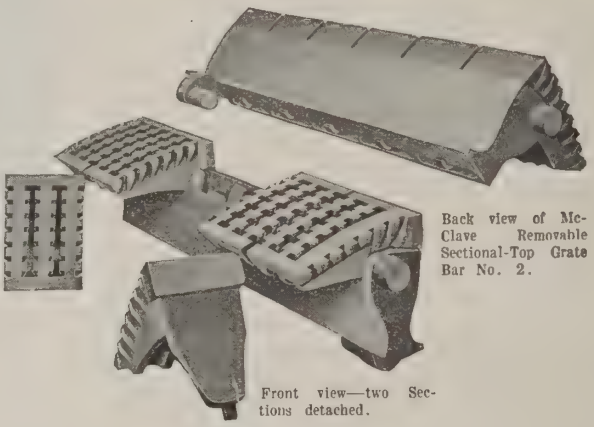
Details of Construction

Grates No. 1 and 2 have an absolute cut-off movement in which each row can be operated as a whole, or the front and rear separately, as desired; also a shaking movement in which there is no increase in the openings between the bars, consequently no waste of unconsumed fuel.



In the No. 1 Grate the regular grate bars are cast integral i. e., the top and pendant portions are cast in one piece. In No. 2 Grate the regular grate bars are made with sectional removable tops, similar to the No. 3 Grate.

Grate No. 3 has a double cut-off movement, in which each row can be operated as a whole, or the front and rear separately. The grate bars are made with sectional removable tops.



Back view of McClave Removable Sectional-Top Grate Bar No. 2.

Front view—two Sections detached.

Grate No. 4A is a dumping grate fitted with twin levers for operating the front and rear series of bars separately. The grate bars are made with sectional removable tops which overlap each other, and have beveled edges which allow for the expansion of the top without interfering with the use of firing tools when cleaning fire.

All journal bearing bars have expansion tops made with locking caps and plugs over the journals which prevent the bars from jumping out of the journals when cleaning the fire. All forgings and fittings are drop forged.

Argand Steam Blower

Designed and improved for furnishing blast to burn cheaper grades of hard and soft coal. They furnish a large volume of air with a small amount of steam—both being thoroughly mixed in the shell or case. They are almost noiseless in operation. Capacities are based on 90 to 100 lbs. steam pressure.

Data for Engineers and Mine Owners

McClave grates have no long lines of metal in contact with the heat, consequently cannot warp from the action of the heat of the fire on the grate. The sectional tops are interchangeable and easily replaced when required.

The movements of the grate provide methods for cleaning fires in the least possible time and without waste of unconsumed fuel. Grate bars are made with different sized meshes to suit the various grades and sizes of fuels, from 3-32 in. upwards. The constructions as a whole are very strong and durable.

Illustrated Catalog "K" furnished on application.

VALLEY IRON WORKS

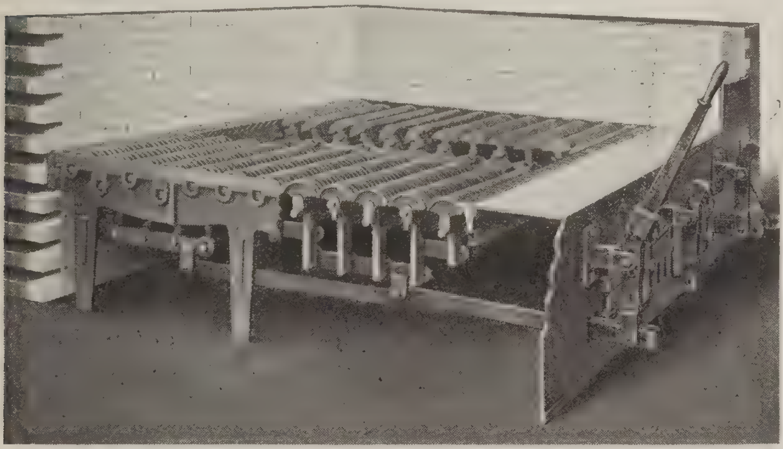
OFFICES AND WORKS
WILLIAMSPORT, PA.

Products

Ajax Rocking, Shaking and Dumping Grates, Chemical Machinery, and Shafting Appurtenances.

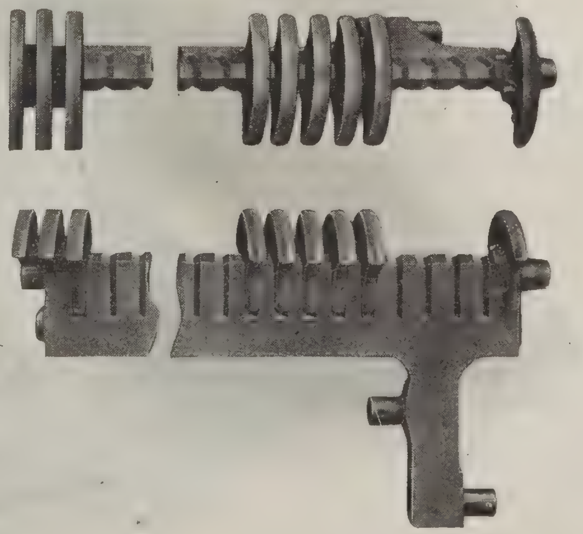
Ajax Grates fulfill all the requirements of a Rocking, Shaking and Dumping Grate, both from the standpoint of combustion and of mechanical construction.

We make the broad claim that an Ajax Grate will develop a higher fuel efficiency in any type of furnace than any other Grate in a similar furnace, and that cost of maintenance will be less than any other of actuating design and construction. To obtain, however, its maximum efficiency, the design of furnace should be as carefully considered as any other portion of steam power plant, for a properly selected Ajax installed in a well designed furnace will not only reduce fuel consumption but enable you to burn successfully a large proportion of the "bone" now thrown away.



Ajax Grates are made heavy enough to insure ample strength at all points, but contain no surplus material to make the parts unduly heavy or clumsy. The wearing surfaces of all moving parts are of generous proportions and so constructed that ashes and other gritty substances will not fall upon them. The complete Grate consists of one or more unit sections extending back the depth of furnace, each section being further subdivided into separately operated front and back halves. The first illustration herein represents a Six Section Ajax Shaking Grate for Bituminous Coal, central sections removed and part of cross bars left out to show construction details. Back half of far section thrown to a dumping and clinker-cutting position. The operating lever is shown in position for the grate at rest. The saddles of the Ajax Grate (the only parts touching the fire) are interchangeable and straddle on universal corrugations of the cross bar. Any saddle can be lifted straight up and out and a new one passed into the furnace in about one minute as shown in second illustration, and with no other tools than a pair of tongs, you cannot place them wrong. Moreover, they can be replaced while the boiler is under steam and fire is on the grate, it being necessary only to temporarily brush away the fire over the bad spot. Such repair is seldom necessary as the saddles will last as long as will any type of grate furnace.

The Ajax stands on its own legs. It is not tied to boiler walls or front.



Our Catalogue is yours for the asking.

Combustion Engineering Corporation

Owners and Manufacturers of

Type "E" Stoker---For Bituminous Coal
The Grieve Grate---For All Hand-Fired Fuels

Sole Representatives

Coxe Traveling Grate Co. The Automatic Anthracite Stoker

NEW YORK CITY
11 Broadway

PHILADELPHIA, PA.
718 Lincoln Bldg.

PITTSBURGH, PA.
Geo. J. Hagan Co.

CHICAGO
Fisher Bldg.

SALT LAKE CITY
American Stoker Co.

HAZLETON, PA.
Markle Bank Bldg.

BOSTON, MASS.
Schumaker-Santry Co.

MINNEAPOLIS, MINN.
Pocock &Pollard Co.

BIRMINGHAM, ALA.
Keiser-Geismer Engr. Co.

Products

Type "E" underfeed stokers for bituminous coals.

Coxe stokers for anthracite coal and coke breeze.

Grieve grates—Shaking, dumping and stationary.

Type "H" stokers for heating furnaces.

Type "E" Stokers.

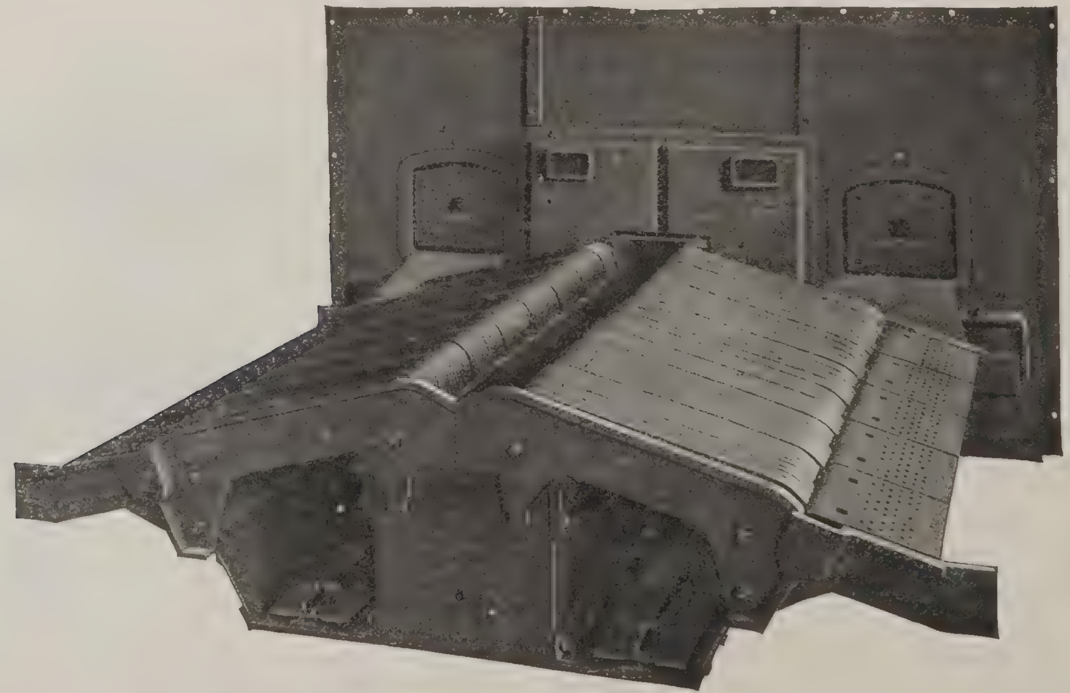
Especially designed for economical combustion of bituminous and semi-bituminous coal, including refuse from bituminous mines.

The Type "E" stoker is the result of several years' development and improvement on the earlier underfeed stokers. It has been for the past eight years, and is now, in successful use throughout the world, burning coals of more widely varying character than any other stoker on the market, ranging from lignite or brown coal to semi-anthracite.

Description of the Type "E" Stoker

In this stoker the coal is fed by hand labor or coal conveying machinery into a large hopper, and conveyed under the fire by means of the reciprocating sliding bottom of a feed trough or retort which runs the full length of the stoker. The coal is delivered uniformly from front to rear by auxilary pushers, and as it rises in the trough is distributed to the sides of the furnace by means of the moving bars. The burning fuel is constantly carried by the action of these bars to the dump plates along each side wall where the resulting ash or clinker is deposited. These plates are dumped by a single motion of the dump lever on the outside of the furnace.

The movement of the fire bars in addition to carrying the burning fuel to the sides of the furnace also conveys the clinker and ash down and onto the



dump plates. As the motion of fire bars at the outward end is slightly up and down, any clinker present is kept from forming in large pieces. Therefore, no difficulty is experienced in dumping as it is not necessary to remove large masses of clinker with slice bars. No fusing of clinker to bridge wall and no slipping and sliding of fire or bare spots and thick masses of coke, as gravity cleaning is eliminated.

Distribution of Air

Air for supporting combustion is supplied by a volume blower or fan connected to the stoker wind box by a pipe or duct. One of the important features of this stoker is the distribution of the air, all of which enters the stoker through the opening in the bottom of the wind box.

After entering the wind box the air passes upward along each side of the retort and is discharged partly through the tuyere openings in the inside or retort end of the fire bars; the remaining air passes through the hollow fire bars, which are of box-like cross section, and is discharged into the auxiliary air boxes. From these chambers the air enters the fire through openings between the fire bars.

The function of the fan in the Type "E" stoker installation is to furnish the required volume of air at a pressure sufficient to overcome the resistance of its passage through the tuyeres, hollow grate bars and fuel bed, beyond which point it is the function of the chimney—the natural draft—to draw the products of combustion through the boiler with sufficient rapidity to maintain the conditions necessary for the economical operation of the boilers and furnaces.

Adaptability

The fact that the Type "E" stoker is in use throughout Europe, South America and in the United States, burning coking or non-coking coal ranging from ten to forty per cent volatile matter, and five to thirty per cent ash, and under all types of stationary boilers is sufficient proof of its adaptability.

Installation

The Type "E" stoker may readily be applied to existing hand fired boilers with but little change in boiler settings. Hopper ash pits, though desirable, are not necessary. Deep ash pits are not required as ashes may be removed from boiler room floor level. The stoker, therefore, may be installed under boilers where other types of stokers would be impracticable on account of the cost of providing deep pits.

Sizes

We are prepared to furnish stokers to fit practically any conditions. Our sizes range from 36 to 115 sq. ft. of grate surface in single units, furnaces of extreme width can be fitted with two or more stokers.

Adaptable to present boiler settings and can be installed with slight changes only.

Prices and bulletins on request.

Coxe Stokers (Combustion Engineering Corporation)

This machine is designed and built to burn economically the small sizes of anthracite coals, including mixtures of barley and silt and refuse banks in the anthracite region. Boilers can be operated at from 150 to 225 per cent of their rated capacity. This machine is also adapted for the burning of Coke Breeze at high ratings.

This machine enables anthracite mines and coke properties to utilize their refuse material and release for market large quantities of marketable product, which they are now using in their own consumption to produce power.

These machines are made in varying widths from 5 to 10 ft. and lengths to give the proper grate area for the kind of fuel to be burned and rating required.

Substantially built, simple in operation and but little labor required to operate.

Send for prices and particulars.

Type "H" Stokers (Combustion Engineering Corporation)

This type of stoker is exclusively used in connection with metal work. In its application to metal heating furnaces, annealing ovens, core ovens, dryers, evaporators, etc., it has been found to be most successful. It will be found in most of the mills of the country.

Grieve Grates (Combustion Engineering Corporation)

Forced draft and natural draft grates, giving the most equal and even distribution of air throughout the entire bed of fuel. For hand-fired situations it is easily operated, and owing to its construction there is practically no loss of fuel into the ash pit.

Made in dumping, shaking and stationary types.

Prices and description forwarded upon request.

Coppus Engineering & Equipment Company

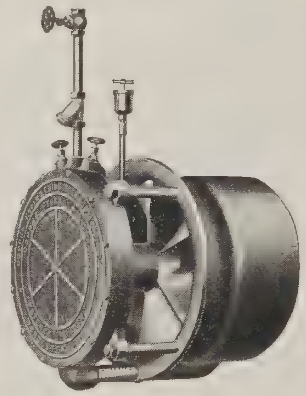
Main Office and Works
175 UNION STREET, WORCESTER, MASS.
Manufacturers of

Turbo Blowers, Damper Regulators and Steam Turbines

Forced Draft for Boilers

To keep up steam is the first requirement in a mine boiler plant. Sometimes it is necessary to burn good salable coal when refuse coal is available and even then the steam pressure will drop. The Coppus Turbo Blower increases the capacity of boilers from 100% to 200%, keeping the steam pressure constant all the time and not making it necessary to install more boilers and allowing to keep one or more boilers out for repairs and cleaning.

For the burning of the so-called refuse coal, as anthracite dust, soft coal, slack and bone coal, a blower of some sort is necessary. Not every blower, however, will burn these fuels with the same degree of efficiency. The Coppus Blower has been especially designed to meet the specified operating conditions in each individual plant and is not simply adapted for all conditions. For this reason these are several Coppus designs.



Coppus Turbo Propeller Blower.

We build our blowers with either single or double stage turbine, with different types of exhausts, with outboard or inboard bearings, with straight or expanding fan casings, and equip each size with any one of one-half dozen different fans, whichever is best adapted to the conditions. Where necessary, special designs for unusual requirements are furnished. The Coppus is built to stand the "acid test" of actual use. The superior design is backed by expert manufacturing ability. These and the following construction features are the secret of our success and explain why half a million boiler horse power were equipped with Coppus Turbo Blowers in four years.

1.—The Coppus is of the enclosed, separately mounted, large diameter turbine type, which means quiet operation and high economy at the most efficient fan speeds.

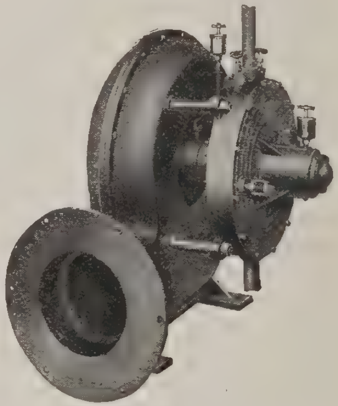
2.—The Coppus is the only turbo-blower of this type in which the fan does not overhang the bearing and in which the exhaust steam can be discharged into the fan casing, when so desired.

3.—The Coppus was the first turbo-blower with individual nozzle control in which the steam chamber is sectionalized into small compartments for each nozzle and does not extend clear around the periphery of the casing. It was the first to use ball bearings, and in the Type B it was the first to use an outboard bearing for the turbine.

4.—The Coppus Turbo Blower—size for size—delivers more air at any specified pressure and uses from 25% to 75% less steam than any other turbo blower made. We will be glad to back up this statement by a comparative test. The Coppus has replaced a great many other blowers, but no other blower has ever replaced a Coppus.

Coppus Turbo Centrifugal Blowers

While the Coppus Turbo Blower for forced draft for boilers may be used for other purposes, as, for instance, ventilation, the Coppus Turbo Centrifugal Blower has been especially designed for conditions where higher pressures are required than is economical to give with the propeller type blowers. This blower being built in small and large units, and being portable, may be used to very good advantage for ventilating mine shafts, and may be driven by either steam or compressed air. The blower is also admirably adapted for stokers where a higher pressure is necessary than our standard blower for undergrate draft can give economically. It further finds a wide range of use in manufacturing plants for cooling rolls and other industrial purposes.

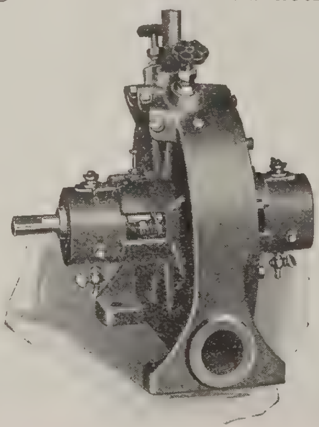


Coppus Turbo Centrifugal Blower.

Coppus Damper Regulator

The Coppus Damper Regulator is used to operate the Coppus Turbo Blower automatically through means of a balanced valve and is a guarantee for constant steam pressure, as it takes the regulation of the blower out of the hands of the fireman.

Damper Regulators have been used for a large number of years, and the Coppus Damper Regulator has been patterned after the type which has given the best satisfaction and which allows the widest range of adjustment. It enjoys the distinction of being built in our own shop, equipped with the most up-to-date machine tools, and therefore insures the highest degree of workmanship.



Coppus Steam Turbine.

Coppus Steam Turbines

We build steam turbines up to 50 H. P. for either belt or direct connection to propellers, dynamos, blowers, and pumps.

G. L. SIMONDS & CO.

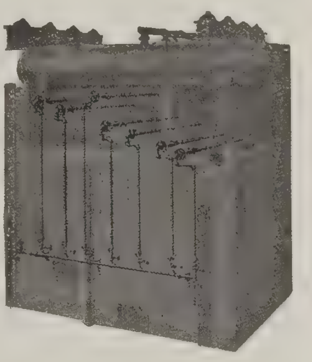
503 GAFF BUILDING, CHICAGO
Main Office and Factory, DuBois, Pa.

The Vulcan Soot Cleaner

For All Types of Water Tube, Marine and Return Tubular Boilers

Description

The Vulcan Soot Cleaner is a complete permanent mechanical cleaning system comprising standardized elements which are arranged to form different designs according to the type of boiler conditions to be met. The Vulcan consists of numerous blower elements equipped with special nozzles. The elements are mounted on bearings, and are rotated by a chain and sproket wheels outside the setting.



Horizontal Water Tube Boiler and Superheater equipped with Vulcan Soot Cleaner with rotatable elements to blow diagonally down the clear paths among the tubes. The sides of the boiler are bricked up solid so that there is no air inleakage. The valves and operating chains are at a convenient height from the floor, irrespective of the height of the setting.

Principle

The principle of the Vulcan is to secure a perfect distribution of powerful steam and gas currents throughout the entire heating surface.

Advantages

The advantages resulting from a heating surface **cleaned** and **kept cleaned** by the Vulcan are as follows:

1—Greatly increased boiler capacity, thereby making the purchase of additional boilers often unnecessary.

2—More heat utilized from coal consumed, therefore, less coal to burn, and **coal saved is coal sold.**

3—Permits of **frequent** cleaning (every 6 or 8 hours), instead of once a day or possibly once a week, as with hand cleaning.

4—Labor saved and the dirtiest job in the plant eliminated.

5—Danger of accidents from hand-blowing eliminated.

6—No cold air admitted when blowing, and tighter setting maintained at all times.

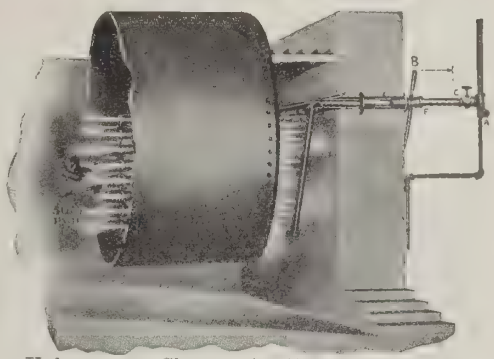
7—Removes ALL SOOT; whereas the hand blowing simply blows the soot from the near to the far side of the boiler,—the soot remaining.

8—Reduces uptake temperature, often in excess of 100° F.

9—Experience: The Vulcan Soot Cleaner is the pioneer soot cleaner for water tube boilers, having back of it a wide and invaluable experience of sixteen years.

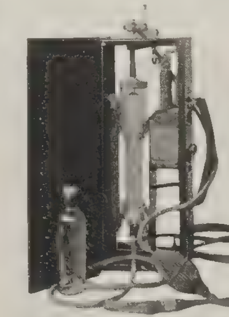
You can make no mistake of giving your patronage to those who originated the Vulcan idea, and have seen it thru to success.

Drop us a line for our Catalog, or, what might be termed "Text Book" on Soot, ninety-one pages just from the press.



Vulcan Soot Cleaner Applied at Rear End of Tubular Boiler.

Can be installed at front or back end, the blow arm being rotated by handle from the outside, without opening the boiler in any way. Eliminates all drudgery of scraping and blowing tubes, and enables tubes to be cleaned every three or four hours. Greatly increases boiler capacity.

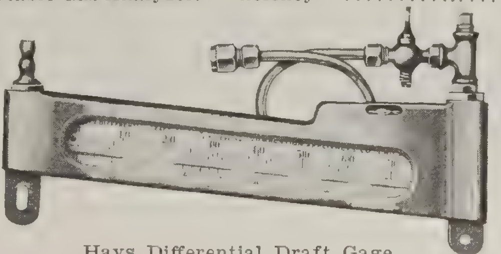


Hays Portable Gas Analyzer.

Let us send you a cleaner on 60 days trial, guaranteed to pay for itself in six months, or cleaner returned and money refunded. Price $55.00, including valves, F. O. B. DuBois, Pa.

Hays Gas Analyzer Instruments

For CO2, O. & CO.........	$ 35.00
Hays Automatic Sampling Vessel	30.00
Hays Draft Gauge, ¾".....	10.50
Hays Draft Gauge, 1½"...	12.50
Hays CO2 Recorder.......	300.00
Hays Popular Book, "How to Build Up Furnace Efficiency"	1.00



Hays Differential Draft Gage.

This gauge is used conjointly with the Hays Gas Analyzer to find the methods of furnace operation that will insure the **most** steam with the **least** coal. This gauge should be on every furnace in order to maintain the same draft on all.

The Hays Gas Analyzer is the instrument to be used in checking up your coal loss and finding the proper methods of furnace operation. Compact, portable, simple to operate, and built to resist hard usage, furnished complete with all necessary tubing and chemicals.

Vulcan Boiler Coating

A coating to stop air infiltration thru boiler settings, will not crack, oxidize or peal under 500° F. Is elastic and will expand and contract with brick work and is easily applied with brush.

The chief cause of fuel loss is excess air. Stop air leakage with Vulcan Boiler Coating and increase furnace and boiler efficiency.

Price in	50 gallon Lots—	$2.00 per gallon
" "	25 " "	2.10 " "
" " 10 or 15	" "	2.20 " "

One gallon covers over 100 Sq. Ft., two coats.

ALLIS-CHALMERS MFG. CO.

MILWAUKEE, WISCONSIN

Branch Offices in All Principal Cities

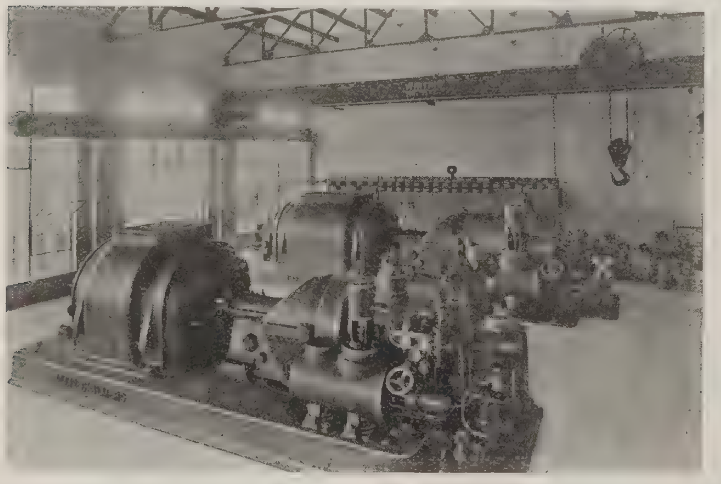
Power and Electrical Equipment for Mines

Products

Turbines, Condensers, Corliss Engines, Boiler Feed Pumps, Alternating and Direct Current Generators and Motors, Rotary Converters, Transformers, Switchboards, Motor-Generator Sets, Air Compressors, Electric and Steam Driven Hoists, Centrifugal Pumps, Coal Crushing Rolls, Crushers and Pulverizers, Revolving and Shaking Screens, Power Transmission Machinery, Ventilating Fans.

Steam Turbine

The Allis-Chalmers turbine is made in all commercial sizes. The demand is primarily for high pressure condensing machines; however, the Company builds all types, including low and mixed pressures. The generators are wound for both direct and alternating current. The steam turbine (because of its simplicity, low cost of up-keep and great economy, together with its compactness), is a very desirable prime mover for coal mining purposes.



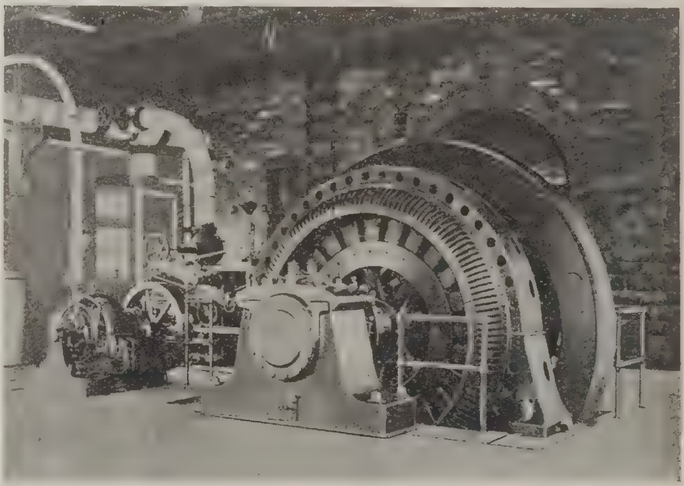
Steam Turbine.

The small turbines are designed with great simplicity for direct-connection to pumps, blowers, small generators, etc. Send for Bulletin No. 1084.

Corliss Engines

This type of prime mover is used where conditions of operation make it better suited to coal mining conditions. This Company manufactures both steam engines and turbines, and gladly extends the service of their Engineering Department to assist in the design as to the proper type of prime mover to install in order to meet any specific condition.

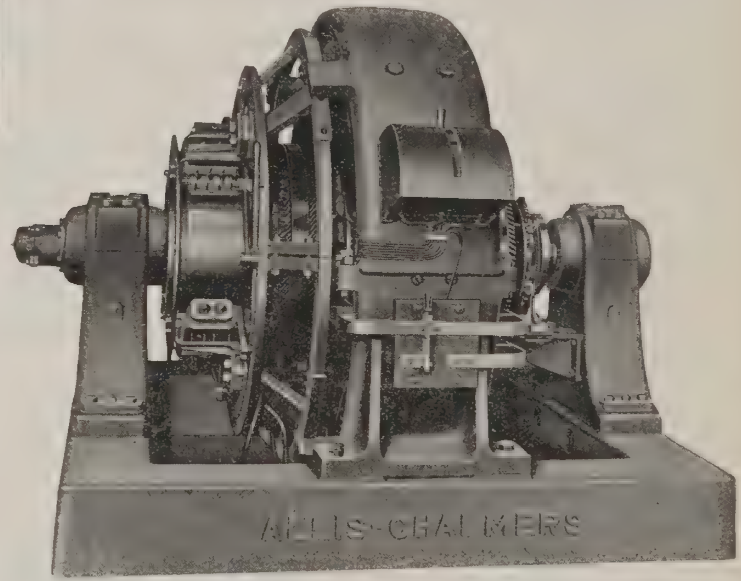
The heavy duty one-piece frame and slide (all machined at one setting), the patented adjustable ball and socket type self-aligning bearings, the enclosed type governor, are a few of the many distinctive features in the design of this engine. The machines are built for direct-connection to generator, ventilating fans, etc., or for belting, as the conditions require. Send for Bulletin No. 1529.



Corliss Engine Generator Unit, McKell Coal & Coke Co., Kilsyth, W. Va.

Rotary Converters

The Rotary Converters designed for mining service are very rugged in construction and capable of carrying large overloads. They are built in standard capacities of 100-kw and larger.

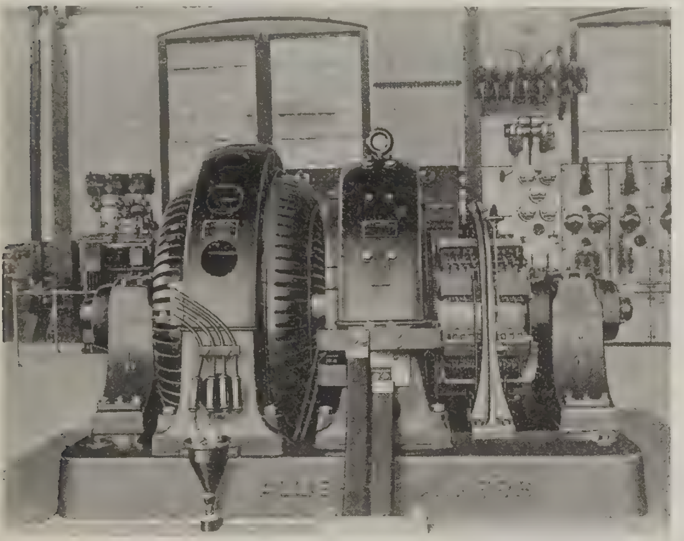


Rotary Convertor, McKell Coal & Coke Co., Kilsyth, W. Va.

The machines have special moisture-proof form wound coils and are self-starting from either side. The bearings are of the pedestal ball and socket self-oiling and self-aligning type. The liberal and open design affords means for inspection and cleaning. Send for Bulletin No. 1092.

Motor Generator Sets

The Motor-Generator Sets are built in all standard sizes for coal mine service. The special moisture-proof form wound coils, the correct and liberal design of all parts, assures large momentary overload capacity. The pedestal ball and socket type of self-oiling bearings, the method of supporting the brush rigging, etc., affords ready access for inspection and cleaning. Combinations are built of self-starting synchronous motors, induction motors, direct current, two and three-wire generators, etc. Send for Bulletin No. 1090.



Synchronous Motor Generator Set.

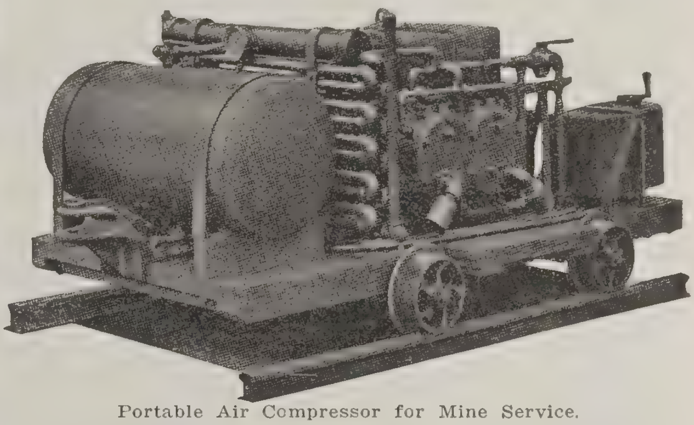
Transformers

These transformers are designed for power and lighting service. They are built in all commercial sizes for lighting and power transmission and for use in connection with Rotary Converters. A distinctive feature of the Allis-Chalmers transformers is the jacketed tank. They are furnished in self-cooled, water-cooled and air-cooled types, wound for all voltages and frequencies embodied in coal mining service. Send for Bulletins Nos. 1097 and 1088.

Oil Filled Self-Cooled Power Transformer.

Air Compressors

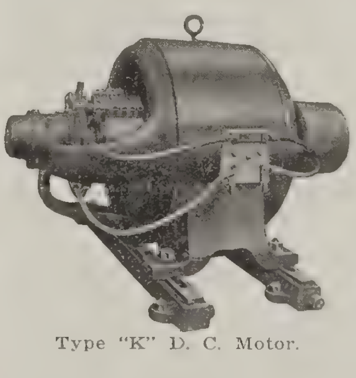
This type of air compressor is particularly adapted for coal mining service. It is built in sizes ranging from 11 cu. ft. to 50 cu. ft. capacity and either motor driven or belted type. They are used for supplying compressed air at 100 to 125 lbs. pressure for drilling overcasts and holes for line material, riveting mine cars, spraying paint, operating jack hammer drills, cleaning machinery, etc. These machines can be mounted on standard mine car trucks, and if desired may be self-propelled for use in the mine. Send for Bulletin No. 1536.



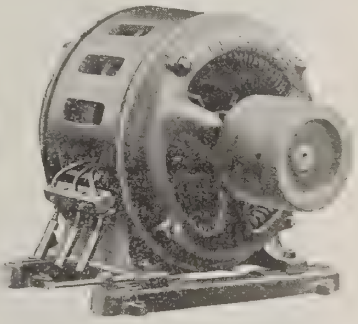
Portable Air Compressor for Mine Service.

The Allis-Chalmers Manufacturing Company also manufacture large capacity motor or steam engine driven air compressors of the stationary, single and two-stage type for Power Plant installation. Send for Bulletin No. 1531.

This Company manufactures a complete line of both direct and alternating current motors. The machines are designed with large overload capacity and for all commercial ratings and including a wide range of speeds. The direct current motors are of the shunt, series and compound open or enclosed type. The alternating current motors are squirrel cage (including two speed for fan drive), wound rotor and synchronous type. All are furnished for standard voltages used in coal mine service. The heavy frame construction, self-oiling bearings and large shafts are a few of the notable features in their design. Send for Bulletins Nos. 1087-A and 1096.



Type "K" D. C. Motor.



Type "AN" Induction Motor.

GENERAL ELECTRIC COMPANY

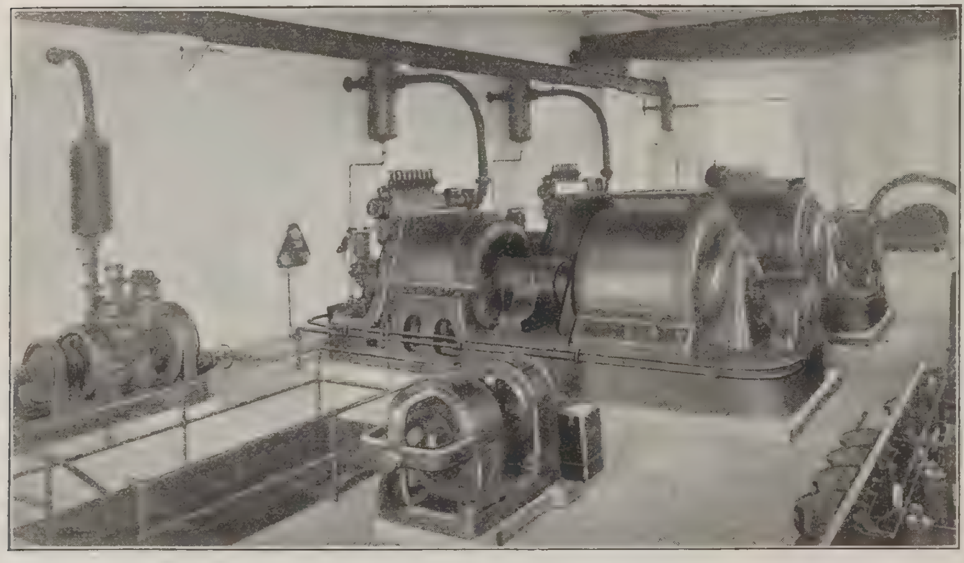
General Offices:
Schenectady, N. Y.

The Guarantee of Excellence
on Goods Electrical

Sales Offices
In All Large Cities

ELECTRICAL EQUIPMENT FOR MINES

The engineers of the General Electric Company have been designing and supplying special electrical apparatus for mine use during the last quarter century. The data and experience from many thousand mine installations, all over the world, is available to our designers of special electrical apparatus for mine use including steam turbines, generators, transformers, switchboards, motors and control equipment, motor generator sets, rotary converters, electric mining locomotives of every type and combination of types desired, portable mine air compressors, etc., etc.



3000 kw. Curtis Steam Turbines, Rochester and Pittsburg Coal and Iron Co. Punxsutawney, Pa.

The Curtis turbine is made in all sizes from a few kilowatt capacity, up to the largest in existence. It is not only more economical than other types, but its high economy is maintained over wide variations in load.

Aside from the resulting saving in coal, less load is imposed on the boiler plant, and in many cases an appreciable saving in cost of coal handling and firing has been effected. That this feature is generally understood and appreciated by mining companies is shown by the very large number of Curtis Turbines employed in this class of service.

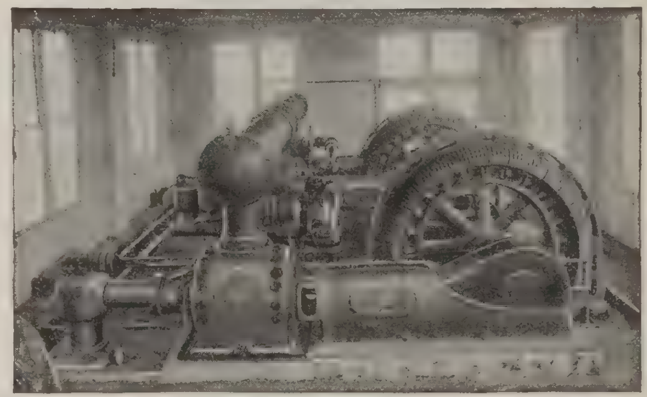
The Curtis Turbine is designed throughout with an extremely liberal factor of safety; constructed of the very best material, correctly proportioned for the service required. The stresses to be met are determined with absolute exactness. The selection of material to be used is governed not only by the results of long experience, but by constant and rigorous tests. The complete Curtis Turbine is, therefore, as nearly perfect mechanically as it is possible to build. As a result, power supplied by Curtis Turbines is seldom interrupted by shut downs, and operators are assured of constant operation of motors, hoists and other electrically driven apparatus.

Geared turbines are available in a considerable range of sizes, adaptable to direct current generators, or other apparatus which runs at lower speed than the most efficient turbine speed. The gear is simple in construction, and its initial high efficiency is maintained in service.

A number of small turbines are available, particularly designed for direct mechanical drive, that is, for connection to pumps, blowers, etc., for which class of work the small and compact design and few parts render them particularly suitable.

The electric end of Curtis Turbine sets consists of a generator embodying the superior features characteristic of all G-E generators, combined with a mechanical design particularly adapted to the turbine which drives it.

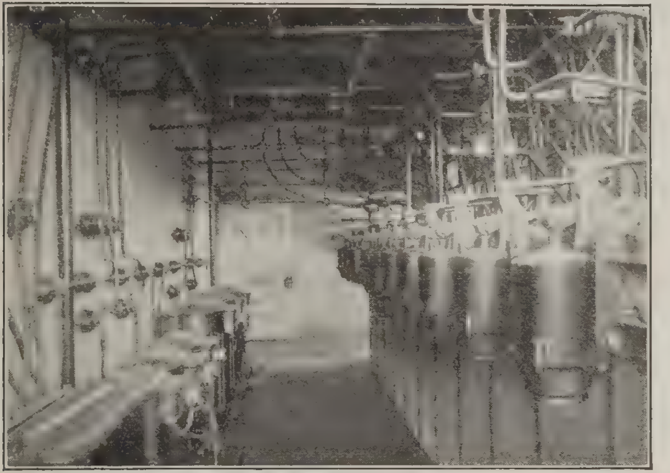
The extreme operating temperatures of the generators, are all well within the limits which insulation will satisfactorily withstand. This assures ample margin for unusual or extraordinary conditions, as well as long life for insulation.



2650 Cu. Ft. (At 100 Lb.) Air Compressors, Driven by 450 kv-a., 6000 Volt Synchronous Motors, Buffalo, Rochester and Pittsburg Coal and Iron Co., Punxsutawney, Pa.

Synchronous motors are furnished for driving air compressors and improving the power factor of mine transmission lines having a large induction motor load.

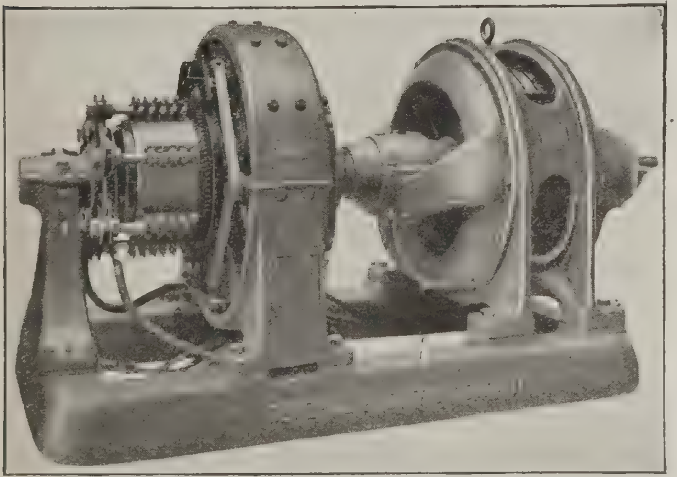
The General Electric Company transformers furnished for mine use are stanchly made and capable of withstanding rough treatment in transportation as well as severe service operating conditions. They are designed and built to meet all the exacting requirements attendant upon mine conditions. In their construction are embodied the same features which have given to G-E transformers the preference with the great central stations in this country.



G-E Transformers and Oil Switches; Buffalo, Rochester and Pittsburg Coal and Iron Co., Punxsutawney, Pa.

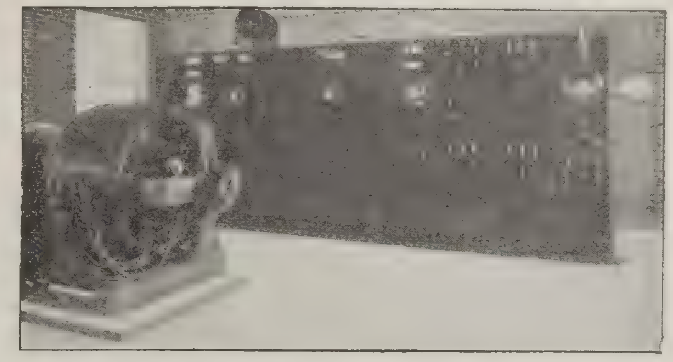
Motor generator sets manufactured by the General Electric Company are designed to assure continuous operation under the varying conditions of load found at mines. These sets will stand from 100 to 150% overloads momentarily without injury.

Fire proof series and commutating field windings of a self ventilating type, armature equalizer connections mounted on back of armature where they are easily kept clean and armature conductors held in place by wedges and easily replaced in event of accident are a few of many superior features found in these machines.



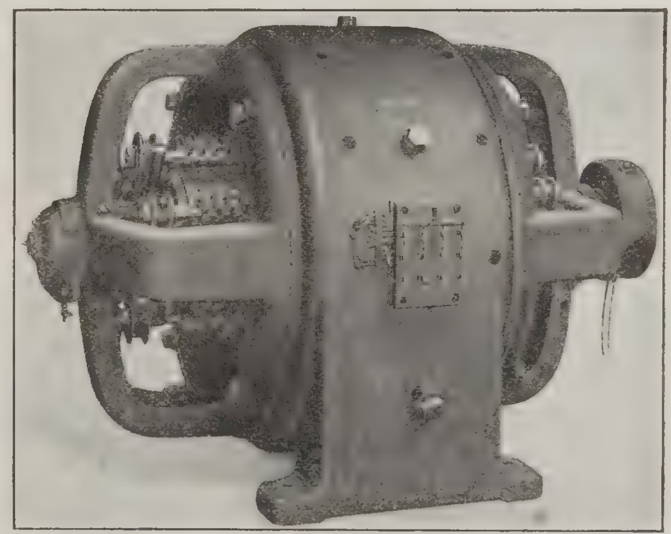
150 kw. G-E Motor Generator Set.

G-E switchboards for mine work are reliably and correctly designed, with special reference to mine conditions. Among their many advantages—where grounded neutrals are used in connection with mining locomotive service—these switchboards permit multiple connection of the series field of an incoming generator with those of running machines. This permits voltage adjustment before closing the main switch, insuring correct polarity of the incoming machine and the least disturbance in paralleling.



G-E Switchboard, J. K. Dering Mine, Clinton, Ind.

G-E Rotary Converters designed for mine service are highly efficient and capable of carrying 100 to 150% momentary overloads. These machines are self-starting from the alternating current end, have moisture resisting windings and easily removable form wound coils and are successfully applied in many representative mines throughout the world in all sizes up to 4000 Kw. or larger.



100 kw. Synchronous Converter.

WESTINGHOUSE ELECTRIC & M'F'G CO.

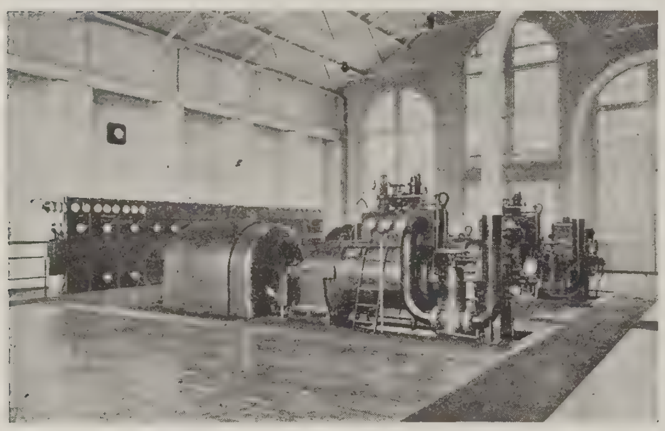
EAST PITTSBURGH, PA.

SALES OFFICES

Atlanta, Ga.
Baltimore, Md.
Birmingham, Ala.
Bluefield, W. Va.
Boston, Mass.
Buffalo, N. Y.
Butte, Mont.
Charleston, W. Va.
Charlotte, N. C.
Chicago, Ill.
Cincinnati, Ohio.
Cleveland, Ohio.
Columbus, Ohio.
Dallas, Tex.
Dayton, Ohio.
Denver, Colo.
Detroit, Mich.
*El Paso, Tex.
*Houston, Tex.
Indianapolis, Ind.
Joplin, Mo.
Kansas City, Mo.
Louisville, Ky.
Los Angeles, Cal.
Memphis, Tenn.
Milwaukee, Wis.
Minneapolis, Minn.
New Orleans, La.
New York, N. Y.
Omaha, Neb.
Philadelphia, Pa.
Pittsburgh, Pa.
Portland, Ore.
Rochester, N. Y.
St. Louis, Mo.
Salt Lake City, Utah.
San Francisco, Cal.
Tacoma, Wash.
Toledo, Ohio.
Seattle, Wash.
Spokane, Wash.
Syracuse, N. Y.
Washington, D. C.

*W. E. & M. Co., of Texas.

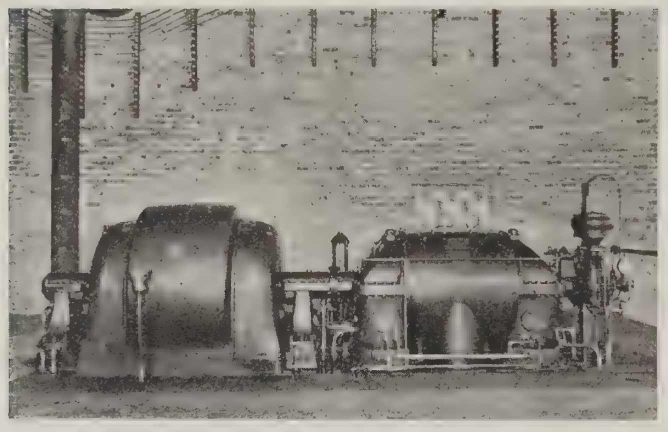
Prime Movers and Auxiliaries



Two 1,000 K.W. High Pressure Turbine Units.

High Pressure Turbines.

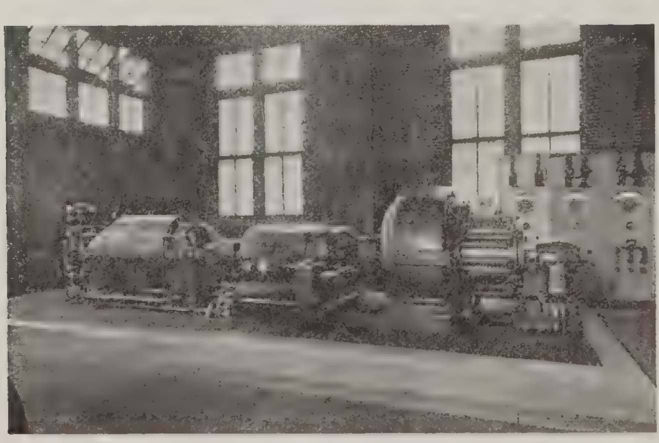
The demand for reduced cost in producing all commodities is national. Savings are today being effected which a few years ago were considered unnecessary. Formerly the cost of fuel, for producing power at a coal mine, was considered a negligible item, but today the amount used is charged for at market price. With the changing conditions, more economical prime movers are necessary, hence the increasing use of turbines. The steam turbine is today—because of its simplicity, reliability, low cost of upkeep, and excellent economy—recognized as the standard prime mover. The steam turbines manufactured by this company range in size from 15 to 70,000 kw.



600 K.W. Low Pressure Turbine Units.

Low and Mixed Pressure Turbines.

If you are now operating non-condensing units in your power plant a marked improvement in economy and increase in capacity may be obtained by the use of a Low or Mixed Pressure Turbine. Such a turbine may be operated from fans, pumps or hoists, and in many cases it is possible to carry your entire electrical load with exhaust steam from such sources. In some plants the reciprocating engines furnish direct current for use near the power house while the turbine generates alternating current for use at distant points. If desirable the two systems may be connected by a rotary converter or motor generator set.



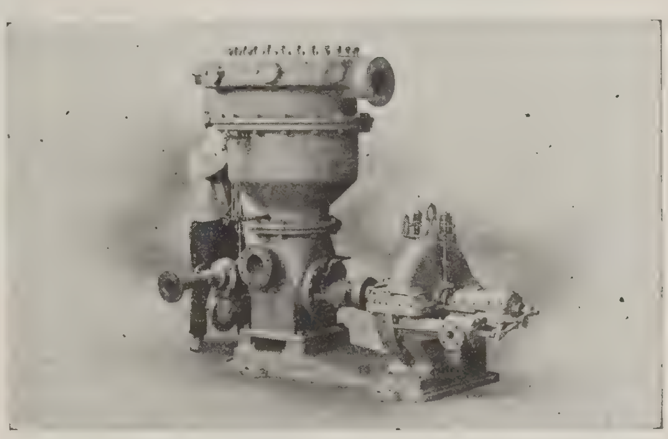
500 K.W. Direct Current Turbine Unit.

Direct Current Turbine Units.

When the use of direct current is advisable the installation of a Westinghouse Reduction Gear solves the problem in a most satisfactory manner. Such a gear reduces the high speed of a turbine to that of a standard direct current generator. The floating pinion shaft of this gear insures high efficiency and long life without constant expert attention. If the radius of load distribution is short such direct current units may be preferable to alternating current. The success of any exhaust pressure installation depends largely on the selection of the proper type of turbine.

Condensers

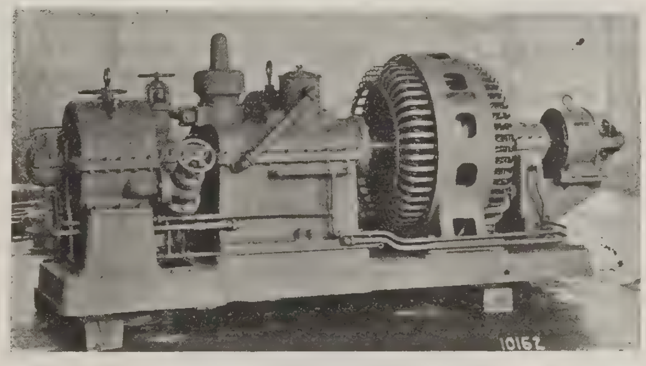
As the turbine is replacing the reciprocating engine, so are auxiliaries of the centrifugal type replacing those of the reciprocating type. The Westinghouse-Leblanc Condenser is the simplest and at the same time the most efficient on the market today. The same type of air pump is used with all our condensers—low level jet, barometric and surface. This pump consists of a single revolving element, there being no valves, close clearances or rubbing parts. When used with cooling towers or spray nozzles the amount of water lost will not exceed that used for boiler feed when running non-condensing units.



500 K.W. Low Level Jet Condenser.

Small Geared Turbo-Generator Sets

Westinghouse geared, turbo-generator sets are available at reasonable cost, in capacities from 15 to 500 kw. They are ideal variable load units—especially suited to plants which have only a small lighting load at night, for their economy is practically as good at fractional loads as at full load. In addition, they occupy less space, and take lighter foundations than engine sets of equal capacity. There are no reciprocating parts, such as eccentrics or cranks, no stuffing boxes to pack, and few wearing parts. They are rugged and thoroughly reliable. They require minimum attention, and the up-keep is exceptionally low. The exhaust steam is free from oil and may be used for heating or other purposes.



Stokers

With our three types of Stokers, there is no company better prepared to meet the load and fuel requirements which are found to vary so widely in different plants. It is our practice in every instance to make a thorough study of plant conditions so that that type may be recommended which will secure the most economical overall result.

BALL ENGINE COMPANY

ERIE, PENNA.

Builders of

High-Grade Steam Engines

Pittsburgh Representatives:

DRAVO-DOYLE COMPANY

Pittsburgh, Cleveland, Indianapolis, Philadelphia.

Products

Single Cylinder, tandem compound, and cross compound Single Valve automatic engines from 50 to 700 H. P. and non-releasing gear Corliss engines of the high speed type, single cylinder and cross compound from 125 to 1,200 H. P.

General

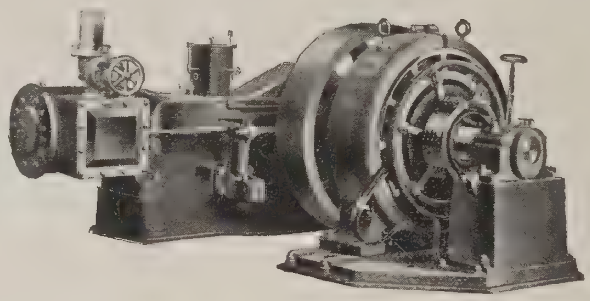
The Ball Engine has been recognized for many years as a standard for any work requiring an efficient and reliable power unit. Excellent design and construction have helped to build up a record of service unexcelled by any other similar machine. Hundreds of these engines are in daily operation in the coal industry, where the importance of reliability is keenly felt, and where the Ball Quality of service is heartily appreciated.

Construction

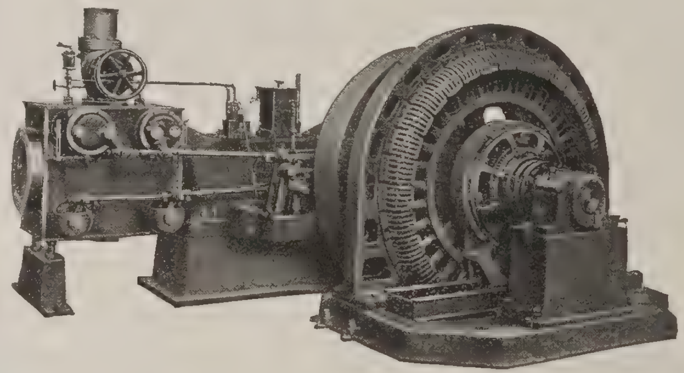
The Side Crank construction has been adopted because of its superior adaptation to conditions met in service. This construction eliminates the necessity for three bearings in engines direct connected to generators, and avoids the undesirable feature of an overhanging wheel which is particularly objectionable in the case of belt drives and in alternating current work.

The various details are substantial in design and material, and simple adjustments are provided wherever necessary.

The oiling system furnishes a reliable means of supplying oil to the bearings in any quantity desired. Adjustable sight feeds are provided for each bearing, and these are fed from a filter tank mounted on the top of the frame. A valveless pump of a special type which cannot be choked by waste or foreign substances, automatically pumps the used oil from the crank pit into the filter tank.



The Single Valve type of engine is extremely simple in construction, and, of course, lower in first cost than the Corliss type. It is largely used where simplicity of operation and low first cost are more important than low steam economy.



The Ball non-releasing gear Corliss Engine was introduced more than ten years ago, and is firmly established as an engine of exceptional economy and reliability. Its smooth operation, close regulation, and its characteristic faculty of "sticking to the job" have built up a considerable demand for this type in the coal field, as well as in many other industries where the service requirements are exacting.

KERR TURBINE COMPANY

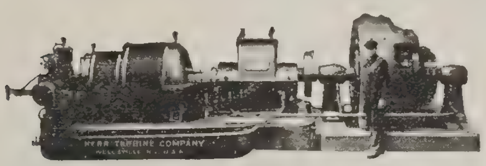
Works and Home Office
WELLSVILLE, N. Y.

Offices In All
Large Cities.

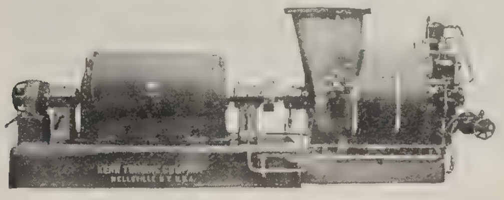
Manufacturers of

"Kerr Economy" Steam Turbine

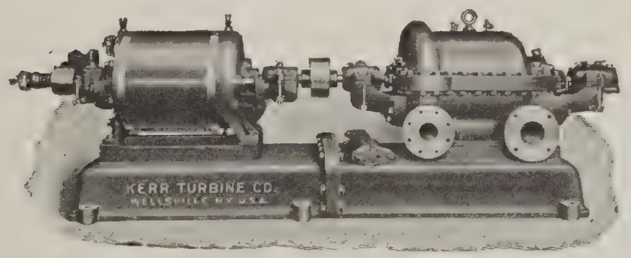
Connected Direct or Through Highly Accurate and Quiet "Kerr Economy" Herringbone Reduction Gears to Generators, Pumps, Blowers, Shafting, Etc.



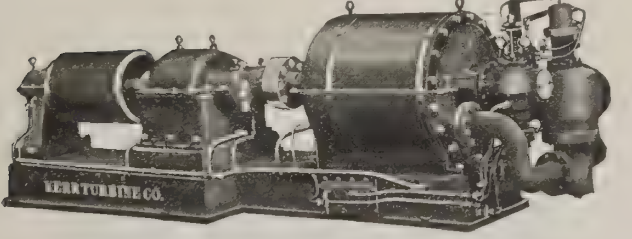
Standard 750 K.W. "Kerr Economy" Geared Direct Current Turbo Generator with Oil Relay and Emergency Governors.



500 K. W. Mixed Pressure "Kerr Economy" Turbo Alternator, built for Rockhill Coal & Iron Co., Robertsdale, Pa.

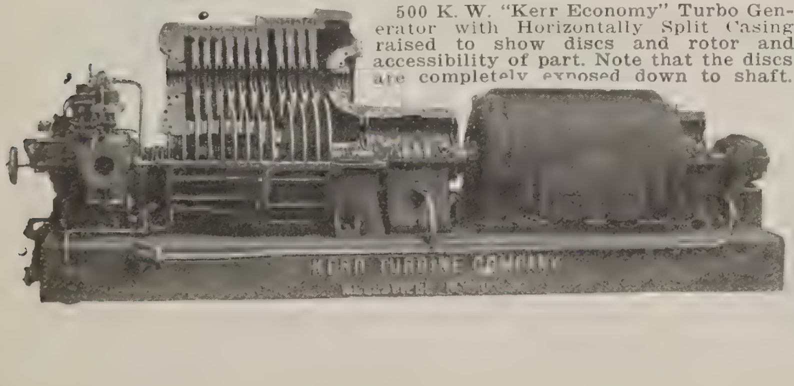


"Kerr Economy" Turbo Boiler Feed Pump.



"Kerr Economy" Geared Turbine for Belt Drive.

500 K. W. "Kerr Economy" Turbo Generator with Horizontally Split Casing raised to show discs and rotor and accessibility of part. Note that the discs are completely exposed down to shaft.

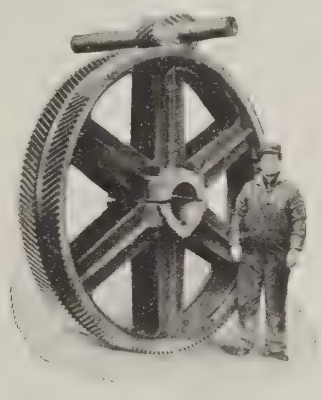


"Kerr Economy" Steam Turbines
combine low first cost and minimum operating expense; require little floor space; are very economic in steam consumption; have practically no vibration, and require little or no attention or repairs.

Built for high pressure service—condensing or non-condensing—up to and including 1500 H. P. (1000 K. W.); also for exhaust steam (low or mixed pressure)—condensing,—and bleeder turbines (combination condensing and non-condensing for extracting part of the steam for heating system or for other purposes, when required, after having done work in non-condensing stages of the turbine.)

"Kerr Economy" Turbo-Generators, Pumps and Blowers
have proven their superiority in coal and metal mining, power and pumping plants, steel plants, etc., and nearly every other industry.

"Kerr Economy" Herringbone Reduction Gears
have proven themselves to be the best, the most quiet, the most accurate and the most efficient built in the United States. They have made possible the use of the "Kerr Economy" Steam Turbine operating at high and most efficient speeds, for driving low speed machinery and for belt or rope drive, as well as in connection with other prime movers driving machinery at other speeds than their own.



"Kerr Economy" Herringbone Reduction Gear.

The demand for "Kerr Economy" products has become so great that it is necessary to build an extension to our factory, which will more than double our manufacturing capacity.

RIDGWAY DYNAMO & ENGINE CO.

BUILDERS OF

POWER PLANT EQUIPMENT

MAIN OFFICE AND WORKS

RIDGWAY, PENNSYLVANIA

Branch Offices and Agencies:—

Boston, 53 State St.
New York, 38 West 32nd St.
Philadelphia, Real Estate Trust Bldg.
Wilkes-Barre, Second National Bank Bldg.
Washington, Colorado Bldg.
Atlanta, Walton Bldg.
Pittsburgh, Oliver Bldg.

Cleveland, Schofield Bldg.
Chicago, Marquette Bldg.
St. Louis, Chemical Bldg.
Denver, Boston Bldg.
Minneapolis, Pocock & Pollard, Iron Exchange.
Seattle, Hallidie Machinery Co.
New Orleans, Electrical Appliance Co.

Products

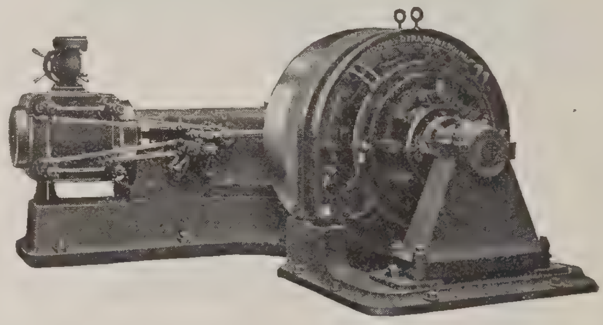
Steam Engines (Horizontal), Single-Valve Type, Side and Center Crank; Four-Valve Type, Side Crank; All Engines Built Simple, Tandem or Cross Compound. Generators, Direct and Alternating Current Types, Belted, Direct Connected, and Coupled. Motor-Generators, Boosters, and Balancers. Steam Turbines (Horizontal) High, Low, and Mixed Pressure with Direct and Alternating Current Generators and Blowers.

General

Ridgway Power Plant Equipment is recognized as a standard for Mining Work. This is due to several reasons, among which are 20 years' experience in building such equipment, a complete line of standard Engine-Generator Units especially designed for that work, and an organization of engineers and salesmen which is constantly looking out for the best interests of the user, even after the equipment has been accepted and paid for. Since the complete unit is the product of a single factory, there is no divided responsibility with its attendant troubles.

Engines

Ridgway Side Crank Engines, Single and Four-Valve Types, are fully enclosed and splash oiling. The main bearings are quarter boxes with wedge adjustment. The connecting rods have solid ends with phosphor bronze boxes, babbitt lined on the crank end. The cross head bodies are made of cast steel with babbitt faced shoes. The governor is of the centrifugal-inertia type and represents the highest development of the shaft governor.



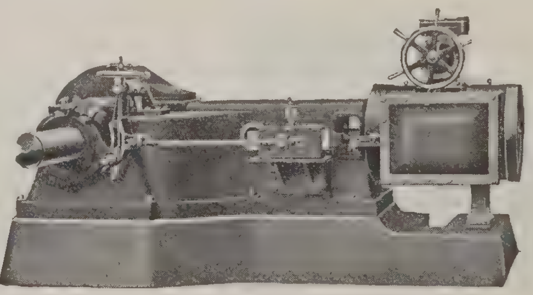
Four-Valve Engine, Direct Current Generator.

Single-Valve Engines have a flat balanced valve with double admission and exhaust edges.

Four-Valve Engines have semi-rotary, semi-balanced, double-ported valves. The valve gear is extremely simple and the principal moving parts run in oil. The motion of the valves is the same as on Corliss engines with the resulting high economy, augmented by careful design and workmanship. This engine has a distinct place in mining operations, where high economy and simplicity are desirable.

Engines of all types are built for belted, direct connected and coupled service. A special line has been developed for driving mine fans, pumps and similar service. These engines are fitted with an adjustable cut-off gear controlled by hand, fly-ball governor, or pressure cylinder. With any of these engines the speed may be adjusted at any time, and with the fly-ball governor the Engine will maintain its speed under varying load or steam pressure.

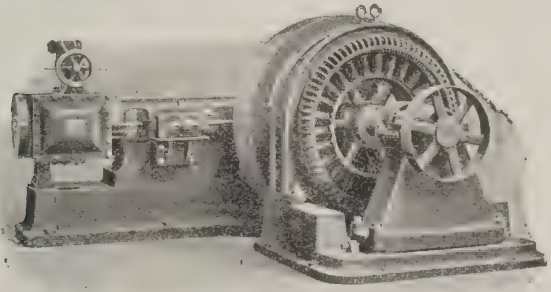
Single-Valve Engine, Direct Current Generator.



Fan Engine with Hand Adjustable Cut-off Gear.

Direct Current Generators

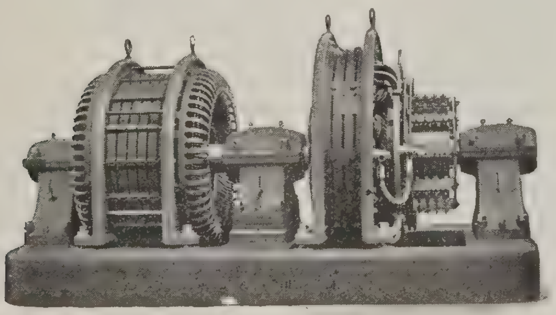
Ridgway Direct Current Generators are provided with a compensating field winding, making them capable of handling the most extreme overloads without sparking. For mining work where load fluctuations are severe and sudden they are without an equal. The field is of laminated construction throughout and responds almost instantly to changes in the magnetizing current. This feature means better regulation than is possible with a cast iron or cast steel field. Three-wire generators are built from the two-wire designs with but slight changes in the connections.



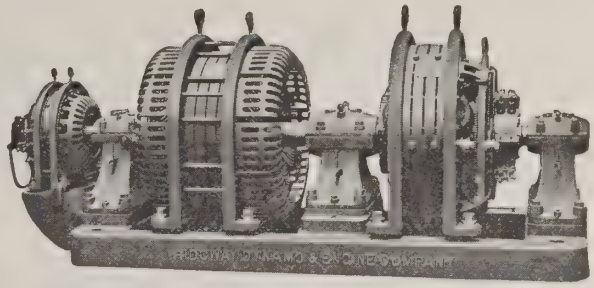
Single-Valve Engine, Alternating Current Generator.

Alternating Current Generators

Ridgway Alternating Current Generators are built according to the latest ideas for such machinery. All sizes are built with revolving fields, having strip wound field coils on the large machines and wire wound coils on the small. The armature core is clamped between heavy cast iron rings in such a way as to leave the core exposed, thereby securing the maximum ventilating effect. Alternators are wound single, two and three phase, for 25 or 60 cycles, and for the usual standard voltages. The line covers direct connected, belted, and coupled or water wheel type machines.



Induction Motor-Generator Set.

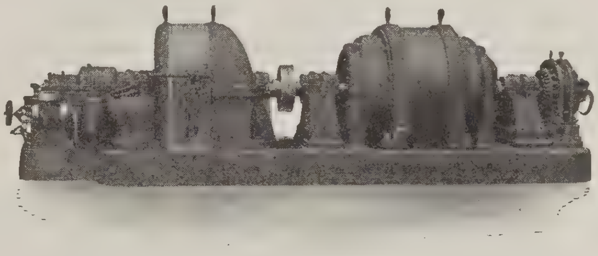


Synchronous Motor-Generator Set with Exciter.

Motor-Generators

The increasing use of central station power in mining and other operations has created a demand for motor-generator sets of various characteristics, and especially for transforming alternating to direct current.

Ridgway Direct and Alternating Current Generators combined into Motor-Generators possess all of the good features of the separate machines, and make a set having the highest possible efficiency and the most satisfactory operating performance. Combinations can be made of self-starting synchronous motors with or without separate exciters, induction motors, direct current two and three-wire generators, series boosters and direct current motors. Sets with synchronous motors can be arranged to operate with either end acting as the motor.



Turbo-Generator Sets

Ridgway-Rateau-Smoot Turbines with Ridgway Direct and Alternating Current Generators embody the latest improvements in the design of such machinery.

Particularly successful in mining plants, and where an increased power output, with no increase in boiler equipment, is desired. High, low and mixed pressure types. 250 K. W. to 3000 K. W.

Sizes

Simple Engines, Single Valve:—15 H. P. to 1000 H. P.

Simple Engines, Four-Valve:—75 H. P. to 1000 H. P.

Cross Compound Engines, Single or Four-Valve:—125 H. P. to 1500 H. P.

Tandem Compound Engines, Single or Four-Valve:—100 H. P. to 750 H. P.

Direct Current Generators, Engine Type:—10 K. W. to 750 K. W.

Direct Current Generators, Belted Type:—3 K. W. to 750 K. W.

Motor-Generator Sets, All Combinations:—5 K. W. to 1000 K. W.

W. K. MITCHELL & CO., INC.

PHILADELPHIA, PA

Steam Engineers and Contractors

Products

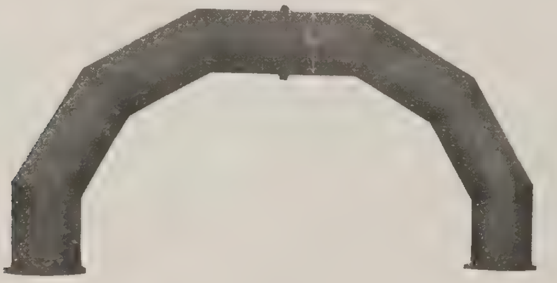
We manufacture and install the complete piping for power plants of every description.

A fully equipped shop with all modern appliances situated to command the best of shipping facilities.

A complete stock at all times of pipe, flanges and all material entering into piping work.

Pipe Bends in Steel, Iron, Brass and Copper

The advantages of using Bends in Pipe Lines of every description are so apparent that a mere reference to them is all that is necessary.



1st. They are stronger than fittings.

2nd. There is no reduction ofpressure due to friction. Steam travels through a Bend as readily as through straight pipe.

3rd. They tend to reduce the number of joints.

4th. They can be arranged to take care of expansion and contraction of lines without the use of troublesome slip Expansion Joints.

5th. They are not as expensive as the Fittings which would be required to take their place.

6th. By reducing Friction and troublesome joints they increase the efficiency of the piping system.

Use Bends wherever possible.

Steam Trap High and Low Pressure.

Our trap has been recently improved and is now the best trap for use with either High or Low Pressure Steam Lines.

It is a positive float trap and the valve opens only when there is a quantity of water to discharge and closes tight as soon as the trap is emptied.

The Valve and Seat are made of the hardest metal, so as to reduce the wear to a minimum.

When the Trap is open the Valve is drawn into a guide, so that it is protected from the rush of water.

By closing the Free Blow-Off Valve the float is depressed and the Discharge Valve is opened wide so that any dirt can be blown from the valve seat.

Nothing has been left undone to make this trap efficient, durable and satisfactory in every way.

Wrought Steel Flanged Fittings

Owing to the destructive effect that high temperature superheat steam has on pipes and fittings having very thick sections, and to the fact that cast steel fittings are troublesome on account of blow-holes and otherwise defective castings, we have put on the market a line of WROUGHT STEEL FITTINGS that are not subject to any of the above troubles.

These fittings are made of WROUGHT STEEL throughout, properly welded together by an IMPROVED PROCESS and annealed afterward, thereby removing any structural weakness due to local heating.

They can be made within practical limits and are guaranteed for any working pressure that can be carried on a modern high pressure steam

As fittings are made to order, they can be modified to suit conditions.

Send us your inquiries and we shall be pleased to quote prices.

Welded Steel Steam Separators

The welding up of Steam Separators marks a distinct advance in that branch of the industry. It is well known that rivetted shells, which so far have been found most satisfactory for high pressure, give more or less trouble in time, due to vibration caused by high-speed engines, etc., and it has been found necessary to develop a method by which these separators can be made without seams or joints of any kind.

The use of superheat steam, especially in connection with steam turbine installations, prohibits the use of cast iron separators, and as steel is the only metal found able to withstand satisfactorily the varying temperatures of the modern superheat steam plant, we are able by the use of this method to furnish a separator which is absolutely reliable under all conditions.

The internal baffles can be made in any form desired, nozzles can be welded at any point on the shell, so that unusual conditions can be met without difficulty.

We solicit your inquiries, whether large or small.

National Valve & Manufacturing Co.

General Office and Works
PITTSBURGH, PA.

Cable Address: "Navco"
Western Union Code.

Branch Offices
CLEVELAND CHICAGO INDIANAPOLIS

Manufacturers, Contractors, Power Pipe Materials

Products and Services

Iron and Steel Gate Valves, Fittings and Flanges; Pipe Bends; Welded Header Lines and Fabricated Pipe Work.

Installation of all classes of Piping Systems.

Co-operative Services

Personal attention and supervision of all work; supplying of special charts showing engineering data on saturated and superheated steam; curves giving sizes for steam headers and boiler connections for horse-powers 200 to 10,000, gauge pressures 125 to 300 pounds, velocities 3,000 to 12,000 feet per minute.

APPROXIMATE LOSS FROM STEAM PIPE LEAKS EQUIVALENT TO GIVEN CIRCULAR OPENINGS UNDER AVERAGE CONDITIONS.

Basis: Cost of one (1) H. P. per year of 300 days and 24 hours per day is 38.40.

Gauge Pressure of Steam In Pounds.

Dia. of Opening.	125 Lbs.	150 Lbs.	175 Lbs.	200 Lbs.	250 Lbs.
1-16"	$ 47.00	$ 55.30	$ 63.60	$ 72.60	$ 89.30
1-8 "	186.00	221.00	255.00	286.00	356.00
3-16"	423.00	500.00	578.00	648.00	800.00
1-4 "	756.00	880.00	1020.00	1140.00	1420.00
5-16"	1175.00	1395.00	1600.00	1755.00	2220.00
3-8 "	1550.00	1980.00	2280.00	2580.00	3190.00
7-16"	2300.00	2725.00	3150.00	3520.00	4360.00
1-2 "	3000.00	3530.00	4080.00	5020.00	5660.00
5-8 "	4680.00	5520.00	6360.00	7200.00	8950.00
3-4 "	6770.00	7970.00	9250.00	10330.00	12840.00
1"	12050.00	14200.00	16320.00	17300.00	22800.00

Many power plants have leaks in the various pipe connections equivalent to an opening 3-16" in diameter, which, at 175 pounds pressure, causes a loss of $578.00 per year, which is about 6% on an investment of $10,000.00. (See Chart).

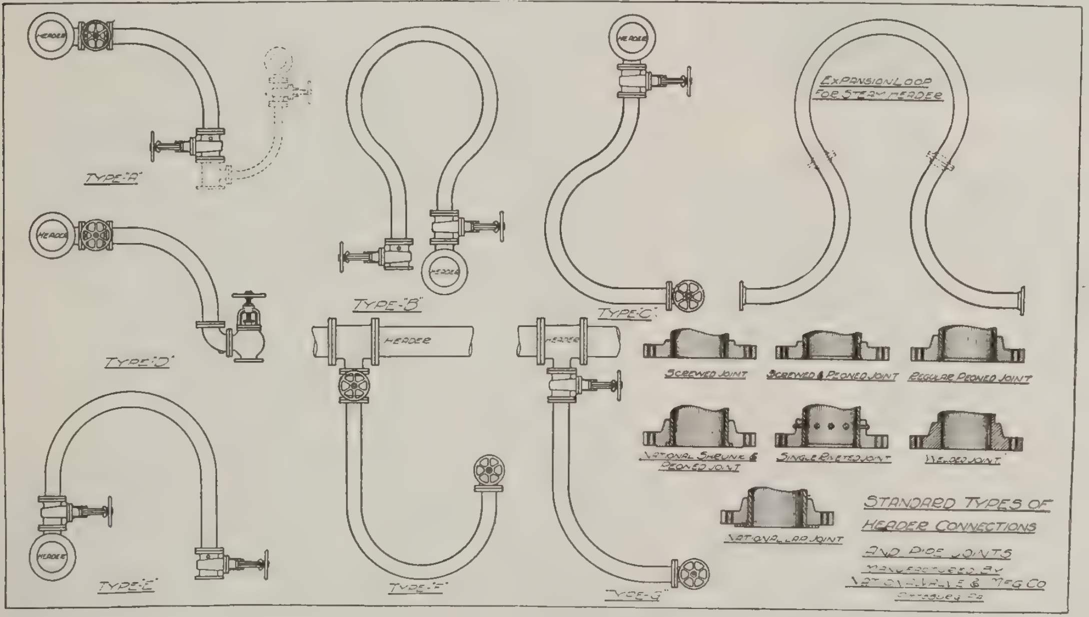


Fig. 2. Standard Types of Header Connections and Pipe Joints.

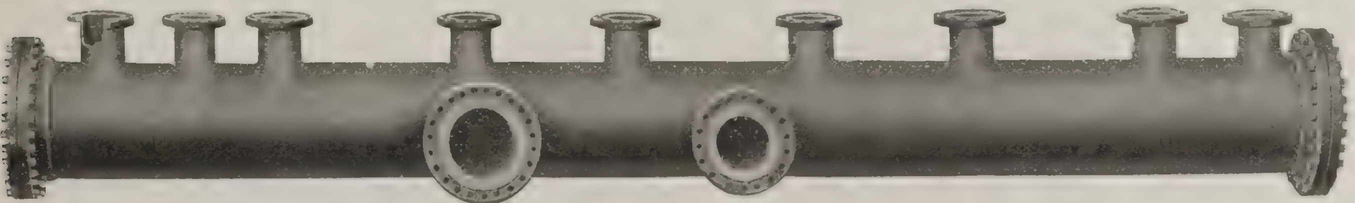
National installations pay large dividends.

Types of Header Connections

The most approved methods of connecting boilers to header and of attaching flanges to pipe are illustrated in Fig. 2. The National square lap joint is recommended; it gives the best gasket surface, a loose or swivel flange and minimum chances for leaks.

Welded Headers

Illustration shows a 24" header with welded nozzles of extra heavy pipe, instead of flanged tees. Companion flanges are attached by means of National Square Lap Joints. In this header 13 joints are eliminated.



24-Inch Header, Nine 8-Inch Nozzles, One 10-Inch Nozzle and One 12-Inch Nozzle.

ARMSTRONG CORK & INSULATION COMPANY

125—24th STREET, PITTSBURGH, PA.

BRANCH OFFICES IN ALL THE LARGE CITIES

Products

Nonpareil Insulating Brick for boiler settings, breechings, furnaces, ovens, etc. **Nonpareil High Pressure Covering** for high pressure and superheated steam lines, feed water heaters, etc. **Nonpareil Corkboard Insulation** for cold storage rooms. **Nonpareil Cork Covering** for brine, ammonia and ice water lines and tanks.

Nonpareil Insulating Brick

Nonpareil Insulating Brick are the most successful insulating material yet devised for reducing the loss of heat by radiation from boiler settings, steam drums, furnaces, etc. Not only are they excellent nonconductors of heat, but they also have structural strength and the ability to withstand relatively high temperatures. Their convenient brick form makes them especially well suited for installing in walls and arches, bonding the courses of Insulating Brick with the fire brick and common brick.

Boilers insulated with Nonpareil Insulating Brick, H. J. Heinz Company, Pittsburgh, Pa.

Composition

Nonpareil Insulating Brick are composed principally of diatomaceous earth. This peculiar material is practically pure silica and is composed of the shells or skeletons of microscopic plants that grew in the sea ages ago. It is estimated that there are 39 billion of these shells to the cubic inch, each one hollow and filled with air. In making Nonpareil Insulating Brick, the diatomaceous earth is mixed with finely ground cork, molded into proper form and then fired. The cork is burned out, leaving the brick extremely porous in structure.

Insulating Value

"Dead air," or in other words, air that cannot circulate, has long been recognized as the best insulating medium known (except a vacuum). As Nonpareil Insulating Brick contain not only the "dead air" confined in the diatomaceous earth, but also that in the pores formed when the cork is burned out, their insulating value, or ability to hold in the heat, is exceptionally high. Repeated tests have shown this insulating value to be ten times that of fire brick or red brick. In other words, one 4½-inch course of Nonpareil Insulating Brick built in the walls of a boiler setting will cut down the heat-loss as much as 45 inches of fire or red brick. The saving which results will, under average conditions, be large enough to pay for the brick in less than a year even when using very cheap fuel.

Size

The standard straight brick are nominally 9 x 4½ x 2½ inches, and weigh about 1½ pounds each. Various other shapes for arches, circles, etc., are also carried in stock. For the purchaser's protection, each brick is stamped with the trade-mark, "NONPAREIL."

Further Information

Full size sample brick, literature, prices and further information will be furnished on request.

Nonpareil High Pressure Covering

Nonpareil High Pressure Covering is also made of diatomaceous earth, combined with asbestos fibre, and here again the remarkable heat insulating value of the former material is demonstrated.

Advantages

Compared with other coverings, Nonpareil High Pressure Covering is not only a better nonconductor of heat, but will withstand much higher temperatures without calcining or disintegrating. It is particularly well suited, therefore, for the insulation of superheated steam lines. Moreover, it will bear repeated wetting and drying without injury, and for this reason is an ideal form of covering for underground steam lines and those which come in contact with excessive moisture.

Application

Nonpareil High Pressure Covering is easy to apply and is furnished in sectional and block form of various thicknesses, and also in plastic cement form.

Further Information

Samples, prices and further information furnished on request.

Nonpareil High Pressure Covering on steam lines and feed water heater.

Nonpareil Corkboard

Nonpareil Corkboard is the world's standard cold storage insulation. It is made entirely of pure granulated cork, compressed and baked in boards 12 inches wide, 36 inches long and 1, 1½, 2, 3, 4 and 6 inches thick. Literature and sample on request.

THE PERMUTIT COMPANY

30 East Forty-Second Street
NEW YORK, N. Y

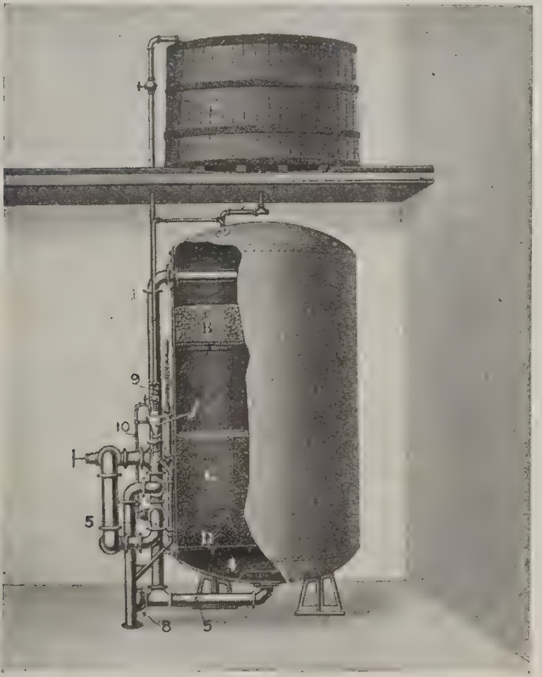
BRANCH SALES OFFICES:
Buffalo, N. Y. Chicago, Ill. Cincinnati, O. Detroit, Mich. Indianapolis, Ind. Jacksonville, Fla.
Los Angeles, Cal. Minneapolis, Minn. Philadelphia, Pa. St. Louis, Mo. Syracuse, N. Y.

Water Softening and Iron Removal Apparatus

Products

Complete Water Rectification Equipment for softening and iron removal and also for the removal of other minerals, suspended water, color, objectionable odors, gases and tastes.

(a) **Softening.** "Permutit" Water Softening Filters soften water by simple filtration through a bed of artificial zeolite contained in a filter shell, as shown in illustration. No chemicals are added to the water, there is no sludge to be disposed of.



A Permutit Water Softening Filter.
A—Salt Solution Tank.
B—Upper Layer of Gravel.
C—Layer of Permutit.
D—Lower Layer of Gravel.

The softened water is always zero (free from calcium and magnesium, incrusting solids), because changes in the hardness of the raw water up to the maximum for which the filters are designed are automatically taken care of. The "Permutit" Process thereby eliminates the most serious objection to the chemical types of water softeners, the prevalent under or over treatment. After the filter has delivered its guaranteed capacity of perfectly softened water, it is regenerated and restored to its original softening capacity by soaking the artificial zeolite in a brine of common salt (sodium chloride). This brine is afterwards run directly to waste, carrying off in solution the previously absorbed lime and magnesium; simple valve control takes care of these functions. The brine and waste waters are perfectly clear liquids. There is no sludge of any character to be disposed of.

(b) **Iron Removal.** Depending on the conditions peculiar to each case, we design the iron-removal plant. We offer either the pressure or gravity type, using chemical or simply mechanical processes as the conditions require. We have developed our Iron Removal Filters to a high state of perfection, and, as with the Water Softening Filter we guarantee zero hardness water, so we can offer equipment that will automatically deliver "Free-From-Iron Water."

General

It is obviously impossible to detail the various kinds and arrangements of water rectification equipment. We, however, undertake to treat in a simple and most efficient manner any water and to produce a water suitable for the required purpose.

Guarantees

(a) No scale or mud in boilers, heaters, pumps, pipe lines, etc.

(b) A water perfectly clear, free from turbidity, and so free from iron that it will not grow cloudy on standing.

Note

We solicit your inquiries, cheerfully send literature, and furnish estimates and sketches when requested.

PITTSBURGH FILTER MANUFACTURING CO.

GENERAL OFFICE, PITTSBURGH, PA.

Branch Offices, Kansas City, Mo.

Pressure and Gravity Filters, Water Softening Plants

Description of Pittsburgh Gravity Filters

These filters are built in sizes from five to twenty feet in diameter, when built of wood, or constructed of steel, but are usually built of rectangular shape when constructed of concrete. They are most suitable for small cities, hospitals, public institutions, paper mills or other industrial purposes where considerable quantities of water are required.

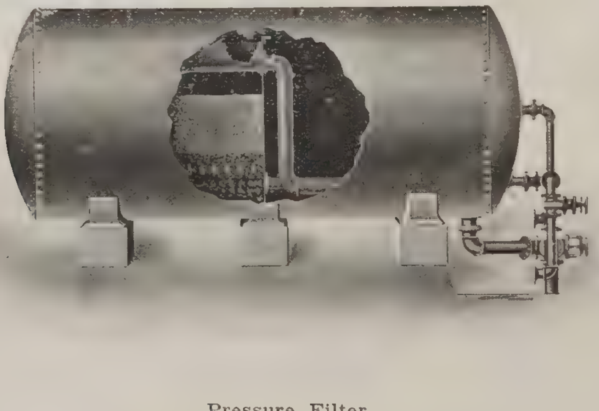
Gravity Filter.

They are equipped with the best type of gate valves, controlling the inlet, outlet, and wash-water supply. The inlet is supplied with a controlling float valve to regulate the supply to filter, and the outlet controlled by an automatic rate controller when required.

We build these filters equipped with the standard rake agitator operated by gears and belts or with our system of air agitation as may be most convenient or desirable. With our system of air-wash the air may be used at the same time as the wash-water or independently, as desired.

We build this filter in the belief that it is the most perfect in design and construction, simplest in operation, most efficient in results of any of its type on the market.

Prices on application.



Pressure Filter.

Intermittent Water Softener.

Types of Plant

We build several different types and designs of plants, each having their peculiar points of advantage for certain conditions. Our long and varied experience enables us to design plants to meet any peculiar local conditions, embracing such features as will give the most satisfactory results at the least cost for installation and operation.

We build both the Intermittent and Continuous Process plants, for either hot or cold water, of steel, wood, or concrete construction, of any capacity required from a few thousand gallons daily capacity to millions of gallons.

Our plants are designed with a view of combining the very highest efficiency with the greatest simplicity in care and operation. Our capacities are generous, providing ample elasticity and the construction of the best type of material and workmanship of their respective kinds.

If you desire a plant for Railroad Water Station use, industrial or municipal purposes, do not fail to consult us. We will make analysis of your water and recommend the type of plant best suited to your needs.

Concrete now so generally used in the construction of municipal plants is becoming more and more the standard of permanent construction.

We are prepared to design and construct both the intermittent and continuous type of plant in concrete.

We build but one kind—The Best.

WM. B. SCAIFE & SONS COMPANY

FOUNDED 1802

PITTSBURGH, PA.

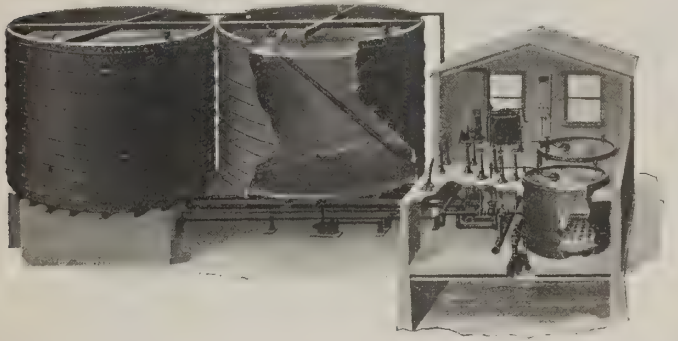
Water Purification for All Purposes

Softening and Filtration Systems

Our Water Purifying Systems are designed to meet the specific requirements of each case. We guarantee definite results and specialize in furnishing apparatus for purifying water for boiler feed and domestic use with a single installation meeting the requirements of State Boards of Health.

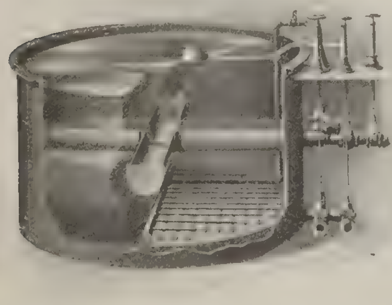
The WE-FU-GO System (Intermittent).

In this system measured quantities of water are treated, therefore accuracy of treatment can be maintained and a uniform soft and clear water obtained, regardless of either the impurities in the raw water supply, or the variations in its quality, and the rate at which the purified water is used. This system meets every requirement for the perfect neutralization of acids, and the softening and clarification of water for both boiler feed and domestic purposes. The reaction and settling tanks act as storage tanks, in which a very considerable volume of water is carried that is available for irregular demands. There are no complicated mechanisms or adjustments, and the system can be efficiently operated with common labor of ordinary intelligence.



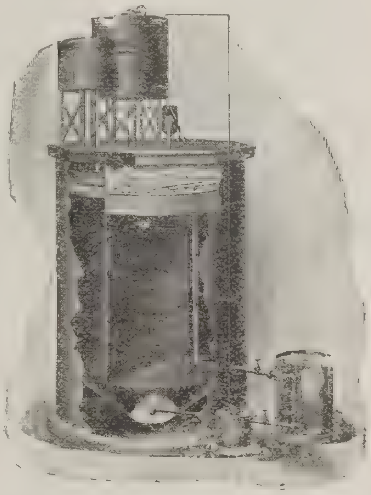
Mechanical Gravity Filters

These filters are of the open tank type built in suitable units for any desired capacity. A complete mechanical gravity filter system includes an automatic coagulant feeding device, sedimentation tank, filter completely equipped, a rate controller on outlet from filter, a loss of head gauge on filter, and in special cases necessary apparatus for introducing a sterilizing reagent. These filters are adapted for all conditions requiring only removal of iron and suspended matter or bacterial purification.



Syphon System (Continuous)

An automatic system not dependent upon moving mechanical devices for reagent introduction. The water entering the system flows into a receiving tank to which is connected a syphon; into the long leg of which are connected small syphons which introduce the reagents in direct proportion to the discharge of the main syphon. The harmonious action of these syphon depends only upon the periodic rise of the water to the same height in the syphon tank and emptying to a fixed depth; therefore its accuracy is not affected by the rate at which the water enters the system.

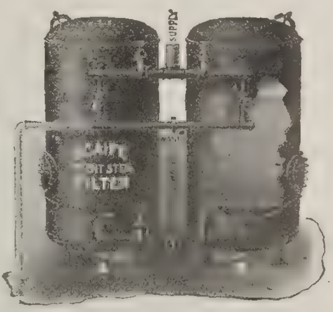


An efficient filter to insure perfect clarification is included; this filter is washable without contaminating the water in the settling tank.

This system can be arranged to operate from the ground or on top, and can be modified for special requirements.

Pressure Filters

These filters are designed to operate with water under pressure and are built in suitable sizes for any desired capacity and pressure. They are usually built vertical in sizes up to 96 inches diameter, for large capacities they are built horizontal. These filters are adapted for the clarification of water, for offices, dwellings, swimming pools, etc., where space is limited.



Some Coal Mine Installations

- Consolidation Coal Co., Jenkins, Ky.
- J. H. Sanford Coal Co., Raccoon, Pa.
- Carnegie Coal Co., Oakdale, Pa.
- Northwest Coal Co., Simpson, Pa.
- United Coal Co., Meadowlands, Pa.
- Oak Ridge Coal & Coke Co., Hastings, Pa.
- Pittsburgh & Baltimore Coal Co., Wendell, Pa.
- Bulger Block Coal Co., Bulger, Pa.
- Fayette Coal Co., Noblestown, Pa.
- New River & Pocahontas Cons. Coal Co., Minden, W. Va.
- Keystone Coal & Coke Co., Madison, Pa.
- Pennsylvania Coal & Coke Corp., Cresson, Pa.
- B. F. Berry Coal Co., Standard, Ill.
- Atlantic Crushed Coke Co., New Derry, Pa.
- United States Coal & Oil Co., Holden, W. Va.
- Youghiogheny & Ohio Coal Co., Wyano, Pa.
- Allegheny River Mining Co., Seminole, Pa.
- Pittsburgh Coal Co., Hills Station, Pa.
- Ford Collieries Co., Curtisville, Pa.
- West Kentucky Coal Co., Sturgis, Ky.
- W. J. Rainey, Uniontown, Pa.
- Consolidation Coal Co., Acosta, Pa.
- Pittsburgh Coal Co., Jacobs Creek, Pa.
- The Provident Coal Co., St. Clairsville, O.

Sterling Equipment and Supply Co.

315 Cherry Street
PHILADELPHIA, PA.

Manufacturers of

"Sesco" Vegetable Feed Water Treatment

Guarantee

"Sesco" is sold guaranteeing satisfactory results.

Sesco is gauranteed to prevent the formation of scale and to losen the scale now on shell and tubes so that it can be removed by you.

Sesco will not carry over in the steam nor will Sesco neutralize the lubrication of the valves of your engines and pumps.

Sesco will prevent pitting and corrosion, foaming or priming.

Sesco will not injure the tubes, valves, packing, gaskets, pipe-line joints or any part of boilers or connections.

If at the expiration of test you are not satisfied, with the results obtained by the use of Sesco there will be no charge for the material furnished.

Smith, Rudy & Company
Metallurgists and Foundry Specialists
Analytical Chemists
411 Walnut St.
Philadelphia.

We, the undersigned, hereby certify to the following facts concerning "Sesco" Boiler Feed Water Treatment.

We have examined and analyzed this material and find it to be free from acids, alkalies, or other ingredients that would corrode or injure a boiler or connections.

We know its composition and consider it to be an excellent feed water treatment and a positive preventative of boiler scale.

We make analyses of feed waters from each individual plant on samples furnished by the Sterling Equipment & Supply Company and each individual treatment is prescribed in accordance with the requirements shown by each analysis.

Signed

Smith Rudy & Co
By M. [illegible] Smith

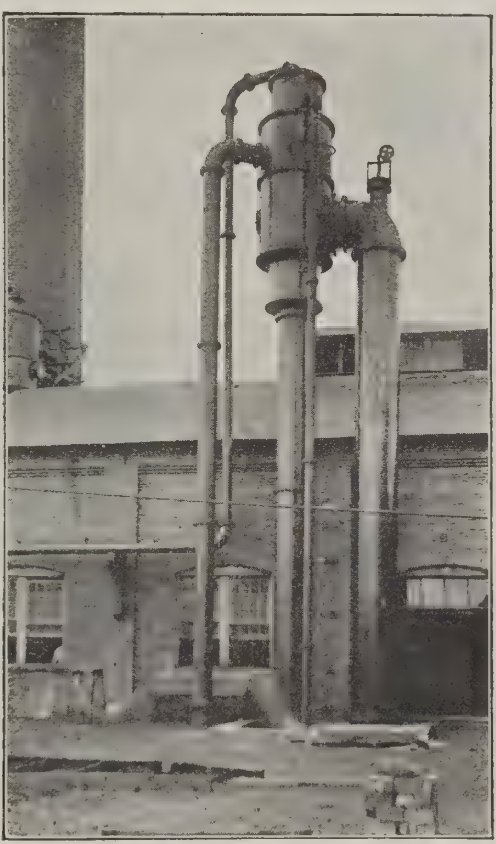
INGERSOLL-RAND COMPANY

11 BROADWAY NEW YORK

Manufacturers of Compressed Air Coal Mining Machinery

Beyer Barometric Condensers

Actual service reports of apparatus installed for various classes of service indicate the superiority of this equipment.



THE BEYER BAROMETRIC CONDENSER is of the counter-current design and possesses features of advantage (some of them patented) that insure reliable and satisfactory operation.

Distinctive Performance

Maximum condensation effect.

Safety of prime movers.

Hot waste water pumps not required.

No springs, contracted orifices or nozzles—therefore nothing to get out of order.

Higher vacuum at exhaust nozzle or prime mover with any given amount or temperature of cooling water.

Action is not affected by the quality of the cooling water.

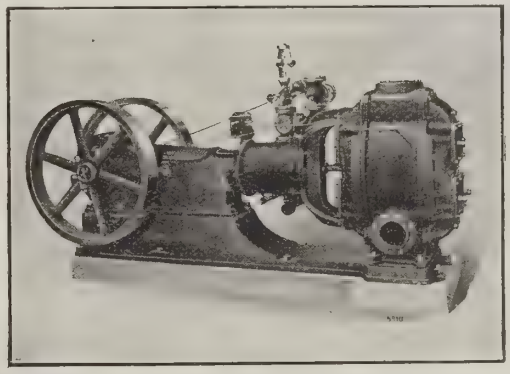
Will handle the exhaust steam from a number of units acting as a central condensing plant.

Bulletin 9024.

"Ingersoll Rogler" Vacuum Pumps

Occupy less floor space than any other type of reciprocating air pump. Their high operative speeds give greater capacity for given size cylinders.

Equipped with automatic air valves—noiseless in operation.



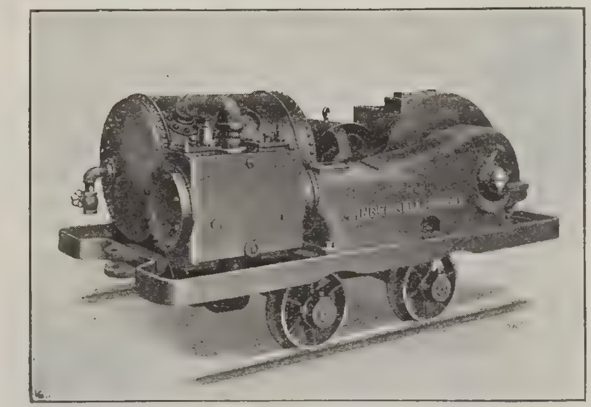
Entirely enclosed construction insures cleanliness and excludes dirt.

Automatic lubrication, requiring only occasional attention, minimizes wear and cuts down attendance cost.

High vacuum capacity—maintained at a low cost.

"Ingersoll Rogler" Mine Car Compressors

In every coal mine there are certain operations which can be done most rapidly and successfully by compressed air drills and cutters.



For the electrically operated mine, a mine car mounted, motor driven, portable compressor supplies compressed air where it is to be used without the expense of a permanent compressor station and extended pipe lines.

The "Ingersoll-Rogler" mine car compressor is especially designed for this service. It is of fully enclosed, dirt-proof construction, is automatically lubricated, automatically controlled, and is fitted with simple durable and highly efficient "Ingersoll-Rogler" inlet and discharge valves.

Bulletin 3015.

HARRISON SAFETY BOILER WORKS

3130 N. 17TH STREET, PHILADELPHIA, PA.
Manufacturers

The Cochrane Finding Chart

For Finding Equipment Which Will Make Your Steam Plant Most Efficient

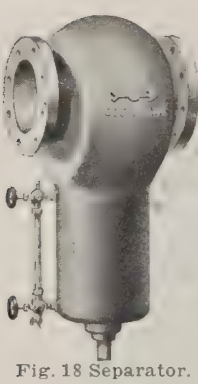


Fig. 18 Separator.

For Purifying Exhaust Steam from engines and pumps, so that it can be used in heating and drying systems, cooking kettles, calendering rolls and low pressure turbines, **Use Cochrane Oil Separators.** See Publication, "Cochrane Separators, Their DDesign, Types and Uses."

For protecting engines and turbines against water, insuring better lubrication with less oil, and protecting the turbines against erosion of blades, **use Cochrane Steam Separators.** See our book on "Cochrane Separators, Their Design, Types and Uses."

Fig. 33 Separator.

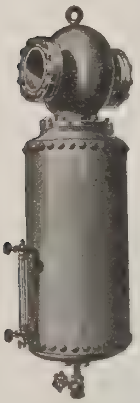
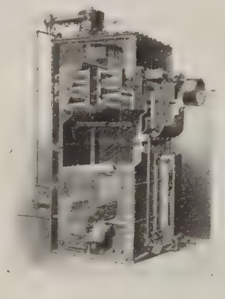


Fig. 5 Separator.

For reducing vibration and pulsation in the steam lines, raising the average pressure in the steam chest, and for getting along with smaller steam lines and fittings, **use Cochrane Receiver Separators,** which have an ample well, both to receive large doses of water, and to supply steam storage close to the engine throttle.

For use in connection with exhaust steam heating or drying systems, combining the functions of feed water heater and independent separator for purifying the exhaust steam used in the radiators and coils, **install the Cochrane Steam-Stack and Cut-Out Valve Heater and Receiver,** which is fitted with a separator large enough to purify all of the exhaust steam in the plant, and with valves by means of which the body of the heater can be cut out of circuit for inspection or cleaning while the separator continues in operation. All about exhaust steam heating systems, with useful tables and data, is given in our "Exhaust Steam Heating Encyclopedia."

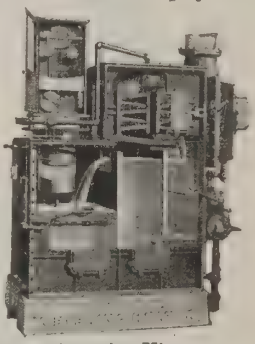
Interior View 700 Series.



Interior View 400 Series.

To save 10% to 15% in your coal by utilizing exhaust steam to heat the feed water, thus also protecting your boiler against temperature strains and air and gases in the water and providing a hot well and an automatic raw water regulator, **use the Cochrane Open Feed Water Heater.** See our catalog on "Cochrane Heaters for the Profitable Utilization of Exhaust Steam."

For finding out how many pounds of steam you get from a pound of coal, so that you can determine the best kind of coal to use, how much it pays to clean scale and soot off tubes, the best methods of firing or draft control, the effects of stopping up air leaks, etc., **install the Cochrane Metering Heater.** It performs all the functions of the standard Cochrane Heater, and besides accurately meters the water. See our book, "Finding and Stopping Waste in Modern Boiler Plants."



Interior View 2700 Series.

For protecting your exhaust steam system against excessive rise of pressure, that is, for protecting heating or drying systems or condensers, **install the Cochrane Multiport Valve.** A number of disks instead of one large disk reduce weight and travel, and hence the tendency to hammer, which is eliminated altogether by an effective dash-pot for each disk. There are no moving parts connected to the disk extending outside the casing, hence no possibility of overweighting, tying down or jamming, as by overtightening of packings. See our book on "Multiport Valves, Their Types and Uses."

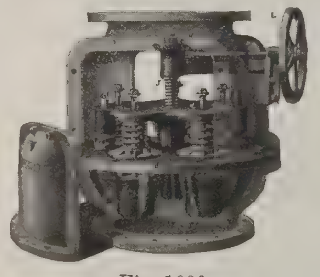


Fig. 1000 Interior View.

For preventing vacuum backing up through the mixed flow turbine to the engine exhaust line and thereby drawing in air to the detriment of the vacuum, **use the Cochrane Multiport Flow Valve,** all explained in the "Multiport Catalog."

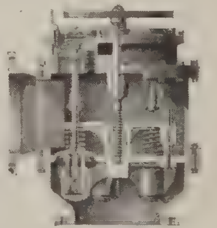
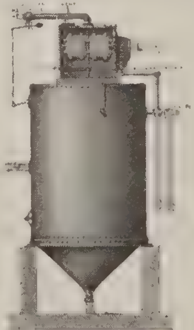


Fig. 1250.

For protecting the boiling against scale and corrosion, and keeping out slude and sediment, while at the same time securing all the advantages of heating the water to the maximum temperature, **install the Sorge-Cochrane Hot Process Water Softener.** Due to the use of heat, smaller apparatus is required than with the cold process, and it can usually be installed in the boiler room without special foundations, which at the same time lessens the cost of piping and connections. No independent feed water heater is required. See our new publication on "Hot Soft Water for Steam Boilers."



Steel Plate System.

COCHRANE ENGINEERING SERVICE

For twenty-five years our organization has devoted itself to the **profitable utilization of exhaust steam.** We have made a specialty of utilizing exhaust steam for heating water for boiler feed and other purposes, and for heating buildings, drying materials, operation of low pressure turbines, also for the softening and metering of water. Our skill and experience are at your service, with no further expense to you than the writing of a letter detailing your present conditions and the making of a simple sketch showing your present layout. Even if you have no pressing problem demanding solution, you may obtain valuable suggestions from the Cochrane literature, as mentioned above under the different headings.

THE SIMS COMPANY

ERIE, PA.

BRANCH OFFICES AND AGENCIES

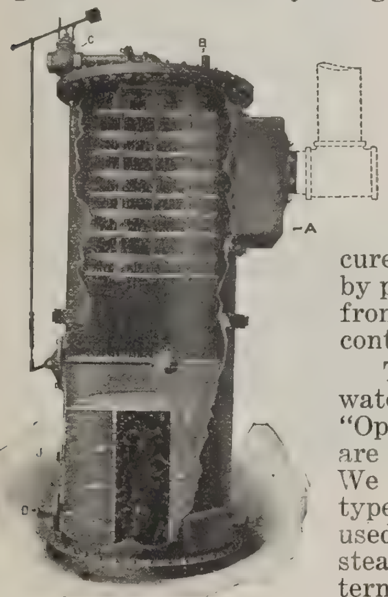
Guy L. Andrews, 1215 Loraine St., Pittsburgh, Pa.
Huntington Supply & Equipment Co., Huntington, W. Va.
B. W. Thurtell, 22 Quincy St., Chicago, Ill.
Manufacturers Sales Co., 255 N. 12th St., Philadelphia, Pa.
Mine & Smelter Supply Co., Denver, Colo.
Henry M. Fife, 1111 Holland Bldg., St. Louis, Mo.
Earl F. Scott, Candler Bldg., Atlanta, Ga.
Moore-Handley Hardware Co., Birmingham, Ala.
C. J. Moulton, Room No. 745 Marbridge Bldg., New York City

Manufacturers of Power Plant Appliances

Products

Feed-Water Heaters, Steam Separators, Exhaust Heads, Oil Filters, Etc.

Feed-Water Heating



Open Type.

The value of a feed water heater as a fuel and boiler saver need no longer be argued. **Every 11 degrees of heat saved by using exhaust steam represents a saving of 1 per cent of fuel,** or the increase of boiler capacity to the same extent. Large increase in the life of the boiler and large reduction in repairs are secured at the same time by prevention of strains from expansion and contraction.

Two types of feed-water heaters — the "Open" and "Closed"— are generally known. We manufacture both types. The kind to be used in any particular steam plant must be determined by local conditions. Design and construction of our heaters are the outcome of many years' experience in the manufacture of steam appliances. The most exacting and scientific engineers will recognize them as thoroughly up-to-date, representing the highest type of engineering and manufacture—the product of the best material, the latest tools, and the most skilled workmen. Our works are situated at a good distributing point, assuring the most favorable rates of freight.

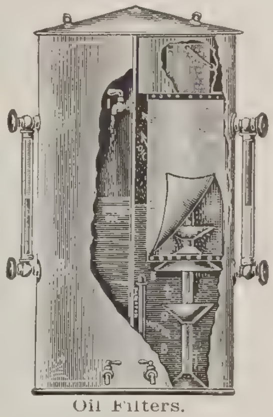
Closed Type.

Sims Open Feed-Water Heater Filter and Purifier

Renders the additional service of removing earthy matter, carbonate of lime, and similar impurities. Made round, to resist accidental or occasional back pressure; of cast-iron, which is not subject to corrosion; with every part accessible for cleaning. Perforated saucers suspended from bolt hooks give excellent distribution of the water, either through the perforations or in a thin veil around the edge, thus enabling the water to absorb every possible unit of heat from the incoming steam.

Filtration is cross-current through coke, with automatic float regulation and overflow trap. Blowing down the mud chamber reverses the water current and automatically cleans the filter. A vent pipe at the top may be carried back to the exhaust or elsewhere so the heater cannot become airbound. An oil separator of scientific construction entirely prevents carrying over any grease. A hand hole and blow-off connection are provided in the mud chamber; water gauge and thermometer are supplied with each heater. Listed in 14 sizes, 50 to 4,000 horse power, larger sizes as may be required.

Oil Filters

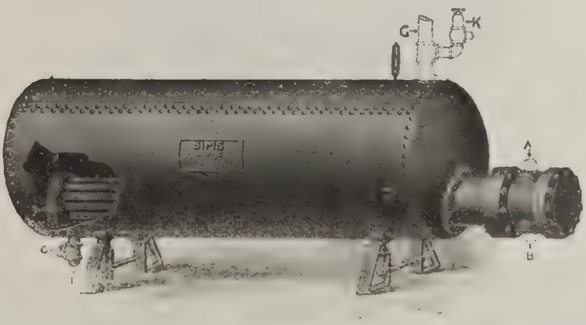


Oil Filters.

Oil costs good money—saving fifty or sixty per cent on the lubricating oil used in the engine room, would be quite an item—it can be done by investing a small amount in a Sims Filter—get our circular showing sizes and filtering capacities. Send in your order for a 30 days trial —we know it will stay.

"Clean E-Z" Heaters for Miner's Wash House

Take a bath before leaving the mine property—Required by law in many States. When providing suitable wash houses and facilities for the comfort of employees, use a Sims Storage Type "Clean E-Z" Heater—as illustrated—made in sizes and heating capacity to suit any conditions. Tell us what you need, number of gallons per hour, steam pressure, exhaust or live steam, and we will submit a proposition with guarantee of satisfactory service. If you have a storage tank, we can furnish a circulating generator to connect with it. Write us!



"Clean E-Z" Heaters For Miner's Wash House.

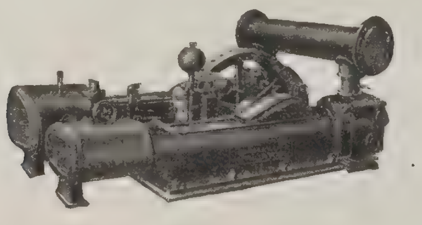
INGERSOLL-RAND COMPANY

11 BROADWAY NEW YORK

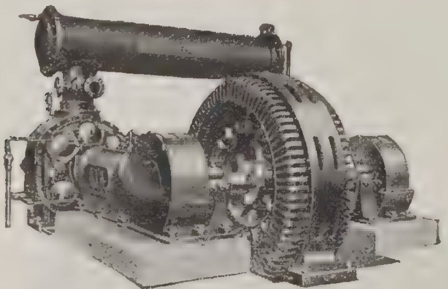
Manufacturers of Compressed Air Coal Mining Machinery

Air Compressors

To operate economically, the coal mine must at once provide for the economical production of power, as well as its utilization. Waste in power consumption and a loss of output, incident upon breakdowns, are costly items and will offset everything that may be gained through the use of otherwise highly efficient machinery.



"Imperial" Duplex Compressors—Capacities from 176 to 3620 cu. ft. per minute.
Type "XPV"—Steam Driven. Bulletin 3033.
Type "XB"—Power Driven. Bulletin 3312.

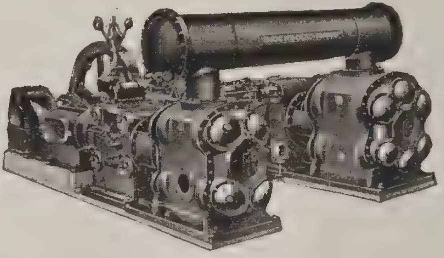


"Ingersoll-Rogler" Class "PRE"—Duplex, Direct Connected, Electrically Driven Type. Capacities 1000-10000 cu. ft. per minute.
Bulletin 3026.

Ingersoll-Rand compressors have proved, beyond a doubt, that they are economical in the production of power, low in maintenance cost, highly efficient and thoroughly dependable in service.

For ordinary service there are standard 100 pound machines, built in more than 150 sizes, from 3 to 10,000 cubic feet capacity. Reciprocating machines, both straight line and duplex, may be had power, short belt electric, direct connected electric, piston valve or Corliss valve steam engine driven. Turbo types may be had live or mixed pressure steam turbine driven.

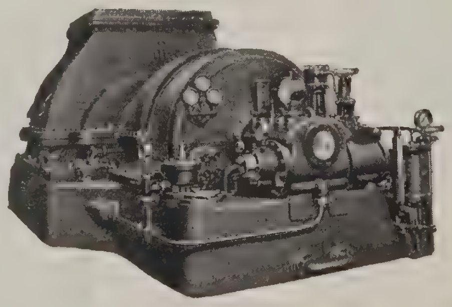
For high pressure work, such as compressed air haulage systems, compressors of two, three and four stages, delivering air at pressures up to 2500 pounds, are available.



"Ingersoll-Rogler" Class "ORC"—Duplex, Corliss Steam Engine Driven Type. Capacities 2500-10000 cu. ft. per minute.
Bulletin 3029.

You Can Depend On Ingersoll-Rand Compressors

Turbo Blowers for blast furnaces, cupola work, Bessemer converters, etc., may be had steam turbine or motor driven in capacities up to 60,000 cubic feet.



Ingersoll-Rand Turbo Compressors and Blowers, Cupola Blowers and Gas Exhausters.
Full information upon request.

Ask for the Bulletins.

WESTINGHOUSE AIR BRAKE CO.

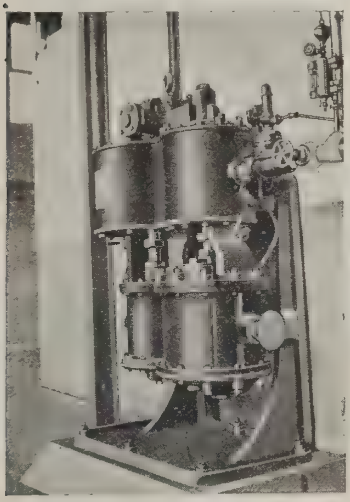
WILMERDING PA

Offices:

Atlanta	Candler Building
Boston	Exchange Building
Chicago	Railway Exchange Building
Columbus	Columbus Savings and Trust Building
Denver	Tramway Building
Houston, Texas	4802 Main Street
Los Angeles	Pacific Electric Building
Mexico City, Mexico	4a Puente de Alvarado, No. 100
New York	City Investing Building
Pittsburgh	Westinghouse Building
Portland, Ore.	Spalding Building
St. Louis	Boatmens Bank Building
St. Paul	Endicott Building
Salt Lake City	McIntyre Building
San Francisco	Pacific Building
Topeka	New England Building

Coal Operators and Contractors

Have found Westinghouse Compressors ideally adapted to the mining industry. Built especially for the railroad brake service, these compressors necessarily embody extreme simplicity in design, absolute reliability in action, durability, compactness, efficiency and low maintenance expense. Combined with these features these machines possess a neat, attractive appearance, occupy little floor space, and may be installed at a minimum cost. Being automatic in operation, they require practically no attention.



Typical Installation of 10½″ Cross Compound Compressor in Power House. Compressor is Shown Mounted on Our Special Stand.

Steam Driven Air Compressors

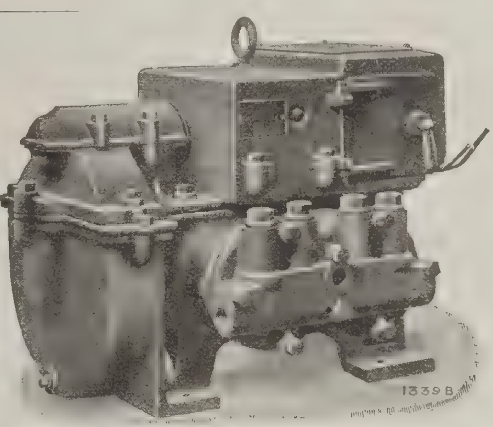
Are furnished in both the single stage and cross compound types. Standard single stage compressors are built in 8″, 9½″ and 11″ sizes, although to meet special conditions these compressors may be equipped with various size air cylinders. The 10½″ Cross Compound Compressor is especially endorsed as having large air capacity and high efficiency and economy in steam consumption.

General Dimensions, Displacement and Weight of Westinghouse Standard Steam-Driven Air Compressors.

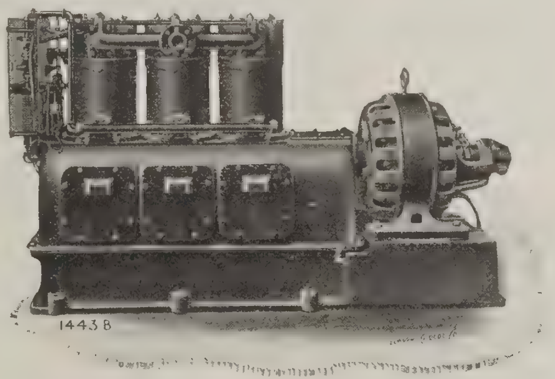
	8-Inch	9½-Inch	11-Inch	10½-Inch Cross-Compound
Diameter of Steam Cylinder	8 inches	9½ inches	11 inches	H. P. 10½ inches L. P. 16½ inches
Diameter of Air Cylinder	8 inches	9½ inches	11 inches	H. P. 9½ inches L P. 14½ inches
Length of Stroke	10 inches	10 inches	12 inches	12 inches
Governor	1 inch	1 inch	1¼ inches	1½ inches
Diameter of Steam-admission Pipe	1 inch	1 inch	1¼ inches	1½ inches
Diameter of Steam-Exhaust Pipe	1¼ inches	1¼ inches	1½ inches	2½ inches
Diameter of Air Admission Pipe	1½ inches	1½ inches	1½ inches	2½ inches
Diameter of Air-Delivery Pipe	1¼ inches	1¼ inches	1¼ inches	1½ inches
Rated Speed, single strokes per minute	120	120	100	131
Displacement at rated speed	35 cu. ft.	49 cu. ft.	66 cu. ft.	150 cu. ft.
Over-all Dimensions	42 5/16″x17¼″x13¾″	42 5/16″x18¼″x14 9/16″	51 5/16″x21½″x15 13/16″	56 13/16″x41 13/16″x21″
Net Weight	450 pounds	525 pounds	850 pounds	1800 pounds
Weight, boxed for shipment	550 pounds	625 pounds	975 pounds	2150 pounds
Lift of Air Valves—Suction	3/32 inch	3/32 inch	3/32 inch	5/32 inch
Discharge	3/32 inch	3/32 inch	3/32 inch	5/32 inch
Intermediate	......	......	......	⅛ inch

Motor Driven Compressors

Such as illustrated, need little introduction, since they are designed after the well-known street car type, the motor being direct connected to compressor through herringbone gear and pinion. They are entirely self-contained units, automatically controlled, efficient, reliable, and economical to operate and maintain. These characteristics have contributed to their entry in almost every industry, and especially the coal fields, where they are used on tipples, in repair plants, mines, etc. They may be furnished for either intermittent or continuous duty, for stationary or portable service, and with either direct or alternating current motors.



Type "H" Motor Driven Compressor with D. C. Motor.



3-VS Motor-Driven Compressor with A. C. Motor. Type "H" for Intermittent Service. All Others for Continuous Service.

Motor Compressor	Piston Displacement, Cu. Ft. per min. at 90 lbs. pressure.	Size of Cylinder in Inches.	Crank Shaft R. P. M.	Motor R. P. M.	H. P. at 90 Pounds Pressure.	Dimensions in Inches. Length.	Width.	Height.	Approximate Shipping Weight, Pounds.
H-1	11	5 x 2½	194	1350	1.75	26¼	20¼	19⅛	630
H-2	16	5 x 4	176	1400	2.6	26⅛	26⅜	22⅜	860
H-3	20	6½x 3	173	1100	3.5	31⅝	23⅛	22½	1090
H-4	28	6½x 4¼	173	1250	5	31⅜	29 3/16	24⅞	1300
H-5	35	7½x 4	172	1175	6.25	35 13/16	26⅜	25⅜	1450
H-6	50	8½x 4	188	1100	9.25	38 11/16	26⅝	25½	1800
E-2	60	8½x 4	226	1325	11	63¾	23¾	39½	2500
E-3	75	8½x 6	188	1100	13.5	67¼	25½	45½	3000
3VS-11	100	7½x 9	145	860	18	87⅞	30	49	5000
3VS-21	150	8½x 9	170	860	27	93	33	50½	6200
3VS-22	225	9¾x10¾	161	860	40	107	38½	60	9000
3VS-23	300	11⅝x11⅛	146	860	54	120¼	40½	62⅜	12500
3VD	550	11 x11⅛	150	700	100	135	48	92	16000

Belt Driven Compressors

Are also supplied for either intermittent or continuous service in capacities ranging from 4 to 75 cu. ft. per minute, and for pressures up to 350 lbs. per sq. in.

Accessories

Include compressor stands, governors for automatic control of compressors, cut-out cocks, gages, reservoirs, switches, steam valves, etc.

American Steam Gauge & Valve Mfg. Co.

Main Office and Works

BOSTON. MASS.

Branch Offices

NEW YORK CHICAGO PITTSBURGH ATLANTA

Products

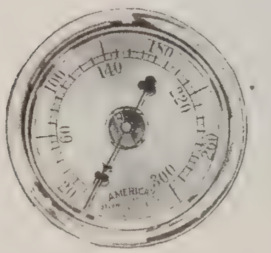
Gauges—Both Indicating and Recording for Steam, Water, Air, Oil, Gas, Hydraulic, Ammonia and all other pressures; also Vacuum and Compound.

Gauge Testers, Engine Room Clocks, Revolution Counters.

Pop Safety and Relief Valves, Steam Whistles, Globe, Angle and Check Valves, Engine Indicators, Feed Water Regulators, Feed Water Grease Extractors, Steam Traps, and Blow-Off Valves.

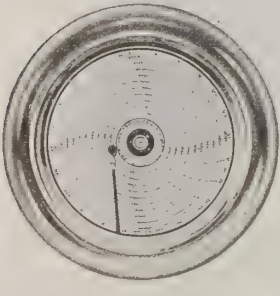
American Gauges

are the simplest in construction, yet so designed that maximum efficiency with longest service is assured to the user. Gauges are too often judged or selected from superficial inspection only, with little or no attention to interior construction—the VITAL PART. In AMERICAN GAUGES only the best material and workmanship will be found, as well as accuracy. This means dollars in every sense of the word to the owner in both operating and maintenance expense. We furnish gauges for every purpose, and especially invite inquiries for installations where operating conditions are unusually severe. Estimates promptly furnished.



American Recording Gauges

The economical operation of power is safely guarded by the use of accurate, durable Recording Gauges. AMERICAN RECORDERS are constructed in the same reliable, workmanlike manner that is characteristic of all our products. The style of case is the same as our non-recording instruments, thus giving uniformity to gauge board installations. Highest grade clock movements are used, insuring accurate time records. Standard chart 8 inch, 24 hours. Special charts to order. Each gauge fitted with our improved fountain pen requiring filling monthly. We specialize in engine room gauge boards complete, and invite inquiry.

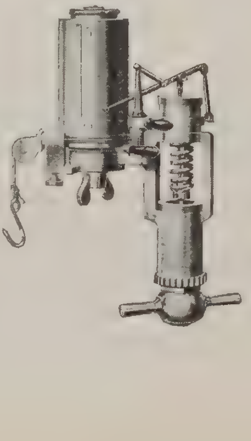


The American Pop Safety Valve

for stationary and marine boilers—fitted with American adjustable-blow-down ring—all adjustments from outside easily accessible. Few working parts. Best material and workmanship. Durable and economical in operation. Made to meet all requirements.

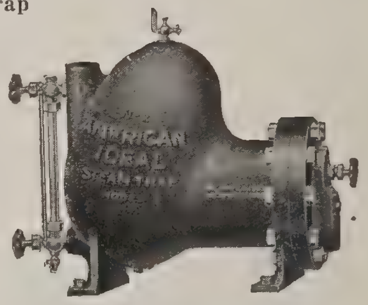
American-Thompson Improved Indicator

The original Thompson Indicator. The highest grade instrument of this kind on the market. New improved Detent Motion makes it possible to take several cards in less time than for one by the old method. Special catalog covering all details on request.



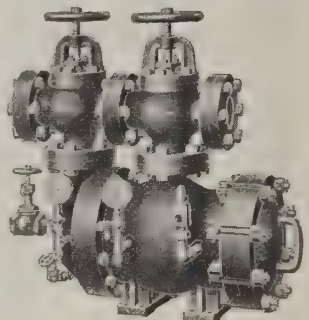
American Ideal Steam Trap

Model C—Regularly furnished for all pressures up to 250 lbs. Has patented valve leverage which permits use of heaviest guaranteed floats, and at the same time has much greater capacities at all pressures. Specify your traps on CAPACITY BASIS only and get FULL VALUE.



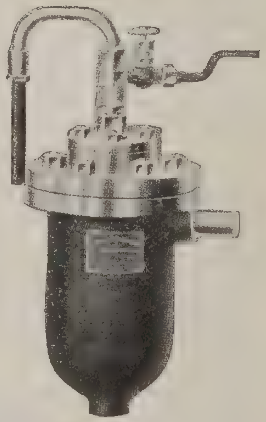
Send for DATA booklet.

The American H2O Grease Extracting Feed Water Filter should be installed in every plant where condensation is used for boiler feed. This practical device makes it impossible for oil to get into the boiler, thus preventing bagging plates, oil caked tubes and danger. It keeps the heating surface clean—increases steaming capacity—and lowers coal bills. Well constructed—has filtering surface equal to many times the area of the feed water pipes—has a device for applying a reverse current of steam for temporary cleaning.



Renewals are easy to make—every part is easy to get at—and the maintenance cost is practically nothing.

The American Thermofeed Regulator:



Maintains water level at fixed height.

Increases boiler efficiency and increases life of boiler.

Reduces expansion and contraction strains of boiler plates.

Reduces strains of rivets and seams.

Protects boiler from danger of "low water."

Send for complete descriptive matter.

Howard Improved Ball Valve

Particularly designed for Blow-Off Valve, but suitable for water, air, oil, gas, beer, etc.

All Bronze—cannot corrode.

Self-wiping and cleaning seat.

Has full area of pipe line.

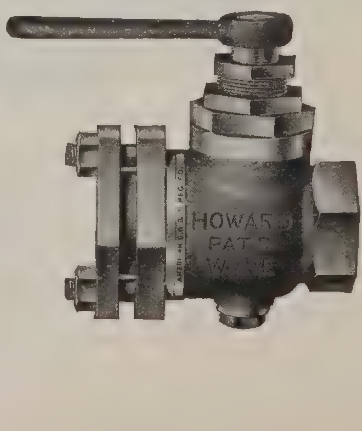
Opened or closed with quarter turn.

The greater the pressure the tighter the valve.

It is adjustable to take up wear.

Tested to 1000 pounds Hydraulic pressure.

Guaranteed for 300 pounds working pressure.



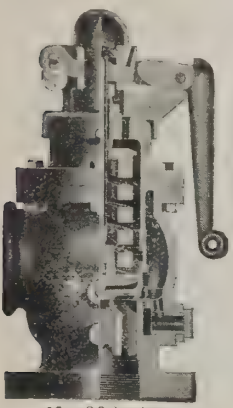
THE ASHTON VALVE COMPANY

271 Franklin Street, BOSTON, MASS.
Works, Cambridge, Mass.
Branches
New York, N. Y., 128 Liberty Street
Chicago, Ill., 174 North Market Street

Safety and Relief Valves, Pressure and Vacuum Gages

Products

Ashton Pop Safety and Relief Valves; Pressure and Vacuum Gages, both regestering and recording; Dead Weight Gage Testers; Engine Room Gage Outfits; Thermometers; Whistles; and kindred Power Plant Specialties.


No. 20 Valve.

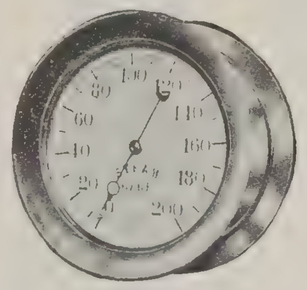
Ashton Pop Safety Valves have been on the market for the past 45 years and have an established reputation for high quality, efficiency and durability. They embody the latest improvements in the state of the art and are made to give dependable service. Their special features of design are as follows: Outside screw Plug Pop Regulator; giving a positive means for adjustment of the blow-back which is always accessible and easily adjustable by means of a wrench. Knife Edge Lip Wing Valve; insuring the most steady and invariable blow back, requiring the minimum amount of adjustment on account of wear and service. Base Outlet Construction; whereby valve can be taken apart for inspection or minor repairs without dis-connecting outlet pipe. Springs: of Jessop's style, carefully made by and tested in our own factory. Compound Trip Lever; making it possible to lift the valve off its seat readily by hand regardless of what may be the boiler pressure. This lever may also be raised to a vertical position and held there, thereby serving as a means for blowing down the boiler pressure. Swivel Top Cap: With its set screw adjustment renders the setting of the lever lifting attachment at any position that may be desired. Testing Clamps: are furnished without extra charge. By their use hydrostatic boiler tests can be conducted without changing the set pressure adjustment of the valve.

Specifications

Valve Styles: The No. 20 single and No. 20-A duplex are the regular standard for use on stationary or marine boilers with saturated steam. These valves are ordinarily made with cast iron body and all working parts of high-grade composition metal, excepting the spring which is of steel and the seat which may be either composition or nickel. For high pressure service steel bodies are furnished. The No. 17 with outside spring, steel body and solid nickel seat and wing valve is especially adapted for use of super-heated steam. All of the above styles are made in sizes from 2″ to 6″ inclusive and are suitable for pressures up to 300 lbs. maximum. For smaller service requirements composition body valves are furnished in sizes from ¾″ to 3″ inclusive. The No. 6 style with top open discharge without lever or lock-up. The No. 8 with lever and lockup and No. 9 with side pipe outlet, lever and lock-up.

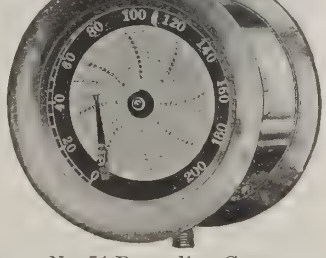
Capacity Schedule

Ashton Pop Safety Valves are regularly made with moderate lift of .10″ which insures smooth operation with greatest durability and lowest cost of maintenance. When so specified, however, they are made to conform to the requirements of A. S. M. E. Boiler Code, or to comply with any state or local regulations.


No. 51 Gage.

Ashton Pressure and Vacuum Gages are conscientiously made of the best material. Solid drawn seamless tubes are used. The movements are non-corrosive, having German silver pinions and arbors. Each dial is accurately and separately made to exactly correspond with the spring and movement of the gage to which it is fitted. The graduations and figures are indented, so that they can be easily read, and will not wear off. The springs are well seasoned to prevent setting.

The No. 51 style pressure gage is commonly used on stationary boilers, is made in all sizes up to 24″ diameter dial, and with either iron, brass or nickel plated case. The No. 52 style, with double spring, is similarly made; but more adapted for locomotive, marine or water pumping service where there is considerable vibration, or rapid fluctuation in pressure.


No. 74 Recording Gage.

Recording pressure gages with 24 hour charts and graduated for any desired pressure are made in two styles, Nos. 73 and 74, and with brass or nickel plated cases. The latter is both registering and recording.

No. 69 Illuminated Dial Gage is so constructed that an incandescent electric light may be placed behind it, and by means of a glass back the light is directed on to the ground glass dial. This is especially valuable in poorly lighted boiler rooms, or for night operation.

Other Appliances

We also manufacture standard styles of water relief and cylinder relief valves, the Ashton Approved Underwriter Fire Pump Relief Valve, Ammonia Relief Valves, Blow-Off Valves, the Ideal Alarm Gage for Sprinkler Systems, dead weight gage testers, engine room gage boards, boiler gage cocks and water gages.

BOYLSTON STEAM SPECIALTY CO.

CHICAGO, ILL,

Manufacturers of

Steam Specialties, Steam Traps, Regulating Valves, Back Pressure Valves,
Tank Valves, Temperature Controllers; Strainer Devices, Etc.

Boylston High Pressure Pilot Reducing Valve

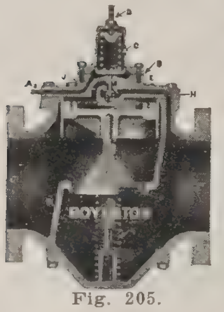


Fig. 205.

This valve belongs in a class by itself, and is an entirely different device from the regular common commercial reducing valve.

It is so sensitive and reliable that delivery pressure can be adjusted from as low as 5 pounds to within nearly the initial pressure, and when adjusted the delivery pressure will remain constant regardless of variations in the initial pressure or volume of discharge

Even with a wide range of operation, no part is of delicate construction nor can the parts be easily deranged.

Can be made of steel and nickel suitable for superheated steam at additional cost.

Boylston Fig. 98 Vacuum and Pressure Regulating Valve.

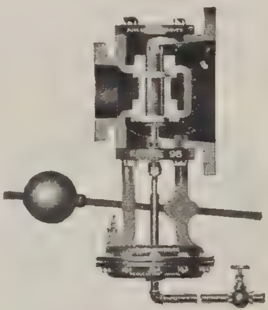


Fig. 98.

The fact that this form of construction of Pressure Regulating Valve is imitated by others, is the best proof of its superiority and merit. Its design and principle are adapted for use on all Vacuum and Vapor Systems of Steam Heating, or wherever it is desired to maintain a constant and uniform pressure on the service side from ten inches of vacuum to ten pounds pressure.

Made in all sizes.

BEWARE OF IMITATION !

The Boylston Steam Trap

Our 29 years of experience in the Steam Trap business have been focalized in the design of a line of Steam Traps, the Boylston, which are as nearly perfect as mechanical skill and an understanding of requirements can make them.

The modern demand calls for a Trap of Capacity, Durability and Positiveness in operation, and one which allows Easy Accessibility to its wearing parts, which points are embodied in the Boylston "Get-at-able" Quick Repairable Improved Steam Trap. Other meritorious features are the Longevity of the Seat and Disc, coupled with the Ease and Cheapness of renewals, without breaking a single pipe-connection—removing the cover, or breaking a Gasket.

In the design of the Boylston Steam Trap, we have eliminated the objectionable features, such as Collapsible Floats, Counterbalance Weights, multiplicity of Levers, superfluous Joints, etc., all of which serve no real or valuable purpose other than to complicate the device. The open-bucket non-collapsible Float is used with a resulting Larger Capacity of the Boylston Trap.

All castings and parts used in Boylston Steam Traps are interchangeable, accurately machined by special tools and templates made for that purpose.

The material we use for the seat and valve disc (the only wearing parts) in the Boylston Steam Trap is made from Boylaney Metal—the hardest known non-corrosive metal in existence.

All other castings are of Charcoal Gun Iron.

Boylston Traps are made is the following classes:

Style A, for pressure ranging from 1 to 30 lbs.

Style B, for pressure ranging from 30 to 125 lbs.

Style C, Extra Heavy, for pressure ranging from 125 to 250 lbs. per sq. in.

Style D, with Unlimited Valve, suitable for pressure from 1 to 125 lbs.

Style E, Extra Heavy Pattern, with Unlimited Valve suitable for pressure from 125 to 250 lbs.

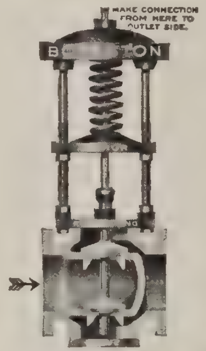


Fig. 204-A.

Fig. 204-A Spring-Loaded High Pressure Type of Regulating Valve

Suitable for reducing steam only from an initial pressure on the high side down to any pressure desired on the service side above ten pounds and less than two-thirds of the initial pressure. The pipe conveying the actuating pressure to the diaphragm must always be connected in such a way as to trap enough water to fill the diaphragm chamber.

This type of valve can be made with the inlet and outlet ends of different sizes.

Boylston Fig. 202 Pressure Regulating Valve

This is the simplest form of construction that is mechanically possible to design and meets a general all-round service. One pressure can be quickly changed to another on the service side of the valve by the adjustment of the weight. Responds instantly to sudden fluctuation.

Where there is a liability of pulsation on the service side, we equip the device with a spring instead of weight and lever.

This type of valve will not reduce below ten pounds on the service side.

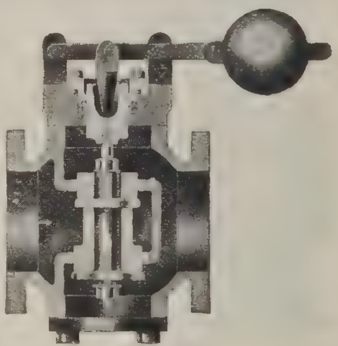


Fig. 202.

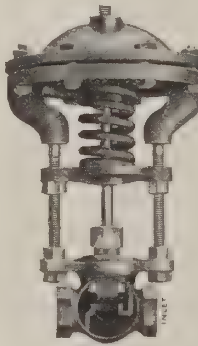


Fig. 88.
Single Seat.

Boylston Junior Fig. 88 Pressure Regulating Valve

Is of the single-seated construction and is particularly adapted for reducing air, water, steam and gas. Has renewable disc that can be easily replaced in a few minutes time at a small expense. Will work upside down equally as well as in the position shown. Can also be placed in vertical pipe if necessary.

Made in all sizes from ⅜" to 2".

Boylston Back Pressure Valve

Being a spring-loaded device, overcomes the chattering and pounding caused by the weight and lever form of construction, and is so designed that a back pressure of only a few ounces or as high as 15 pounds can be carried by a very simple travelling mechanism.

Can be locked wide open in summer time if desired.

Being self-contained, it can be installed in any position.

Made in all sizes from 2" up. Smaller sizes made single-seated.

Has the full area of the pipe.

Is noiseless in operation and tight when closed.

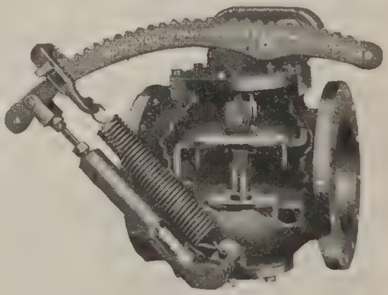


Fig. 234.

THE FAIRBANKS COMPANY

Write Our Nearest Branch

ALBANY, N. Y.
BALTIMORE, MD.
BOSTON, MASS.
BUFFALO, N. Y.
HARTFORD, CONN.
NEWARK, N. J.
NEW ORLEANS, LA.
NEW YORK, N. Y.
PHILADELPHIA, PA.
PITTSBURGH, PA.
PROVIDENCE, R. I.
SYRACUSE, N. Y.

Manufacturers & Dealers

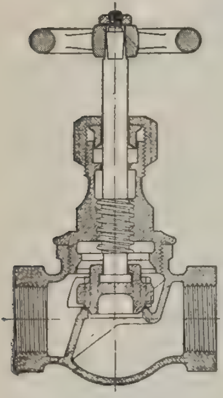
Valves and Cocks of All Kinds, for All Purposes

Products

Scales, Valves, Trucks, and Wheelbarrows, Gasoline Engines, Pumps, Ventilators, Electric Light Plants, Power Transmission Machinery, Power Hammers, Supplies.

Fairbanks Valves and Cocks

Of the many kinds of valves and cocks that we manufacture, the following are the ones most in demand for coal mines:



Fairbanks Brass Globe with Bevel Seat and Disc

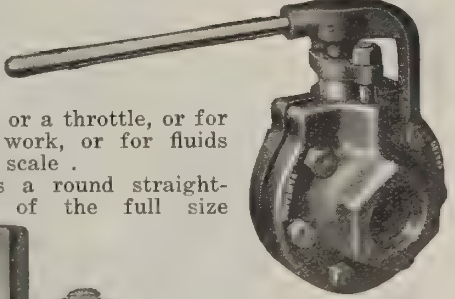
The special feature of this valve is the renewable disc, with bevel seat. The shoulder on the upper side is also beveled, and is so arranged that when the valve is wide open, the disc seats against a corresponding bevel in the bonnet, making a tight joint and taking all pressure off the stem packing. The disc can be replaced by merely slipping it off the end of the stem, and slipping a new one on in its place.

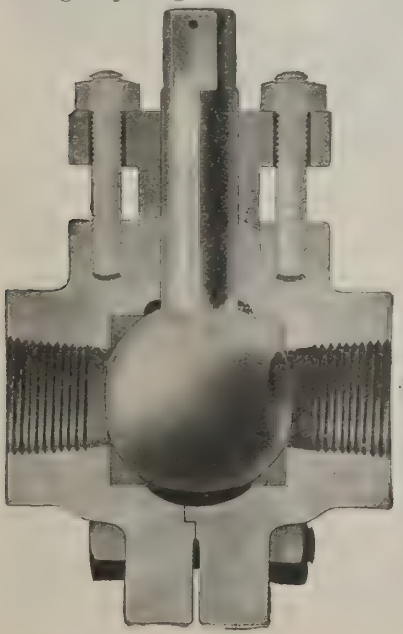
The packing nut is provided with a follower gland. The opening through the valve is the full area of the pipe.

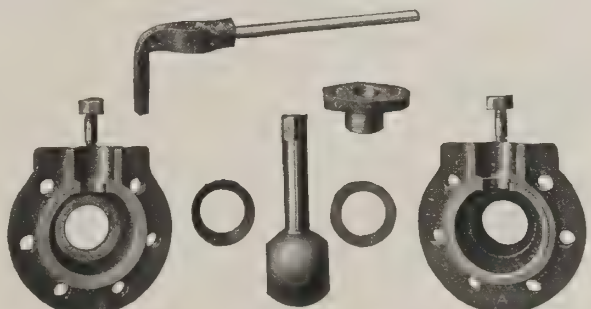
Fairbanks "Sphero" Valve

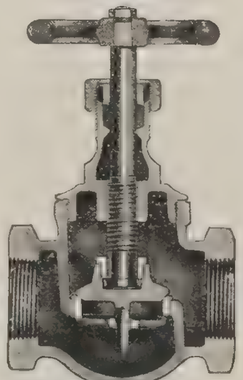
Designed to meet the need of an easily operated, quickly repaired valve or cock that can be used as a blow-off, or a throttle, or for oils or hydraulic work, or for fluids containing grit or scale .

This valve has a round straight-through passage of the full size of the pipe. All parts are interchangeable. The seats are of steel-armored Vulcabeston rings, a hard, tough, durable compound of rubber and long-fibre asbestos. It has just enough elasticity to make a perfect valve seat. These rings are fully protected when the valve is open so the wear on them is very slight, even in the presence of grit or scale. The ball plug bears only against the Vulcabeston, which is elastic enough to compensate for expansion and contraction, and prevents any tendency to bind.







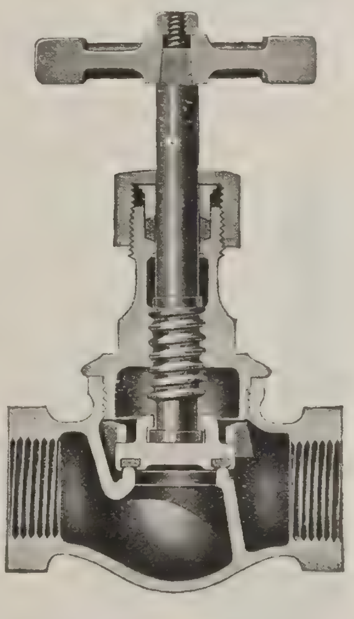


Fairbanks Brass Hub Iron Body Globe Valve

This design is heavier and more compact than many other makes of similar type. The spindle is of large diameter, the packing nut has a follower gland, and the disc seat is heavy. It is especially desirable when quality and durability are the first consideration. May be packed under pressure when wide open.

Brass Globe with Renewable Vulcabeston Ring Disc

To meet special requirements, this style of renewable disc has been designed. The disc is fitted with a ring of Vulcabeston, and when worn can easily be taken out and replaced with a new one. Discs with rings of copper, leather or other material can be used in place of Vulcabeston if desired. Thus, in addition to the ordinary renewable disc features, this type has the advantage of being adaptable to variable conditions by the mere introduction of a new disc.



Fairbanks Renewable Iron Body Gate Valves

The feature of this design is the bronze seat rings, that may be removed by the use of a suitable wrench and replaced without removing the body of the valve from the line.

The body casting is accurately machined, so the new seat rings are strictly interchangeable. A double-taper solid wedge is used, with faces of steam bronze. Pressure may be applied to either side of this valve.

This style can be furnished with either rising or stationary spindle. All parts are interchangeable. The stuffing box may be packed under pressure when the valve is wide open.

The gate by-pass is similar in design and is secured to the body of the valve by a single joint.

FOSTER ENGINEERING COMPANY

Manufacturing Engineers of Automatic Valve Specialties

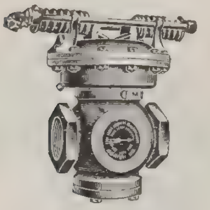
NEWARK, NEW JERSEY

Branch Offices:
CHICAGO PHILADELPHIA BOSTON PITTSBURGH

Products

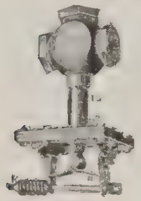
The "Foster" Pressure Regulators; Pump Governors, Non-return Stop Valves; Emergency Stop Valves; Float Valves; Back Pressure Valves; Fan Engine Regulators; Free Exhaust or Atmosphere Relief Valves; Lever Balance Valves; Hydraulic Reducing, Regulating and Relief Valves; Vacuum Regulators, and kindred devices.

Class W Pressure Regulators



Designed to maintain a constant terminal pressure of steam, water, gas or air, under certain conditions, from an available initial or supply pressure in excess of same. Simple in construction, rugged, compact, easily repaired. Ample capacity, no dash pot, noiseless, no small parts to stick. Diaphram actuated with compensating springs externally fitted. Suitable for initial working pressures up to 250 lbs. and for terminal pressures of from 5 to 125 lbs. (dependent on spring power). For service where demand at reduced pressure is fairly constant.

Classes Q. and Q. H. Pressure Regulators



A sensitive, reliable Regulator for heating systems (air or steam). A high-grade low pressure Regulator. No weights or close fitting pistons and is easily adjustable for pressures desired between 0 and 15 lbs. The most reliable steam heating Regulator produced—upkeep reduced to minimum. Made in sizes ¾ inch to 12 inches. Smaller sizes 2 inch and under are fitted with brass bodies; larger sizes have iron bodies, composition mounted and composition renewable seats.

"Q. H."—Same Valve with differential inlet and outlet connections facilitating easy application to enlarged outlet piping connections.

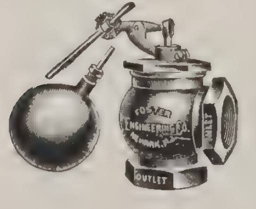
Piston Actuated Pump Governor

Designed for general service and to meet the demand for a Pump Governor that controls the discharge pressure from the pump. Fitted with renewable composition discs, easily and quickly renewed, insuring tight seats. An extremely simple, self-contained Governor—set the adjusting spring for the desired discharge pressure from pump and the Governor will do the rest. Made in angle and straightway body. Sizes one-half to two inches, inclusive, all composition. Two inches and larger, iron body, composition mounted. Will give closer and longer continuous service than any other similar Valve on the market.

Foster Back Pressure Valve

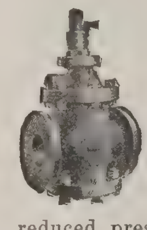
The Foster Back Pressure Valve aims to reduce common difficulties usually experienced with inefficient competitive products, and was designed to meet the demand of modern practice. Does not chatter. Durability, reliability, functioning power at any pre-determined pressure—0 to 15 lbs.—fully assured. The only thoroughly cushioned self-contained Back Pressure Valve on the market. Made in flanged ends, sizes 2½ inches to 20 inches.

Foster Float Valve



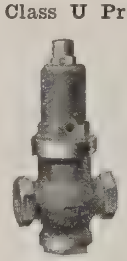
Auxiliary operated (can also furnish "direct acting types"). Quick, sensitive and positively non-leakable; is not cumbersome or frail in construction. Functions with the pressure in supply pipe; may be located at any desirable point, directly or indirectly connected to a small operating Float in the tank. Invaluable on steam line and automatically controlling admission of steam to pump returning water of condensation. May be used in other ways. Angle and globe bodies. Sizes up to two inches, inclusive, all composition. Larger sizes iron body, composition mounted, with removable seats.

Class G Pressure Regulator



A superior high-grade Pressure Regulator that does not leak or stick. Suitable for final working pressure from 0 to 250 lbs. Single seated, auxiliary operated. Holds tight. Suitable for air, steam, oil or water under certain conditions. (We advise them.) Can be installed equally well on horizontal or vertical pipe. Internal parts are easily and quickly renewed. All auxiliary parts interchangeable. Especially recommended for service where demand for reduced pressure is intermittent.

Class U Pressure Regulator

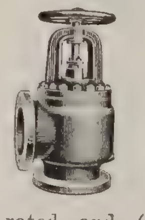


A water pressure regulator that regulates (equally adaptable for air service under certain conditions). Capable of reducing 300 pounds initial pressure to a final of from 5 to 200 pounds. A strong, rugged, reliable product. For service where a steady, even delivery pressure is required whether discharge lines are open or closed. Main valve is fitted with soft disc, easily renewable when necessary. Globe body only. Sizes ½ inch to 2 inches, inclusive, all composition. 2½ inches to 12 inches, iron body, composition mounted.

Class G Pump Governor

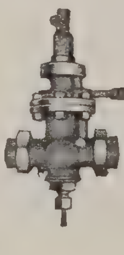
Auxiliary operated, fitted with diaphram on water end, adapted for any service where a steam driven air compressor or Pump Governor can be used and is, without exception, the most satisfactory Valve that has been produced for the regulation and automatic control of pumps. None better. Recommended for hard service where the most severe and exacting duty and close regulation is desired. Guaranteed to operate within a variation of three pounds or less. Holds tight. Made only in globe bodies. Can be installed in any position. Sizes ½ inch to 2 inches, all composition; 2½ inches to 6 inches iron body, composition mounted. For discharge pressure up to 300 lbs.

Automatic Non-Return Stop Valve



Automatically cuts out a defective boiler in the event of blowing out of tubes, poor firing, etc. By their use the admission of steam to a cold boiler from the battery to which it is connected is impossible. A positive factor of safety. The only thoroughly cushioned Non-Return Valve extant. An equalizing Valve. The "Watch Dog" to the boiler equipment. Does not stick, bind, pound or chatter. Fitted with removable seat rings, keyed. For saturated and (especially prepared) superheated steam. Produced in Angle or Globe Bodies. Semi-steel and cast steel. Designed for service rather than to meet competition.

Foster Class G Fan Engine Regulator



Designed to automatically control direct connected fan engine or jet blower system by the boiler pressure. For forced or induced draft equipment. Simple in adjustment. Guaranteed to operate within two pounds variation in pressure. Solely a high-grade device. Sizes one-half inch to two inches, composition, union ends only. Larger sizes iron body, brass mounted, screwed or flanged ends as desired. Strainers furnished. Requires no manual attention after adjustment.

Golden-Anderson Valve Specialty Company

1203 Fulton Building PITTSBURGH, PA.

Manufacturers of

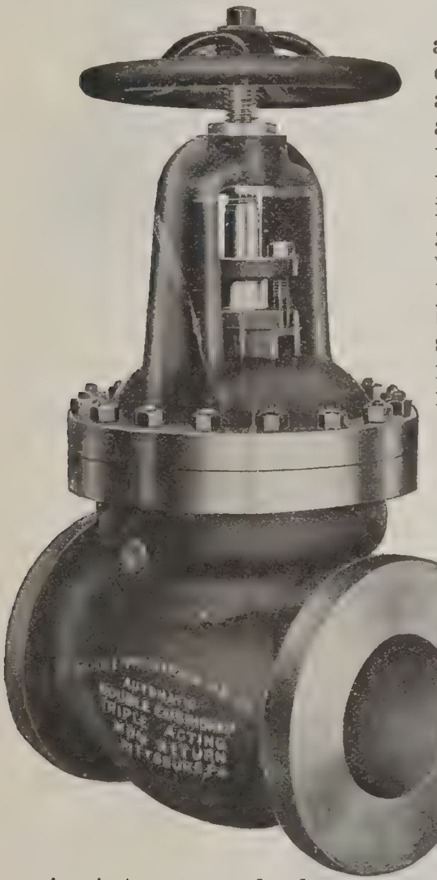
Automatic Steam & Water Service Valves

Triple Acting Valves Work Both Ways, Protecting the Boilers and the Steam Lines.

U. S. Steel Corporation Has Ordered 1,254

"A Good Insurance Policy." "Reduces Insurance Rates."

1. Automatically protect the boilers in case of accident, due to bursted boiler tubes or other rupture.
2. Equalize the pressure between a battery of two or more boilers.
3. Automatically cut in and out the boilers and prevent such accidents of cutting in a boiler too soon due to inacurate steam gauges. Also prevent steam being turned into a cold boiler, which is a safeguard while men are working inside of same.



4. Act as a regular hand-stop valve, as they can be closed by the handwheel, but not opened by same unless desired so arranged.
5. The only Non-Return valves that can be **automatically** tested in service.

The Triple-Acting type, besides containing the above features, also operate in case of accident to the main steam line or branches, cutting off the flow of steam from the boilers, thus insuring protection to the power station throughout.

Make your power plant safe. Keep the boilers working at a uniform pressure and at increased efficiency. Your workmen can be made safe when repairing the inside of a cold boiler—no danger of steam being turned in to scald them to death—by equipping your boilers with Golden-Anderson Automatic Double-Cushioned Triple-Acting or plain Non-Return Valves.

Be Sure of Safety

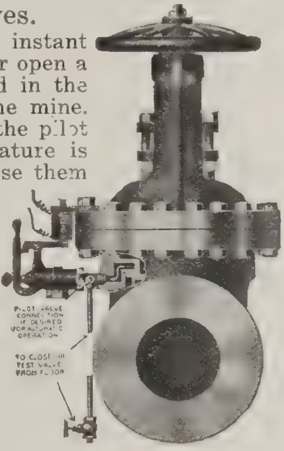
Provide all engines in your plant with Golden-Anderson Safety First Double-Cushioned Quick Closing Emergency Trip Valves.

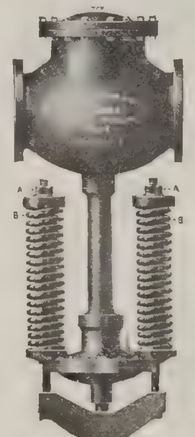
They close automatically, the instant that you press an electric button or open a small valve which may be located in the office, engine room or down in the mine.

They **cannot** open again until the pilot valve is reset by hand. This feature is very important. You can also close them by hand like any stop valve.

Fitted with double Corliss Dashpot which provides a positive cushion in closing, making it **impossible** for the valve to pound itself to pieces.

Hhe H. C. Frick Coke Co., have 150 in service for the protection of their Power Stations.


PILOT VALVE CONNECTION IF DESIRED FOR AUTOMATIC OPERATION
TO CLOSE OR TEST VALVE FROM FLOOR



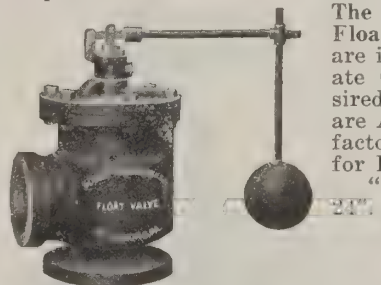
Golden-Anderson Automatic Cushioned Steam Pressure Reducing Valves

XX Extra Heavy "for High or Low Pressure Service."

Embody the elements of simplicity, strength and reliability. Positive in action and always ready for service. Set valve to deliver high steam or other pressure at any reduced pressure and its action thereafter is entirely automatic. Nothing to break, stick or require attention. Perfectly cushioned when opening and closing and operates without noise. Will stand the wear and tear of years without repairs.

The very simple, correct, mechanical construction and operation insures a constant terminal pressure regardless of any fluctuation in the initial pressure.

Valves furnished cast iron, semi steel or cast steel for all pressures.



The Golden-Anderson Float Valves

are instantly adjusted to operate Quickly or Slowly as desired. Indestructible. They are Absolutely the Only Satisfactory Float Valve Known for High or Low Pressure.

"Angle or Globe" ½" to 24".

Patented Automatic Cushioned Controlling Altitude Valves

For Automatically Maintaining Uniform Stage or Water in Tank, Reservoir, or Standpipes. Doing Aaway with the Annoyance of Floats or Fixtures, Inside or Outside. Especially Adapted for Water Works and Railroads.

"For High and Low Pressure." "Works Both Ways." "Most Satisfactory Valves Known."

Sizes to 24".

Homestead Valve Manufacturing Company

Works, Homestead, Pa. :: :: :: P. O. Box 1754, Pittsburgh, Pa.

MANUFACTURERS OF

Homestead "Quarter Turn" Valves, "Hovalco" Angle Blow-Off Valves and Other Specialties

Products

HOMESTEAD SELF-LOCKING STRAIGHTWAY, THREE-WAY, FOUR-WAY, AND ANGLE HIGH PRESSURE BALANCED PLUG VALVES AND HOMESTEAD LOCKING COCKS. FOR STATIONARY, LOCOMOTIVE AND MARINE USE.

Special High Grade Metal Valve for Resisting Mine Water and Other Acids.

The Homestead Valve is "Unlike all Others," especially unlike Globe and Gate Valves because when pressure passes through it the seat is **absolutely protected from wear.** Fully opened or closed by a quarter turn, straight and unobstructed passage, making it particularly suitable for the handling of heavy liquids or for carrying off sediment.

Dsecription

Fig. 1 is a sectional view. The valve is so constructed that when it is closed the plug is at the same time forced firmly to its seat. The traveling cam "A" is prevented from turning with the stem by means of the lugs "B," which move vertically in slots. When valve is open the cam will be in the lower part of the chamber in which it is placed and the plug will be free to be easily moved. A quarter of a turn causes the cam to rise to the upper surface of the chamber, while a slight motion in the other direction releases the cam and the qlug turns easily to its proper open position. "E" and "D" are balancing ports which allow the pressure to predominate at the top of the plug holding it gently in its seat while valve is open. Made in all sizes up to 6 inches and for all pressures up to 5,000 pounds per square inch: in Straightway, Three and Four-way patterns.

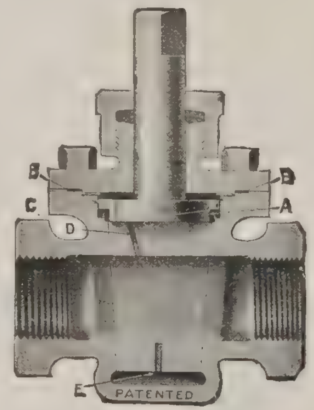


Fig. 1—Sectional View Homestead Straight-way Valve.

Homestead Acid Resisting Valve

The valve shown in Fig. 4 was designed to supply the demand for a valve which would withstand the effects of sulphuric and other acids. It is also used for many other kinds of service. It outwears several valves made of ordinary steam metal. The brass used is a high grade special metal especially suitable for the purpose. It will withstand a higher pressure and more exacting service than the ordinary kind of valve. The mechanical principles are the same as in the Homestead Straightway Valve. Also made of Monel Metal for special service.

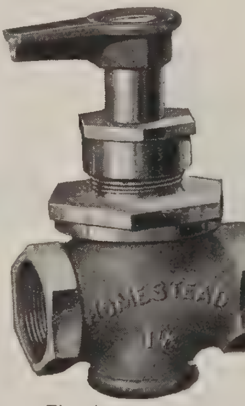


Fig. 4—Homestead Acid Resisting Straightway Valve

The Homestead Valve is best known as a Boiler Blow-off Valve. It is extensively used for this service on stationary, marine and locomotive boilers.

Homestead Three-Way and Four-Way Valves

The Homestead Three-Way and Four-Way Valves are used principally in operating hydraulic or pneumatic machinery in factories, mills, mines and on railroads. They are made according to the same principle as the Homestead Straightway Valve and are superior to the ordinary Three-Way and Four-Way Cocks in every way.

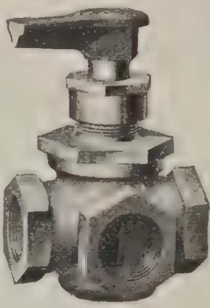
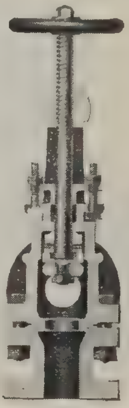
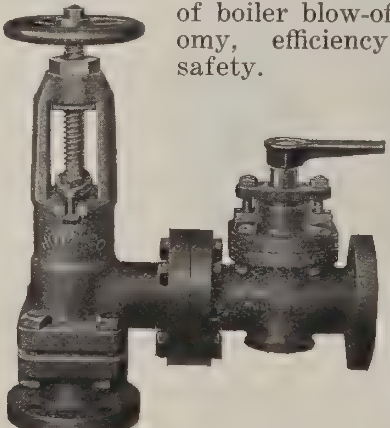


Fig. 9—Homestead Three-way Valve; Brass, 200 Lbs. Working Pressure.

The Hovalco Angle Blow-Off Valve is the last word in Angle Boiler Blow-Off design. The **Hovalco** is based upon experience gained through twenty-five years of valve making, and is a result of years of careful investigation and close analysis of all details which enter into the make-up of boiler blow-off economy, efficiency and safety.





The **Hovalco** is shown here bolted to the famous Homestead Quarter Turn Blow-off Valve. The combination is in accordance with the recommendation of the Committee on Uniform Boiler Laws of the A. S. M. E. In some States such a Combination is compulsory by law.

The **Hovalco** Angle Blow-off Valve is guaranteed for a period of two years.

Catalogue

Our catalogue fully meets the requirements of the trade. It will be of great service to you when ordering valves or seeking information regarding their construction. We will be pleased to send you a copy upon request.

JENKINS BROS.

80 White Street
NEW YORK

524 Atlantic Avenue
BOSTON

133 No. 7th Street
PHILADELPHIA

300 West Lake Street
CHICAGO

Jenkins Bros., Limited, Montreal and London. Jenkins Rubber Co., Elizabeth, N. J.

Products.

Jenkins Bros. Valves, in Brass, Iron Body, and Cast Steel for all pressures and purposes; Mechanical Rubber Goods, Sheet Packing, Gaskets, Gasket Tubing, Pump Valves, Valve Discs, Union Rings, and the like.

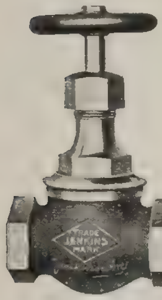


Fig. 106
Globe, Screwed.

Jenkins Bros. Valves, Standard Pattern, are made in brass and iron body in Globe, Angle, Cross, Check, Y, Radiator, and other patterns, screwed or flanged. They are the original Renewable Disc Valves. The Jenkins Bros. Discs, with which they are fitted, are of special rubber composition, readily adapting themselves to the raised seats, ensuring absolutely tight closure. As there is no metal-against-metal contact of seats, there is less abraision and wear and the labor of regrinding is obviated. Jenkins Bros. Discs are inexpensive, give long service, and when worn out can be readily renewed without removal of valve from piping. All Standard Pattern globe and angle valves when intended for steam service are fitted with Jenkins No. 119 Discs, a new composition, tough and flexible in service, guaranteed for 150 pounds working pressure; for cold water, gas and air service, valves are fitted with Jenkins Soft Flexible Rubber Discs.

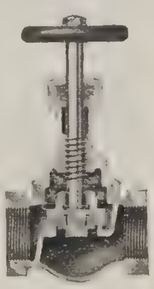


Fig. 105
Sectional Cut
Globe Valve

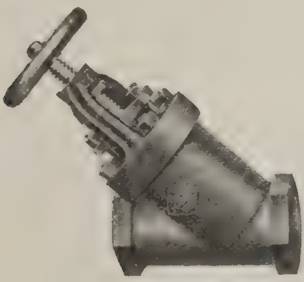


Fig. 296
Iron Body Y,
Screwed.

Jenkins Bros. Valves,
Extra Heavy Pattern.

A distinct line of brass and iron body Globe, Angle, Cross, Check and Y Valves, especially designed for use under high pressure and very severe conditions. No effort has been spared to make them representative valves of their class, in line with Jenkins Bros. established policy of making valves of superior grade, absolutely guaranteed for the service for which they are recommended.

For high pressure, superheated steam, and hydraulic pressures valves are made with cast steel bodies, monel metal mountings, guaranteed for working steam pressures up to 350 pounds, and total temperature of 800 degrees F.

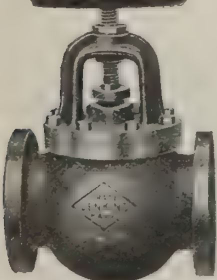


Fig 142
Iron Body Globe,
with Yoke,
Flanged.

Particular attention is called to the Jenkins Bros. Automatic Equalizing Stop and Check Valves, designed to equalize the pressure in a battery of boilers, preventing one boiler from working at a lower pressure than another. They automatically shut off the flow of steam from the header to a boiler in case of a broken tube, thus preventing accidents. No boiler plant operating two or more boilers should be without one or more of these valves.

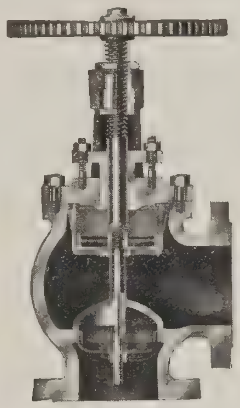


Fig. 293
Automatic Equalizing
Stop and Check Valve.

Gate Valves.

Jenkins Bros. Gate Valves are made in brass and iron body in three patterns: Standard, for 125 pounds working steam pressure, or 175 pounds water; Medium, for 175 pounds steam or 250 pounds water; Extra Heavy, for 250 pounds steam or 400 pounds water.

They are of the solid wedge, double-face type and have improved globe-shaped bodies, a design which secures the greatest possible strength, good proportion, and neat appearance. They are made with Inside Screw, Stationary Spindle or with Outside Screw and Yoke, Traveling Spindle.

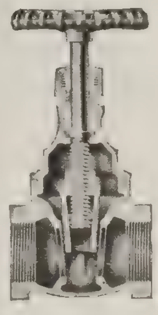


Fig. 270
Sectional Cut
of M. P. Brass
Gate.

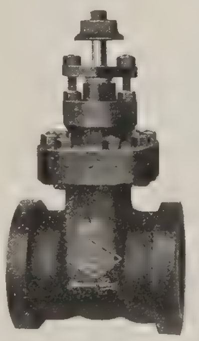


Fig. 327
Hub End Gate

Mechanical Rubber Goods.

In this line we are offering specialties which are the result of over 50 years of progressive effort, as we are the original manufacturers of rubber composition discs for valves and unvulcanized sheet packing.

Jenkins '96 is the name of our high grade black unvulcanized sheet rubber packing, furnished in sheets or gaskets. **Jenarco** is a new sheet packing, very tough and flexible, and suitable for severe service.

Jenkins Bros. Pump Valves are made from various compounds, each of which is best adapted for a certain kind of work. We make valves which have adequate strength and tenacity for the severest kinds of mining service. We would be glad to hear from mines having trouble with the pump valves they are using, as we are confident of meeting their requirements. State your working conditions, giving diameter, thickness and size of hole, **and we will be responsible for the service.**

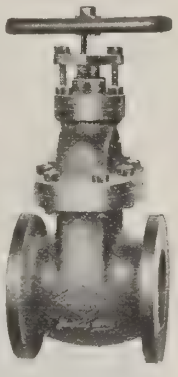
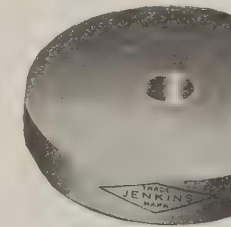


Fig. 326
Iron Body Gate
Inside Screw
Flanged.


Pump Valve

Quality and Guarantee.

All genuine Jenkins Bros. products are absolutely guaranteed to be perfect in workmanship and suitable and efficient in the service for which they are recommended.

Jenkins Bros. catalogue No. 20, giving sizes, styles and list prices, mailed on request.

W. H. NICHOLSON & COMPANY

WILKES-BARRE, PA.

Representation in Most Cities.

Wyoming Automatic Eliminators, Wyoming Steam Traps Wyoming Separators

Products

Wyoming Automatic Eliminators (combined steam separators and traps); Wyoming Steam Separators; Wyoming Steam Traps (weight or piston operated).

Nicholson Expanding Lathe Mandrels; Nicholson Locomotive Eccentric Expanding Mandrels; Nicholson Compression Shaft Coupling; Nicholson Boiler Tube Expander.

General Machine Jobbing and Contract Work.

Wyoming Automatic Eliminator

For the last eleven years this **combined separator and trap** has been one of the most widely used devices for safeguarding steam engines and pumps in the anthracite and other American coal mining regions.

The long steam lines so frequent in the mining regions naturally produce tremendous volumes of condensate, which must be eliminated to assure dry steam in prime mover cylinders. In addition to condensate, the slugs of water which often traverse these lines make steam drying very difficult—practically impossible, in fact—for any apparatus not especially designed for the service.

Wyoming Automatic Eliminators of either type are unqualifiedly guaranteed to keep steam lines 99.5% dry.

Vertical Type

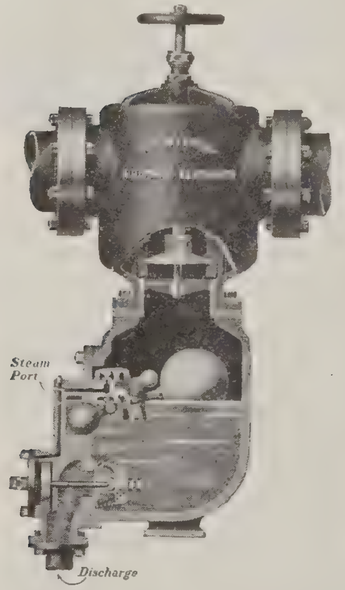
The verticle type, shown in the next column, is used successfully between throttle valve and the steam chest. It can be placed as close to the steam chest as desired, and assures dry steam in the cylinder.

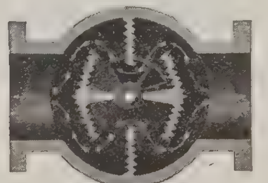
It is used for outside service extensively, but not to the same degree as the

Horizontal Type

The two cross sections below shown clearly the differences of these two types. Both are guaranteed to remove the same amount of water or moisture from steam—99.5%.

The trap-section is unique in that it has greater **discharge** capacity than traps of any other make, rated at the same **trap** capacity. In one size, alone, for example, the discharge area in the traps of these eliminators is **sixteen** times that of other devices.





In this—the horizontal type—six vertically corrugated baffles assure complete separation. The trap below drains instantly without wiredrawing.

Wyoming Separator

Practically the same as the separator section of the eliminator. It is designed for the same purpose, and differs only in the substitution of a drain tank for the steam trap. It can be used in combination with a trap, if desired.

Like the eliminators, it is also guaranteed to arrest 99.5% of the moisture in steam lines.

It is drained manually, instead of automatically, and fitted with a water glass for measuring the level in the tank.

Wyoming Steam Trap

It is made in two general types—weight-operated or piston operated. In both designs wiredrawing through the discharge valve is impossible, since movement is so fast that the seat is closed or opened instantly. In the weight-operated type the weight controls opening, and the float controls closing. The piston type is steam controlled. When the float reaches its highest point it opens a needle valve which admits steam to the piston. The valve opens instantly. When the water level recedes enough the falling float shuts off the steam supply and the pressure drives the valve back at once.

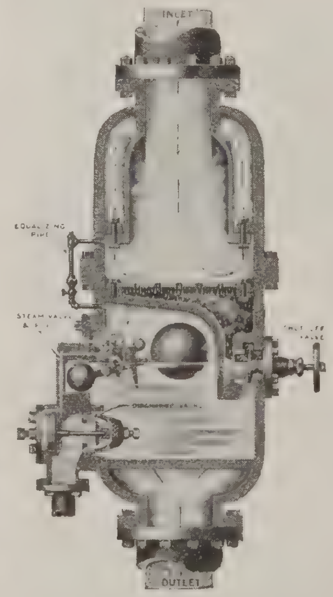
Other Products

The popularity of the other Nicholson and Wyoming products listed in the first paragraph is attested by their extensive use.

Descriptive matter covering all products will be sent immediately on request.

We will be glad to ship any of our devices to users for a thorough 30-day test.

The engineering department is always anxious to consult with possible users of any of these products. If you are trying to find a better way of doing things on a lathe, milling machine or grinder, in power or steam transmission, let our engineers assist you.



In the vertical type a perforated baffle plate catches all water. The trap section below is piston or weight-operated. These devices are **separator-traps.**

THE UNIVERSAL LUBRICATOR CO.

136 CHESTNUT STREET, PHILADELPHIA, PA..

The Scranton Supply & Machinery Co., Scranton, Pa.
Frick & Lindsay Co., Pittsburgh, Pa.
Hazleton Machinery & Supply Co., Hazleton, Pa.

The "Phiadelphia" Compressed Air Grease Cup

Perfect Lubrication—Use 50% Less Grease.

The "PHILADELPHIA" Compressed Air Grease Cup satisfies the engineer because it saves him time, attention and labor, removes all worry about the condition of his journals, and enables a better showing of his expense account.

It pleases the grease consumer, the man who has to pay the bills, because of the large economy effected, both in first cost as compared with spring or force-feed cups, and in cost of operation.

It is the only cup the grease manufacturer consistently recommends, being the only device which positively insures his product reaching the journal in its natural state so as to accomplish its full work effectively, economically and with entire satisfaction to all concerned.

There being no weight to the motive power, the feed is not effected by centrifugal force when used on loose pulleys or the like.

Feeds equally well from any angle or position, or on high or low speed machinery. No amount of shaking or vibration interferes with the feed.

Being absolutely dust-proof is the best grease cup for **mine machinery.**

The best proof of the superiority of the **"PHILADELPHIA" Compressed Air Grease Cup** over any other system, will be to send for a sample and give the cup a trial—the more severe the test, the more convincing will be the proof. Once convinced that this is the best device for safe, efficient and economical lubrication, your own self-interest will make you our friend and customer.

This cup is made from pressed steel, which is much stronger than any casting, though of less weight, thus greatly diminishing the chances of breaking off the shanks.

In ordering always give size of cup and pipe thread shank desired, also state whether "polished" or "plain."

How It Acts

This can be stated in a few words:

"It applies an old natural law in a modern 20th century fashion."

The result is, perfect lubrication.

The natural law referred to is simply this:—

You will note the cup is made in two sections, the lower half threaded half way down on the inside, the upper half threaded its full length on the outside and made to fit into the lower half.

The upper half also contains flat disc which swings loosely from the center.

Now, the lower half being filled level full with grease, this disc is laid gently on the surface and the upper half screwed in seven turns.

It will be seen that a quantity of air is entrapped in the upper half of the cup, and by screwing the upper half into the lower you have compressed the air into a smaller space than it originally occupied.

Under these conditions this air is bound to expand, thus—

What It Accomplishes

By compressing the air in the upper half of the cup it is bound to expand along the line of least resistance.

The line of least resistance is toward the journal, there is not sufficient pressure to **force** the grease into the bearing, but enough to keep it supplied in exactly the proper quantity at all times.

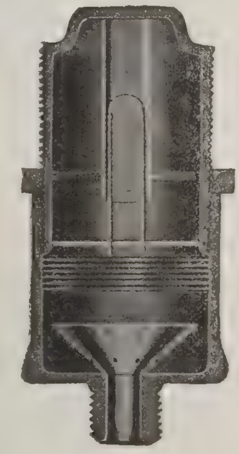
Only as the journal needs more grease, will more feed; naturally when the machinery stops the cup stops feeding.

When the machinery starts, the cup is instantly ready to start also.

Isn't this the case with spring cups and automatic cups (so-called) also?—you ask. No! it isn't, for this reason:

Why It Excels

The difference between the **"PHILADELPHIA" Compressed Air Grease Cup** and other grease cups is simply this:



Spring cups and so-called automatic cups which exert a pressure on the grease, so change its consistency by squeezing out the lighter material first that it becomes harder and harder to feed, until, when almost empty, the remaining portion has often to be scraped out and thrown away.

Result—waste.

First, the journal gets too much lubrication by a consistency of grease not fitted for its use, and later not enough lubrication because the consistency is too hard to meet the requirements.

On the other hand—

"PHILADELPHIA" Compressed Air Grease Cups never change the consistency of the grease; never feeds more than is necessary, nor less; never wastes a particle, for the last drop is the same as the first; and lastly—

It solves the problem of grease lubrication.

Capacity of Cup.........	½ oz.	1 oz.	3 oz.	6 oz.
Diameter across base...,	1¼"	1¾"	2¼"	2¾"
Height emptied..........	1¾"	2⅛"	2⅞"	3¼"
Height filled............	2¾"	3½"	4¾"	5½"
Shank—pipe thread......	⅛" & ¼"	¼" & ⅜"	⅜" & ½"	½" & ¾"

Send for booklets, prist-list and discount.

CANCOS MANUFACTURING CO.

Garden and Bridge Sts. PHILADELPHIA, PA

Manufacturers of

Products

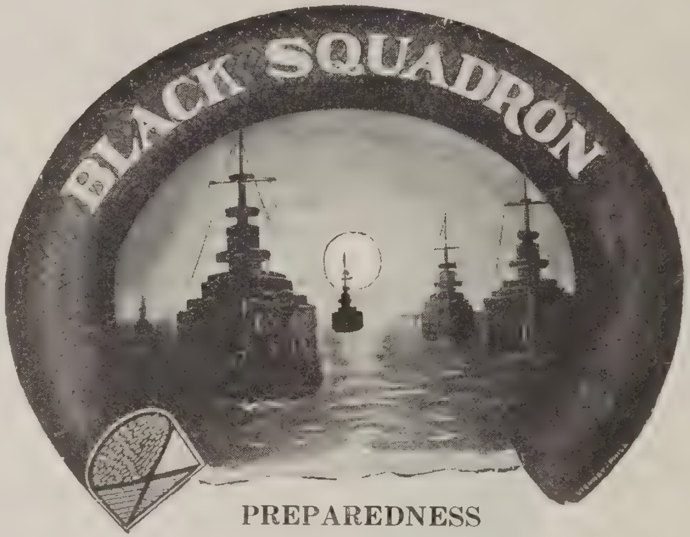
We manufacture a complete line of Packing; Pump Valves; Hydraulic Rings; Asbestos and Rubber Gaskets; Metal Polish; Water and Steam Hose, Etc.

The most efficient packing in use today in the coal mining districts.

Why?

Long service which does not necessitate frequent shut-downs.

Thorough Lubrication which means repair bills reduced to a minimum.



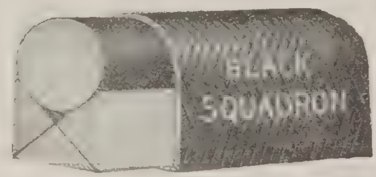
PREPAREDNESS

Nominal cost, thereby reducing your yearly upkeep for packing.

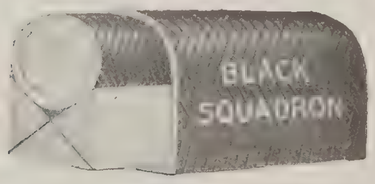
Backed by 25 years of packing manufacturing experience.

The accompaning cuts will give you an idea of the construction of our packing.

Made for every purpose, air, gas, chemicals, ammonia and steam.



High Pressure Up to 150 Lbs.



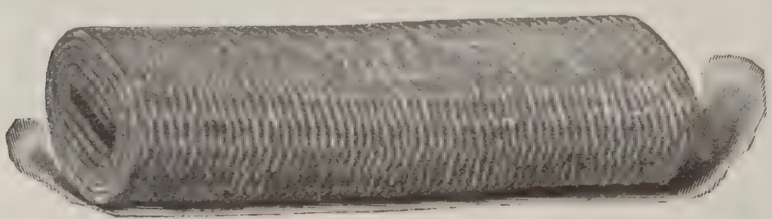
Low Pressure Up to 100 Lbs.

Observe the sliding wedge principle, embodying the universal chuck idea.

In your own mine prove that it is the best packing you have ever had.

White Squadron

Suitable for slush pumps. Guaranteed to give perfect satisfaction until absolutely worn out in the stuffing box.



White Squadron.

Samples sent upon request. Send for our illustrated catalog.

The Packing That Works on a Principle

It has long been recognized by steam users and manufacturers alike that the sliding wedge form of packing is vastly superior in every way to the old style solid packing, and for this reason every new packing that has appeared recently embodies the "sliding wedge" in one form or another. "Anything so it's a sliding wedge" seems to be the basis on which most of them are made. Here is where Black Squadron Packing differs from all the others. It is not a new packing, by the way; it is one of the old standards in which the sliding wedge principle originated. Nor is the combination of sliding wedges here shown the result of a happy thought, for it took many months of testing and experimenting to get the correct combination that would embody all the best theoretical principles in the practical working combination.

But we got it, and are ready to prove it to the largest users of packing that "Black Squadron" is the longest wearing, best lubricating, air or ammonia packing on the market.

Regarding the Principle

Do you know anything about chucks? If you do, you do not need to have it pointed out to you that Black Squadron embodies the principle of the universal chuck perfectly. If you do not, it will pay you to look into it, then you will better understand why Black Squadron works where other packings fail.

About Materials

It is not necessary for us to go into all the details of why packings charr, burn and blow out, or why they vulcanize and score the rods. Besides, the reasons are not always the same, so all we wish to say on the subject is that Black Squadron packing keeps its pliability all the time, that it wears the same all through.

And the Reason

Is that each grade is made of material especially adapted to the work it is going to perform. Each of the three wedges in Black Squadron is composed of cotton duck and rubber. These are thoroughly saturated and covered with a special lubricating compound. These wedges are capped with a cushion that absorbs all oil and keeps the rod lubricated, causing it to slide backward and forward with the least possible friction, thus prolonging the life of the packing indefinitely. All are encased in a network to keep them in place. This network is made of a specially tough material, because it receives the brunt of the wear on account of its being next to the rod.

Black Squadron Packing

Is made in quite a variety of styles that it may be adapted to all pressures, and every purpose. Furthermore, it is the invention of an engineer of long experience, a man who had helped his "dad" pack the engine on Sundays and holidays, and who understood the needs of his brother engineer to begin with.

DURABLA MANUFACTURING CO.

General Offices:
114-118 Liberty St., N. Y C
Branch Offices:
HARTJE OFFICE BLDG., PITTSBURGH
27 NO. 7TH ST., PHILADELPHIA
FISHER BLDG., CHICAGO

Asbestos Sheet Packing, Gauge Glasses, Valve Discs, Etc.

DURABLA Asbestos Sheet

The DURABLA Sheet, made from Asbestos Rock Fibre and the best Rubber Bond, is sold on Service Basis and guaranteed to make Tight Joints on All Pipe Flanges and All Flanges on Pumps or Machinery.

The DURABLA Sheet is a Quality Sheet and will not harden or crack in stock or service.

It is equally efficient on high and low pressures, water, oil and gasoline engines.

Sheets measure 48″ x 60″ and 36″ x 120″.

Look for the Durabla Trade Mark on every gasket and sheet. It is the guarantee of the genuine Durabla.

The DURABLA gaskets, cut from the DURABLA Sheet, are carried in stock in all Sizes, all Shapes and Thicknesses.

All orders are promptly filled.

Durabla Metallic Gauge Glasses

The DURABLA metallic gauge glasses have no equal for efficiency and safety. The DURABLA glasses are used and recommended by railroad companies and power houses where these qualities are demanded.

All sizes have fused ends.

"Durabla" Etched on Every Glass.

Durabla Lubricator Glasses

The DURABLA Lubricator Glasses are made from the same quality of glass as the gauge glasses and have no equal, being practically unbreakable.

Glasses for klinger gauges always in stock as well as bulls eye glasses for all makes of lubricators.

Durabla Valve Discs

The DURABLA Valve Discs are of exceptional quality. They will stand high temperatures and will not harden or crack. The DURABLA Valve Discs will save extra labor and expense and add life to your valves.

"Durabla" Stamped on Every Disc.

THE B. F. GOODRICH COMPANY

Factories: Akron, Ohio

Representatives in All Districts.

Packing, Valves, Gaskets, Water Hose, Steam Hose, Air Hose, Couplings, Transmission Belting

---

Packing

"SUPERHEAT"—None better for extreme pressure and superheated steam lines. Tested to 1200 degrees and 900 pounds steam pressure. Tensile strength of over 3000 pounds. No ply separation—joints break clean. Smooth surface makes absolutely tight joint. Withstands superheated steam, refrigerating solutions, ammonia, acid, air or gas. Makes joints permanently tight. Will not squeeze or blow out. Vibration does not affect it. Thinner sheet gives more joints per pound. In any practical thickness, plain or graphite on one or both sides.

RED SHEET—A good dependable packing. Made plain or with brass wire insertion. Get a sample of "AKRON" Brand.

Square Duck—Highest quality—fine or coarse duck.

Spiral Duck—Round or square—high or low pressure.

Valves

Goodrich Rubber Valves for hot water, cold water, air pumps, etc., are giving entire satisfaction in mining service. They are built for service. Listed below are seven Standard Goodrich Grades:

No. 25—Soft valve, for cold water, pressures up to 100 lbs.

No. 20—Slightly stiffer than Grade No. 25, suitable for cold water pressures up to 150 lbs.

No. 85—Semi-hard, for cold water pressures up to 200 lbs.

No. 60—Semi-hard, for cold water pressures up to 350 lbs.

No. 200—Standard hard valve, for all classes of hot water service.

No. 305—Soft valve for the best quality, strong, tough rubber for air pumps and jet condenser service and low pressure curved guard work.

No. 120—Standard valve for curved guard service.

Gaskets

We have a rubber gasket of whatever shape and for whatever purpose desired.

Diaphragms

Pump Diaphragms, well constructed from good materials, come in eight sizes, The severe service in these pumps makes the purchase of the best diaphragms obtainable—an economical investment always.

Water Hose

Goodrich Water Hose is long lasting, despite the hardest usage. For dependable service we recommend "Commander," extra heavy cover; "Akron," smooth cover; and "Monitor," smooth cover.

Steam Hose

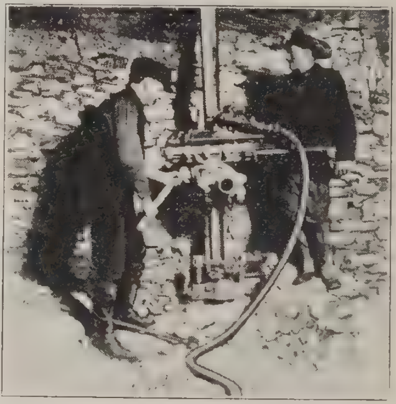
"Superheat"—a distinctively special hose for extreme service at very high pressures and high temperatures. The quality of the tube and the friction between the plies are the best. "Superheat" is the unusual in steam hose, built for unusual service.

"Goodrich"—has tube of proper thickness and quality to resist heat, oil and pressure and yet retains its "life" to render maximum service. For high pressure work.

"Falcon" — a very substantial hose for light requirements.

Air Hose

Air hose of Goodrich manufacture is designed to cope with rough usage. External abuse from abrasion and falling rocks, unusual wear set up by pulsation, the jarring of blasts, the soaking of hot oil, high intermittent pressures, and other common afflictions of mining practice are guarded against in the most effective, successful manner possible.


Air Hose in Mining Service.

Braided Fabric Type

"COMMANDER"—for roughest service. Has extreme flexibility and special oil resisting tube. Cover several times thicker than the average hose. No wire winding or other armor necessary. Recovers immediately from force of blows. No rusting, breaking or distortion.

"Mainstay"—For high pressure lines, as in metal mines and for general usage. Extreme quality. Cover not as heavy as on "Commander."

"Safety"—Good grade, substantial and thoroughly reliable.

Wrapped Duck Type

"Quarry"—Strong, sturdy construction, with ply of canvas over outer rubber cover. Protective coverings if desired.

"Falcon"—A cheaper priced hose which will withstand pressure, but not as long as "Quarry."

Couplings

Water, Steam and Air Hose Couplings. Extra shank for high pressure hose.

Transmission Belting

"Commander"—Maximum gripping power—great tensile strength—extreme flexibility—moisture-proof—absorbs shock and strains—runs absolutely true—friction surface, gum cushion type.

"Pinnacle"—Friction surface type, high grade friction. Unusual tensile strength.

THE JOHNS-PRATT COMPANY

HARTFORD, CONN.

VULCABESTON
Red Fibre Sheet Packing

Realizing that existing conditions demand a flange joint packing that has greatest adaptability we have after years of experimenting, succeeded in producing a packing that is designed to meet the exacting requirements of present day conditions.

Vulcabeston Red Fibre Sheet Packing

Is made from selected long fibred asbestos of the highest quality, treated with a scientific composition that makes the fibres impervious to moisture, and pressed under enormous pressure to give it great density. It can therefore be used under conditions of **wet steam, condensation, hot water** and for other liquids. It is also adapted for **superheated** or **saturated** steam, oils, ammonia, hot air, acids or alkaline solutions. Unlike many asbestos packings on the market it **does not pulp,** rot or become soft in the joint, also will not clog the pipes like rubber or other packings.

VULCABESTON Red Fibre sheet packing is the highest quality sheet packing made. It cannot blow, burn or squeeze out under the highest pressure, nor is it affected by the most extreme temperature, and a joint made from same can be broken as often as is desired without affecting the gasket.

VULCABESTON Red Fibre sheet packing can be absolutely guaranteed to give satisfactory results on air, ammonia or gas compressors.

VULCABESTON Red Fibre sheet packing can be used under a steam pressure of 400 lbs., air pressure of 1300 lbs., and will withstand the highest temperature.

VULCABESTON Red Fibre sheet packing does not **burn or stick** to the flanges like other packings. Therefore, a joint can be easily broken, saving much time and labor.

VULCABESTON Red Fibre sheet packing is the only fibre packing made that will carry in stock without **drying out** and **becoming hard** and brittle.

VULCABESTON Red Fibre sheet packing will not get soft, crawl or squeeze out when being applied.

VULCABESTON Red Fibre sheet packing is made in sheets 40″ x 40″ and in thicknesses 1-32″, 1-16″, 3-32″ and 1-8″, at a list price of $2.00 per pound. Discount on application.

New Jersey Car Spring & Rubber Co.

JERSEY CITY, N. J.

BRANCH OFFICES:

NEW YORK, Hudson Terminal Bldg.
PITTSBURGH, PA., Jenkins Arcade.
CHICAGO, 55 West Lake St.
PHILADELPHIA, 324 Lafayette Bldg.
CLEVELAND, 1368 Third St., N. W.
LOS ANGELES, 1315 So. Figueroa St.

QUICK SERVICE IN ALL DISTRICTS.

Manufacturers of

Mechanical Rubber Goods

Packing, Belts, Gaskets, Valves All Purposes, Air Drill Hose, Suction Hose, Water Hose Fire and Mill Hose, and Moulded Rubber Goods

Products

Rubber Belting, Valves, Packings, Gaskets, Hose, Mats, Matting, Springs, Tubing and Automobile Tires.

Belting, Various Grades, All Purposes

The "Arcadia" is a friction surface belt, particularly valuable where there are heavy and severe demands for power.

We make also the "Extra Para" belt, made from the best grade of rubber and special heavy cotton duck; the "Gladiator" Seamless Quilt Stitched Belt, used chiefly in paper and saw mills; "Gladiator" Seamless Straight Stitched Belt; also the "Eagle," "Reliable," "Staple" and "Wayne" brands of belting.

"Arcadia" Belt.

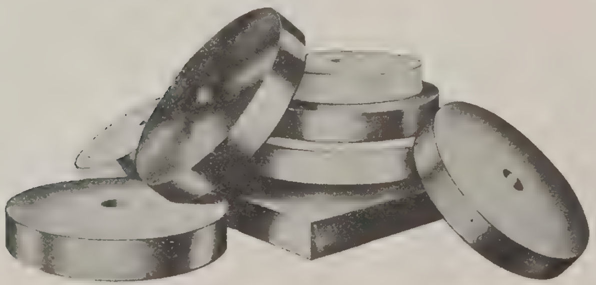
Conveyor Belting

We make highest grade Conveyor and Elevator Belts with flanged edges, suitable for all kinds of material, such as coal, stone, ore, gravel, sand or wood pulp.

Gaskets, All Kinds.

Gaskets

Gaskets and rings of any size or pattern made to order. We manufacture plain or cloth insertion, mixed or pure styles, also tubular gaskets.



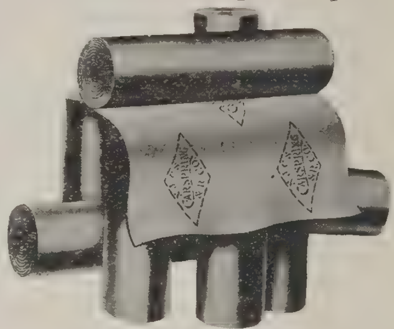
Valves for All Purposes.

Valves

Valves for all purposes, such as water works, sulphur water acids, ammonia, oils, volatile liquids and marine work, we are prepared to furnish, as we have made a special study of the requirements in valves for all these uses, and our goods are satisfactory.

Packings

Our packings are made for all purposes and to meet any demand that can arise in power plant usage. Piston and plunger packings made of rubber, hemp, cloth and duck in various combinations and in round, square or special forms are among our products.



Gibraltar Packing.

Special Brands

Among our special brands of packing are the "Red Oak," for steam, oils or ammonia; and "Gibraltar," black sheet packings, guaranteed to be unaffected by superheated steam, and that will neither burn nor blow out under high pressure. Also "Plumbago," unvulcanized sheet packing, any thickness or length required; "Indigo" brand and Wire Insertion packing.

Hose

Rubber Hose made with seamless tubes, by a patented process, is another important product of our works. We can furnish it for water, either high pressure or ordinary use. Also steam and air hose, of which we make several standard brands.

We make suction hose, from the smallest to the largest sizes, either rough or smooth bore. According to specifications, it will be furnished wound on brass or galvanized wire, either round or flat.

Dredging Sleeves

Dredging sleeves constitute one of our specialties. They are made of the best materials, combining long life with pliability.

Tubing

Rubber tubing for electric wiring, suitable for insulation purposes and capable of being bent to any shape when heated and taking a permanent set on cooling.

Matting

There are many places in and about a power plant where rubber mats are not only clean and ornamental, but a safeguard as well because of their insulating qualities. We can supply these in a large variety of pattern and weight.

NEW YORK BELTING & PACKING CO.

New York, N. Y........91-93 Chambers St.
Pittsburgh, Pa.............420 First Ave.
San Francisco, Cal.........519 Mission St.
St. Louis, Mo.........218-220 Chestnut St.
Philadelphia, Pa..........821-823 Arch St.
Chicago, Ill............124-126 W. Lake St.
Spokane, Wash.........157 So. Monroe St.
Boston, Mass..................65 Pearl St.

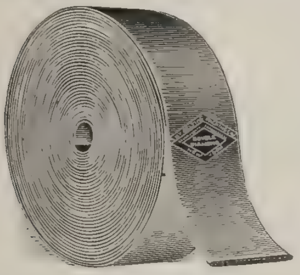
Factories: Passaic, N. J.

AGENCIES IN ALL PRINCIPAL CITIES

Manufacturers of

Mechanical Rubber Goods

Transmission Belting



Made in various grades to meet the different conditions of service. With over 70 years experience in belt making and thorough investigation in the field we are in a position to give you the most satisfactory belt for the service for which it is required. Our DOUBLE DIAMOND brand is specially recommended.

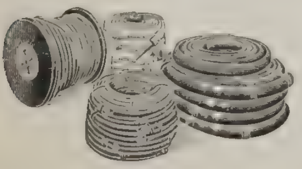
Conveyor Belting

Our "INDESTRUCTIBLE" brand is characteristic of its name. A perfect belt, made of extra heavy selected and specially woven cotton duck, the rubber friction, which binds the plies together of the highest quality. The reinforced rubber cover, 1-16″ to ¼″ thick is specially compounded to meet the service conditions under which the belt is used and guaranteed to prove ECONOMICAL AND EFFICIENT in conveying all abrasive materials such as cement, ashes, coal, rock, coke, sand, gravel, ore, etc.

Steam Hose

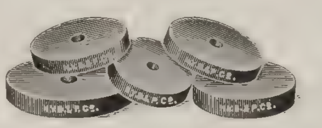
Indestructible Steam Hose is made with a woven jacket between the outer ply of cotton duck, and the rubber cover. Reducing to a minimum, the expansion of the hose under pressure, and preserving at its maximum strength the adhesion of the rubber friction uniting the plies, thus greatly prolonging the life of the hose.

Hose



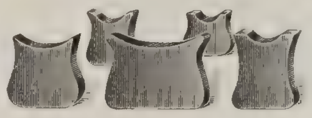
For Coke, Air, Hot or Cold Water, Steam, Gas, Suction, Fire Protection, and all other purposes for which rubber hose is used. Each the best for its intended purpose, and guaranteed to give adequate service commensurate with its cost.

Pump Valves



The manufacture of rubber pump valves that will wear is a distinct science in rubber mixing. This is especially so in valves for high lift mine pumps, oils, fire engines, waterworks and high-speed pumps. We have valves for every kind of service, and with a full knowledge of all the conditions we guarantee satisfactory results.

Sheave Filling or Wire Rope Transmission Packing



We have a very large assortment of moulds and are able to supply proper filling for almost any pulley without mould expense. The stock is tough and durable, especially compounded to resist the friction of the wire rope.

Cobbs High Pressure Packing

still continues to hold the record for service on high pressure steam and air compressors in coal mines. Where Cobbs packing is used you hear of no scored rods or "shutdowns"; that's why it is called the ideal packing. The high grade rubber cushion gives it the necessary spring, the duck cover protects the cushion, over which it has a fine asbestos cover, to resist intense heat.

If you have not used it, give it a trial and prove it to your own satisfaction. Sample sent on request.

Waterproof Hydraulic, Style 114,

we recommend for your deep mine pumps. It has proven to be the most serviceable where pumping sulphurous water containing grit and particles of coal. It is guaranteed to stand a pressure of 3,000 pounds. This is not a new packing, but is the only one that has given real success. Sample sent on application.

PEERLESS RUBBER MFG. CO.

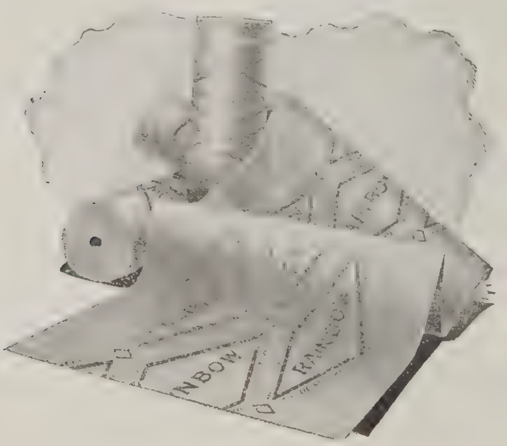
General Offices, 31 Warren St.

NEW YORK

130 W. Lake St., CHICAGO
122 N. 13th St., PHILADELPHIA
36 Oliver St., BOSTON

Get the Genuine RAINBOW PACKING

The original RED Sheet. Never hardens nor "blows" and needs no "following-up."



For any air, cold or hot water or steam joint, and is absolutely dependable under all conditions of service.

Standard Rolls 36″ wide, 100-200 lbs. Thicknesses 1-32, 1-16, 3-32, 1-8, 3-16, 1-4 ins.

Honest John Hydraulic Packing

is for all kinds of hydraulic service. It will outwear, many times over, ordinary flax generally used.

Peerless Piston and Valve Rod Packing

is for any rod NOT used with superheated steam, where we do not recommend it.

Peerless Sheet, Coil, Spiral and Ring Packings

are for any and all service conditions—especially for those of highest pressures and temperatures.

Peerless Hose—especially Perfected Constructed

is for every place where hose of any nature is used.

4810 Air Hose

is the strongest, lightest, most flexible, and oils do not harm the inner tube. For any place where air hose is required.

Peerless Belting

consists of all kinds—both friction surface (headed by our own RAINBOW) and rubber surface for power transmission, conveying and elevating.

The above represent Highest Quality both in the Materials and in the Construction.

Peerless Pump Valves

especially 630 for Hot Oils, or Hot Water, are guaranteed for all pumping conditions.

Peerless Products

are so well known and so extensive in their scope and variety that a lengthly description is not needed—nor possible—at this time.

If you wish full information, prices, etc., call on or write to any of the above addresses.

QUAKER CITY RUBBER COMPANY

PHILADELPHIA, PA.

Branches
CHICAGO PITTSBURGH NEW YORK

Manufacturers of

High Grade Rubber Belting, Hose, Packings, and Rubber Goods for Mechanical Purposes

Products.

Belting—(For the Transmission of Power; Conveying of Materials, Coal, Coke, Ores, Gravel, Cement, Sand, Grain, etc.)

Hose—for all purposes (Steam, Water, Air Drill, Pneumatic Tool, Fire, Mill, Chemical, Acid, Suction, Oil, Sand Blast, Coke, Boiler Washout, Turbine, etc.)

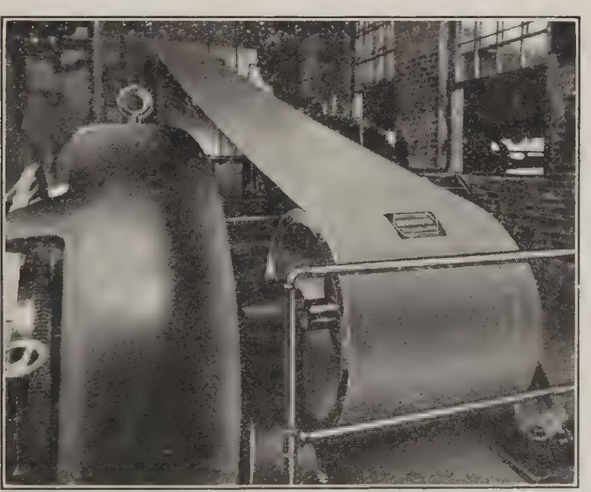
Packings —for Piston, Pump and Valve Rods of all descriptions, and in Sheet Form for Joints and Flanges.

Pump Valves, Gaskets, Tubing, Dredging Sleeves, Mats and Matting, Moulded Goods, etc. Automobile Tires and Tubes.

Complete Catalogue sent on request, address Desk C.

Rubber Transmission Belting.

Rubber Belting is superior to other kinds of belting, as it is made of uniform width and thickness, and can be used in dry, damp or wet places, and can be exposed to the weather. In cost it is much lower than leather, grips the pulley firmly and does not have the tendency to slip.



36" 10-Ply IRONSIDES drives this air compressor day and night.

IRONSIDES is a frictioned surface belt in a class of its own, being the ultimate in belt quality. The plies will not seperate and the surface texture insures the maximum tractive power.

QUAKER CITY—A superior belt manufactured with the most scrupulous care. Made on 32 oz. cotton duck especially woven to stand great strain.

CROWN—A strictly high grade belt. For use where conditions are not extraordinarily severe this belt will give entire satisfaction.

Rubber Conveyer Belting.

For the conveying of ore, sand, gravel, stone, coal, grain, etc.

Conveyer belting can be furnished on short notice for any purpose, any length, width or thickness desired.

Every detail in the manufacture is given special factory inspection. In the construction, extra heavy duck with exceptionally strong friction is used. The quality of the cover on both the carrying and pulley sides of the belt insures the maximum of service, as it will withstand the action of the material conveyed and the wear from the pulleys.

Furnished with reinforced cover on the conveying side, varying from one sixteenth to one fourth inch according to the class of work required.

Desert—Conveyer Belt is designed to give maximum service under conditions that would make the use of lower grade belting considerably more expensive in the end. The cover of this belt is made of a compound that successfully withstands the wearing effects of the materials handled; the duck is a special weave of extraordinary weight, frictioned with a tenaciously gripping friction. In all the essentials of a belt for conveying purposes, DESERT is easily the leader.

Crown—is for general service under conditions that ordinarily wear out belts quickly.

Hercules—is a thoroughly good belt for the lighter class of conveying duty, i. e. where the work is not continuous or the material handled is not of an abrasive or destructive character.

Daniel's P. P. P. Rod Packing

This unquestionably is the finest rod packing. It is the original and only genuine self-setting rod packing on the market. Unequalled for the packing against steam, water, air, ammonia and other fluids on engines, pump and compressor rods, etc.

Ebonite Sheet Packing

Ebonite has been found to be the most serviceable packing for high pressures, superheated steam, hot water, ammonia, oils, acids and all other kinds of joints requiring packing.

Furnished in rolls 36 inches wide and in thicknesses of 1-32, 1-16, 3-32, 1-8, 3-16 and 1-4 inch. Also wire and cloth insertion if desired.

Trade Mark
Reg. U. S. Pat. Off.

Packings

Of all kinds for piston and valve rods in ring, spiral or coil forms. Sheet packing for flanges and joints.

Hose

For every purpose. Each grade and brand is made with special care to render the best service for which it is intended. Water, Steam, Air Drill, Pneumatic Tool, Fire Protection, both indoor and outdoor, Suction, Mill, Chemical, Oil, Sand Blast, Coke, Boiler Washout, etc.

Pump Valves

Valves for hot or cold water, ammonia, acids, oils, air, condensers, blowing engines, boiler feed-water pumps, mine pumps, marine pumps, air pumps, etc.

There is a Quaker valve specifically made for every purpose to perform a certain duty. Give conditions where valves are to be used, also size required, and the valve that will give maximum service will be furnished.

Moulded Goods, Mats and Matting, Gaskets, Tubing, Washers, Diaphragms, etc., etc.

THE NEW YORK CORDAGE CO.

83, 85 Wall Street, New York

Manufacturers of

Manila Transmission and Hoisting Rope

"Nycord" Stands For Quality

TRADE MARK REGISTERED

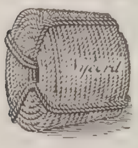
Manila Transmission Rope. Our Weatherproofed "Nycord" Brand.

1.—Needs no artificial dressing.

2.—Lasts longer than any other kind.

3.—Costs no more than inferior brands.

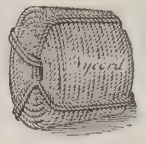
TRADE MARK REGISTERED



Our Gurantee

Any "Nycord" Transmission Rope put on the same sheave at the same time as the rope made by any other concern in the United States or elsewhere and failing before the other rope will be replaced by us gratis.

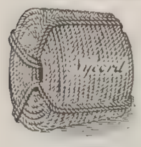
TRADE MARK REGISTERED



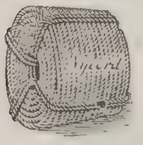
Manila Hoisting Rope

Made in all sizes from ⅛" to 6" diameter. 3 and 4 strand.
Write for samples and prices.

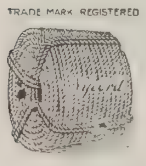
TRADE MARK REGISTERED



TRADE MARK REGISTERED



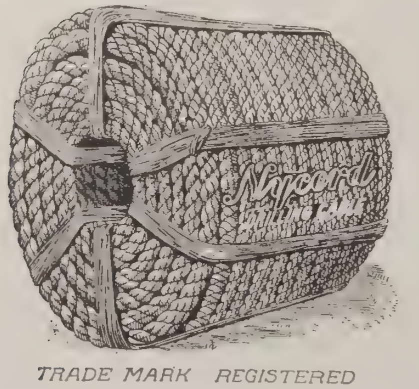
TRADE MARK REGISTERED



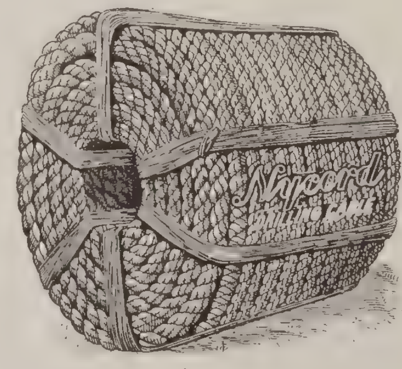
Mr Contractor - Mr. Driller:

Do you know that by writing us direct you can save 20 to 25% on your Cables & Cordage, & at the same time get more hole per foot than with any other rope. In buying from the middle man you not only pay him a fat profit, but also a bonus to cover bad debts from those who do not pay at all, while we sell our Cables for Cash at the least margin over actual mill cost. Write us to day.

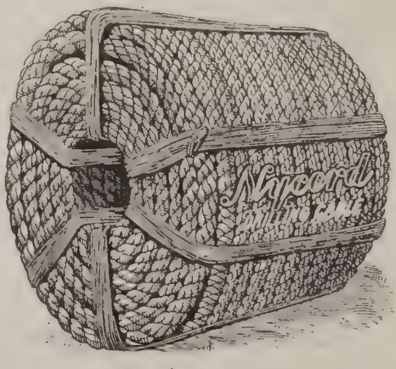
New York Cordage Co.,
Cable Dept. 83,85 Wall St NY



TRADE MARK REGISTERED



TRADE MARK REGISTERED



TRADE MARK REGISTERED

DODGE SALES & ENGINEERING CO.

MISHAWAKA, INDIANA

Distributor of the Products of

Dodge Manufacturing Company

"Everything for the Mechanical Transmission of Power"

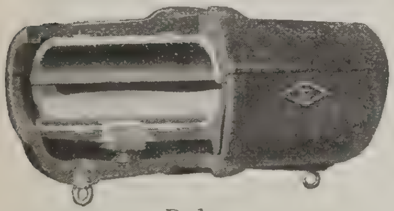
The Dodge line of power transmission machinery, built on quality and service principles, is perhaps the oldest, most extensive and most widely used of any similar line in America.

Dodge Standard Split Iron Pulley.

No better pulley is manufactured than our metallic pulley, the "Standard" Iron Split. Made for quick and easy installation, it is available for a variety of shaft sizes by means of split bushings, is held in position by compression alone and is round, true and in balance.

In our hangers and pillow blocks there is a combination of maximum strength and minimum waste, with a true ball and socket principle in bearing supports. They have adjustable plunger screws and detachable brace links.

Hangers and pillow blocks cannot produce the desired results without the proper bearings, and to meet the requirements we are offering an automatic self-lubricating type, in capillary, ring and chain. With an occasional filling they require practically no attention, give a smooth running bed for the shafting, save oil, expense of oiler, possible accidents and damage suits.



Dodge Capillary Bearing

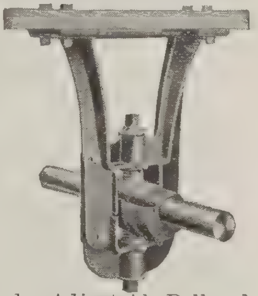
And there is the Dodge split friction clutch, an appliance that places factory departments, lineshafts, countershafts, or machines under instant control. It is a safeguard to life and limb, and a wonder worker in power and time saving.

Other items of the line include collars and couplings for all classes of service, and complying with legal requirements by having set screws and protected bolt heads and nuts.

Complete stocks of iron and wood split pulleys, hangers, pillow blocks, bearings, collars, couplings, clutches, shafting, etc.—standardized and interchangeable—are carried in thirteen important distributing points—New York, Boston, Providence, Philadelphia, Pittsburgh, Cincinnati, Atlanta, St. Louis, Portland, Ore.; Seattle, Minneapolis, Chicago, Providence, Newark and at Mishawaka, Indiana.

These stocks include all the necessary sizes and parts and are carried in immense quantities, making it possible to fill complete orders the same day they are placed.

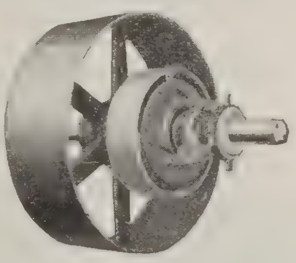
Each branch and warehouse maintains a machine shop and an engineering department.



Dodge Adjustable Ball and Socket Hangers

Dodge goods constitute a premier line. They are well designed, well made and satisfy the user. They are backed up by an old, established concern and an organization of men who are familiar with every detail of modern manufacturing.

We would be pleased to go over the power transmission problems or requirements of any factory manager, superintendent, chief engineer or purchasing agent.



Dodge Solid or Split Friction Clutches

CLING-SURFACE COMPANY

Cling-Surface
the life preserver for belts

1015 Niagara Street; Buffalo, N. Y.

BRANCH OFFICES AND AGENTS ALL OVER THE WORLD.

Manufacturers of

BELT PRESERVATIVE

Cling-Surface
the life preserver for belts

Product

Cling-Surface for the treatment of belts and ropes.

A Basis For Scientific Belt Management

Prof. R. C. Carpenter proved at Cornell University that Cling-Surface is instrumental in effecting substantial increases in efficiency in belt transmission.

14 in. motor belt transmitting 100 h. p. to air compressor in a mine plant. Under Cling-Surface treatment this belt runs so slack that the sides nearly touch, yet there is no slip.

Cling-Surface furnishes a basis for intelligent systematic treatment of transmission belting and ropes on main engine, motor, pump and compressor drives, etc., for ultimate as well as immediate efficiency and economy.

While primarily keeping belts, ropes and conveyor belts preserved, pliable, waterproofed and always in the best condition, Cling-Surface treatment is even more useful in keeping internal friction load at a constant minimum.

The Improvements Effected Outside Of the Belts

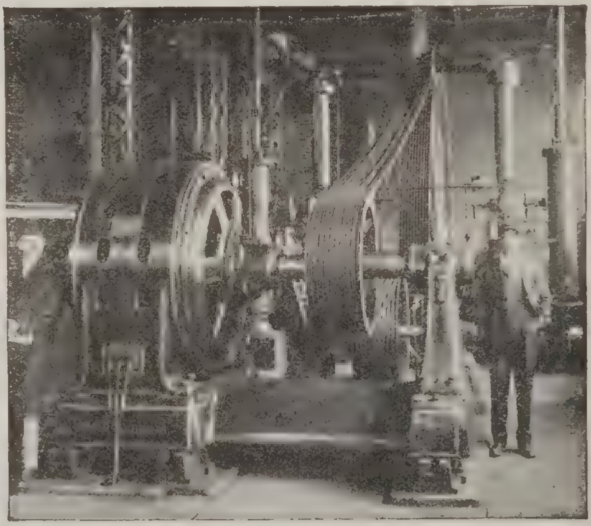
A belt treated with Cling-Surface may be eased or slackened, yet pulls its load without slip and without other initial tension than produced by the weight of the belt. The strain on the belt, shafting, hangers, pulleys, engine and man in charge is thus greatly relieved, while journal friction is reduced to the minimum, which of course means a decided saving of power, lubricants, bearings, and attention, and a lessened danger of shutdowns.

The Preservative Action

Cling-Surface prolongs belt life and prevents slip by penetrating, surrounding and lubricating each internal fibre, making the interior flexible, and leaving the surface mellow, clinging and clean. It is a food to take the place of the natural belt lubrication as this becomes spent. Thus internal drying out and surface cracking and burning are effectively prevented and the entire belt is rendered impervious to moisture, steam, climatic changes and the like, and dust or oil falling upon the surface are less apt to interfere with transmission. The action of Cling-Surface is equally beneficial for all kinds of leather, painted and unpainted canvas, and camel hair belts and can also be used for good balata and rubber belts.

The Effect On Ropes

Cling-Surface treatment does everything for rope drives that it does for belting. It prevents rotting by preventing the penetration of moisture and produces within a sliding action to replace the grinding that ordinarily disintegrates the core fibres. The improved contact between ropes and sheaves permits a reduction of weight on the tightener, and thus also a noticeable power saving and lengthening of rope life is effected.



Cling-Surface-treated rope transmitting 200 h. p. Ten 1⅛ in. ropes 38 in. sheave on motor. 22 ft. sheave on 54 r. p. m. compressor. Cling-Surface caused the tension weights to be reduced about 25 per cent.

GEM MANUFACTURING CO.

Offices & Works Pittsburgh, Pa.

Manufacturers of

GEM GUARANTEE GOODS

Products

- Hand Oilers, Steel Brass Oilers, Heavy Brazed Steel Oilers,
- Cadgers
- Mine and Pit Car Oilers
- Fillers
- Tallow Pits
- Grease Buckets
- Oil Cans
- Shop Torches
- Flue Scrapers
- Locomotive Oilers
- Flexible Shafting and Attachments
- Counter Shafts
- Breast Drills and Drill Presses
- Universal Joints
- Portable Grinders and Drills, Motor or Rope Drive for Special Mine Work.

We make a specialty of Rush Orders for machine work.

MR. MINE SUPERINTENDENT OR PURCHASING AGENT, upon request, we will send you Catalogue No. 8, giving complete description of the above mentioned products, also samples of Brazed Seam Oilers, Torches and Oil Cans free of charge.

BRAZED SEAM GOODS are economical, because of their durable construction. To braze our products, it takes 1800 degrees of heat, whereas the ordinary solf-soldered competitve goods are soldered at 350 degrees heat.

Brazed Seam goods can be heated to a red heat without causing them to leak. Although the initial cost of Brazed Seam goods is a little higher, in the end they are the most economical. One Brazed Seam Oiler, Torch, or any other Brazed Seam article, will last from five to ten times longer than the ordinary competitive article.

Heavy Brazed Steel Tallow Pots

No.		List Pr. per doz.
45 H	1-qt. Tallow Pot..	$13.00
47 H.	2-qt. Tallow Pot..	15.00
48 H.	3-qt. Tallow Pot..	17.00
49 H.	4-qt. Tallow Pot..	18.00
With Strainers, extra		2.50

Are so constructed that strainers are removable.

You cannot injure these Tallow Pots by placing them on a fire to heat the tallow.

Heavy Brazed Steel Oil Carriers

Screw Top		List Price, Each
No. 60 H.	1-gallon Carrier	$2.00
No. 61 H.	2-gallon Carrier	2.50
No. 62 H.	3-gallon Carrier	3.00
No. 63 H.	4-gallon Carrier	3.50
No. 64 H.	5-gallon Carrier	4.00
With Strainer, extra		.25

Are so constructed that Strainers are removable.

Any capacity of larger sizes made to order.

Very heavy steel.

Extra heavy bail and lugs.

Seams hard spelter brazed.

For factory and railway use.

It is perfectly safe for storage.

Heavy Brazed Steel Pyramid Torches

		List Price, Per doz.
No. 80 H.	½-pt. 1 burner Pyrmid Torch	$ 7.00
No. 81 H.	1-pt. 1 burner Pyramid Torch	9.00
No. 82 H.	1-qt. 1 burner Pyramid Torch	10.00
No. 83 H.	1-qt. 2 burner Pyramid Torch	11.00
No. 84 H.	2-qt. 1 burner Pyramid Torch	12.00

You cannot secure a stronger Torch than those we manufacture.

Guaranteed not to leak.

Seams heavy spelter brazed.

Extra heavy handle, securely riveted .

Drawn steel tops

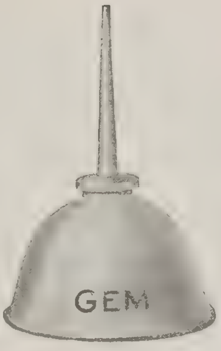
For factories, foundries, rolling mills, blast furnaces, construction work, is a stout, durable Torch.

Gem Plain Brazed Steel Bench Oilers

Tempered Steel Bottoms

	Capacity	Spout	Diam.	List Price Per doz.
No. 1603.	⅓ pt.	3 in.	3⅜ in.	$4.75
No. 1604.	⅓ pt.	4 in.	3⅜ in.	5.00
No. 1606.	⅓ pt.	6 in.	3⅜ in.	5.50
No. 1609.	⅓ pt.	9 in.	3⅜ in.	6.00
No. 1703.	½ pt.	3 in.	3¾ in.	5.75
No. 1704.	½ pt.	4 in.	3¾ in.	6.00
No. 1709.	½ pt.	6 in.	3¾ in.	6.50
No. 1709.	½ pt.	9 in.	3¾ in.	7.00
No. 1803.	¾ pt.	3 in.	4⅛ in.	6.75
No. 1804.	¾ pt.	4 in.	4⅛ in.	7.00
No. 1806.	¾ pt.	6 in.	4⅛ in.	7.50
No. 1809.	¾ pt.	9 in.	4⅛ in.	8.00
No. 1903.	1 pt.	3 in.	4½ in.	7.75
No. 1904.	1 pt.	4 in.	4½ in.	8.00
No. 1906.	1 pt.	6 in.	4½ in.	8.50
No. 1909.	1 pt.	9 in.	4½ in.	9.00

The 6 and 9 inch spouts are furnished bent unless otherwise ordered.



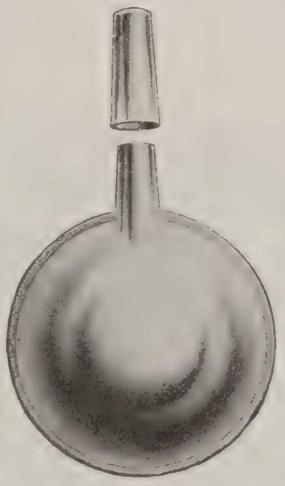
Oilers are made of No. 20 B. & S. gauge COLD ROLLED STEEL. All highly polished. GUARANTEED.

Bushings of solid brass castings, machine cut.

Leather washers are cut from split sides.

All lengths of spouts are interchangeable.

Oilers copper or nickel plated to order.



Gem Steel Cadger

A strong and durable carrier for miners' reserve oil supply. Made of heavy cold rolled steel, with double rolled side seam spelter brazed. Heavy tapered spout, spelter brazed to body of can, with tapered cap of same gauge, making tight joint without screw thread.

Cap easily removed.

Practically indestructible.

Will outlast half a dozen ordinary tin Cadgers, and costs but little more than one.

Fits the pocket.

Always with you.

½-pt., per gross, list price....$36.00

Heavy Brazed Steel Mammoth Or Pit Car Oilers

			List price
No. 36 H.	1-qt. Pit Car Oiler,	8 in. spout,	$16.00
No. 37 H.	2-qt. Pit Car Oiler,	10 in. spout,	18.00
No. 38 H.	3-qt. Pit Car Oiler,	12 in. spout,	21.00
No. 39 H.	4-qt. Pit Car Oiler,	12 in. spout,	24.00

All spouts furnished straight unless ordered bent.

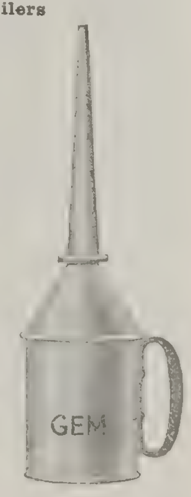
Any length spout, straight or bent. Sizes all interchangeable. Large opening for heavy oils.

EXTRA NOZZLES

Length, inches	8	10	12	18
Price, per dozen	$2.75	3.00	3.25	3.50

Guaranteed not to leak. Seams hard spelter brazed.

Do not compare the above goods with the ordinary soft soldered, light steel or tin oilers.



Write for Discounts.

WIILLIAM RENTON, INCORPORATED

101-103 Water Street
PITTSBURGH, PA.

Cylinders Rebored in Present Position

Cylinders

We re-bore cylinders in their present position for Steam, Mining, Blowing, Hoisting, Pumping, Hydraulic and Gas Engines, Cylinders for Steam Hammers, Air Compressors and Refrigerating Machines, Etc.

Fly Wheels, Gear Wheels, Etc.

We also re-bore in present position Fly Wheels, Housens, Large Gear Wheels, Bearings for Shafts, Engine Guides, Corliss Valve Seats, Piston Valve Seats, Bushings, Etc.

For Quick Service.

To save time, we frequently send our men to your plant, measure up the Cylinder for new Piston Heads, Rods and Packing and have them on the ground, when the boring is done, ready to put in the Cylinder, thus saving Time, Labor and Expense.

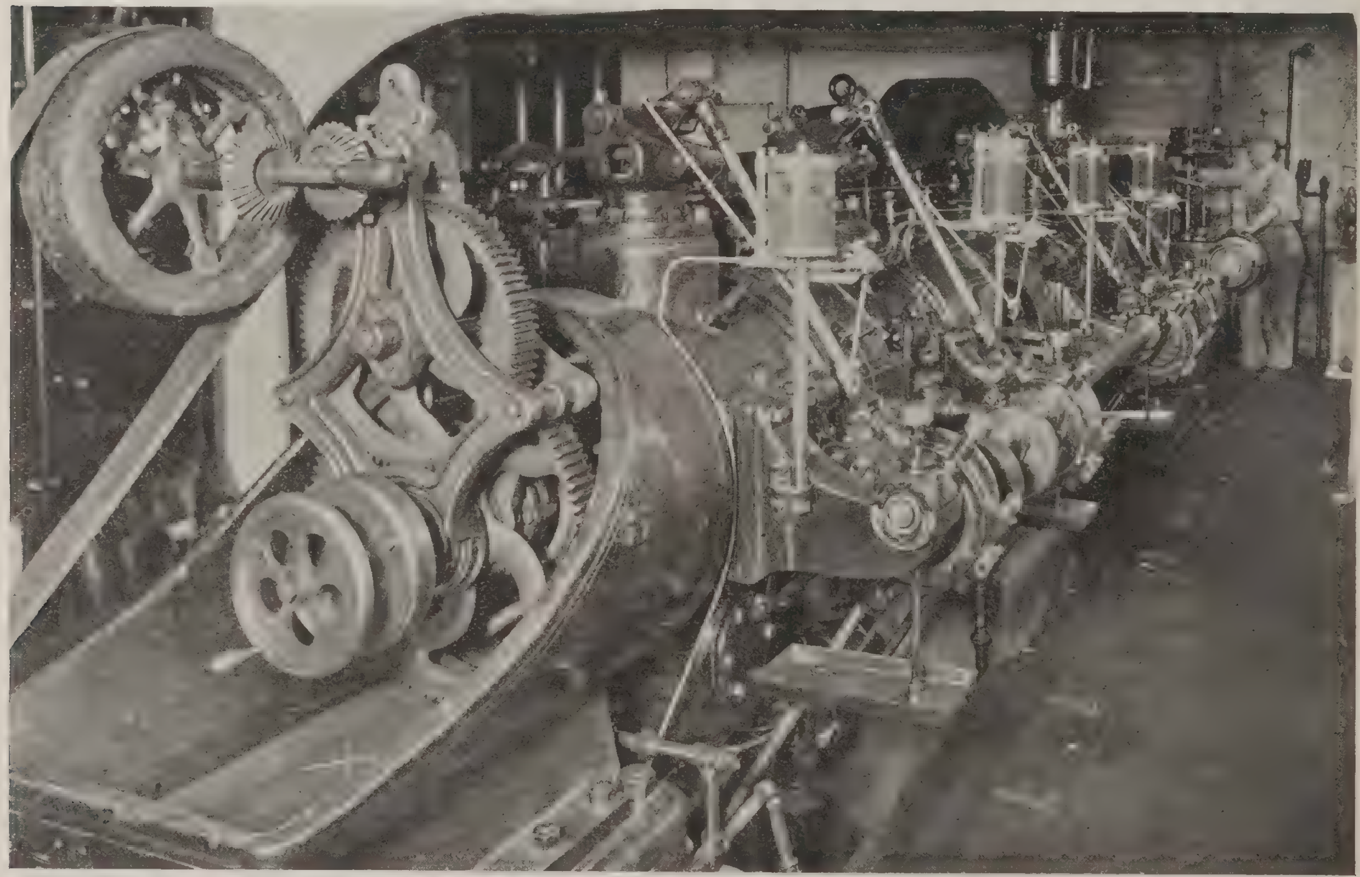
Bushings.

Should you desire to have your Cylinders rebored and bushings, either Cast Iron, Brass or Steel furnished to fit same, we are enable to do quick work and make a good job.

At Your Plant.

At your plant, we can re-bore your Cylinders,, upright or horizontal, re-bore the Corliss Valve Seats, Plane up Slide Valve Seats, re-bore Wrist Pin Holes, either straight or taper, turn up the Wrist Pin bearings, re-bore your Engine Guides, Babbitt and rebore the bearings for your Engine Shaft, Etc.

Corliss and Other Makes of Engines Repaired Promptly.



KEYSTONE
CONSOLIDATED PUBLISHING COMPANY INC.
THE MINING CATALOG
COMBINED WITH
COAL FIELD DIRECTORY

LUBRICATING SECTION

The following manufacturers have catalogue descriptions in this section:

Atlantic Refining Co.
Cataract Refining & Mfg. Co.
Dixon, Joseph Crucible Co.
Keystone Lubricating Co.
New York & New Jersey Lubricating Co.
Ohio Grease Co.

For additional descriptions of General Equipment, not appearing in this section, refer to Index of Products in front of book.

THE ATLANTIC REFINING COMPANY

PHILADELPHIA PITTSBURGH

One of the Largest Manufacturers of

Lubricating Oils and Greases in the World

POWER PLANT

Atlantic Red Engine Oil

Universally adopted for general machinery lubrication.

Renown Engine Oil

Greatest of all lubricants for high-speed machinery, dynamos and motors.

Premier Turbine Oil

A pure, non-emulsifying mineral oil, unexcelled for turbine-lubrication where quick separation from water is necessary.

Capitol Cylinder Oil

For years has been the acknowledged standard for durability and power-saving; well adapted to the lubrication of large, heavy engines and pumps.

Arctic Cup Grease

A high-grade lubricant for use where mechanical conditions preclude the use of oil; for use in spring or compression cups, or in boxes, and adapted to all manner of uses, crank-pin shafting, pulleys, crossheads, friction clutches, eccentrics, valve motions, slides or main journals.

Ario Compressor Oil

For the successful lubrication of the high-pressure compressors. Will not burn readily at the elevated temperatures, and works splendidly at all ordinary working pressures.

MACHINE SHOP

Junior Red Engine Oil

The ideal for general machine-lubrication.

Union Thread-Cutting Oil

The oil that insures a clean-cut thread and keeps the dies in first-class shape. It has proved its worth wherever tried.

Atlantic Tempering Oil

To temper the finest steel to any degree of hardness.

CABLES

Reliable Cable Coating

The standard of cable-coating with a degree of penetration, supplying the strands of the cable with the proper lubrication and the desired preservation. Reliable Cable Coating contains no free acid and will not in any wise harm the cables.

Atlantic Rope Grease

For the preservation and lubrication of hemp cables.

BREAKER

Atlantic Black Oil—Dark Gear Grease—Pinion Grease will take care of all the gear-pinions and heavy parts and give the best of satisfaction.

MINE CARS

Eureka Grease for Mine Cars

The lubricant that solves the problem of mine-car lubrication. Made for efficient service; has a density that meets all climatic conditions the year round, eliminating the wages of your car-oiler. Easily applied and requiring no attention. The grease that does not require friction heat to make it flow to the axle, and eliminates the loss from leakage that occurs with the use of oil. Greatly reduces the cost of mine-car lubrication.

OIL HOUSE

For your stock of oils there should be at all times a full supply of **Atlantic Miners' Oils** and **Miners' Sunshine Wax. Miners' Sunshine** gives the greatest amount of light with the least amount of smoke and fumes.

Atlantic Lubricating Oils and Greases used the world over because their superiority has long been recognized.

CATARACT REFINING & MFG. CO.

General Offices,

Marine Nat'l Bank Bldg. BUFFALO, N. Y.

Eastern Department,
17 Battery Place, New York City.

Western Department,
327 So. La Salle St., Chicago, Ill.

Plants,
Buffalo and Chicago

Warehouses,
New York, Boston, Buffalo, Detroit, Chicago, San Francisco, Toronto, Ont.

MINE LUBRICANTS

Calypsol No. 50 Mine Car Grease, for reservoir wheels, plain bearings.

Calypsol No. 52 Mine Car Grease, for roller bearings.

Calypsol Car Journal Grease and Car Journal Yarn, for open boxes for yarn packing.

Plumbago Hair Car Grease, for open boxes. (Combined packing and lubricant).

Bison Cable, Gear and Chain Grease (Nos. 20, 21, 22, 23, 24), for gears, chains and cables.

Calypsol Transmission Greases (Nos. 30, 31, 32, 33), for transmission gears in drills, etc.

Monarch Lubricant (Nos. 00, 0), for ring and chain oilers.

Monarch Lubricant Nos. 1, 1½, 2), for funnel cups.

Bison Grease (Fibre), (Nos. 0, 1, 1½), for funnel cups.

Monarch Lubricant (Nos. 2, 3, 3½, 4, 5), for compression and screw cups.

Calypsol No. 62 Compound, for compression and screw cups.

Monarch Cylinder Grease, for steam cylinder lubrication.

Bison Shafting Grease and Yarn, for line shafting, fan bearings and other journals, in connection with Bison Cap System of lubrication.

Plumbago Lubricant (All consistencies), for general use where Graphite Grease is desired.

All our greases are manufactured in our own plants at Buffalo and Chicago.

We make the most complete and largest line in America.

Special booklets and reliable data will be furnished upon application.

JOSEPH DIXON CRUCIBLE COMPANY

JERSEY CITY, N. J

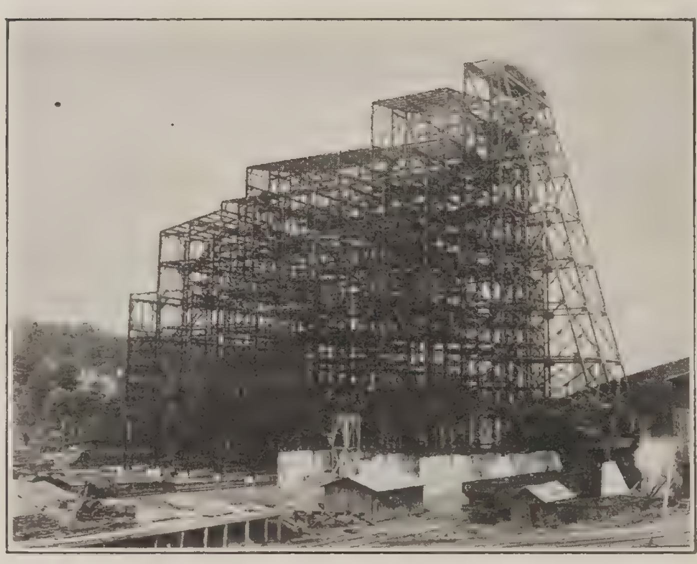
PHILADELPHIA BRANCH, 1020 ARCH ST.

Dixon's Graphite Productions

Dixon's Silica-Graphite Paint

"The One Quality Paint"

Measured by years of service, Dixon's Silica-Graphite Paint is more economical than any other protective paint. It is recommended and used extensively for the preservation of all steel and iron structures.



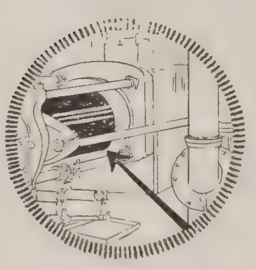
Wanamie Breaker of the Lehigh and Wilkes-Barre Coal Co., Wanamie, Pa. All structural steel preserved by Dixon's Silica-Graphite Paint.

Dixon's Waterproof Graphite Grease

Composed of high grade petroleum grease with which is incorporated a certain proportion of DIXON'S SELECTED FLAKE GRAPHITE.

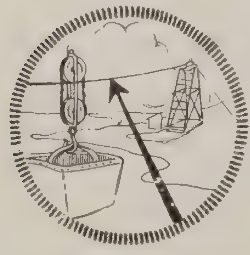
For Pump Plungers

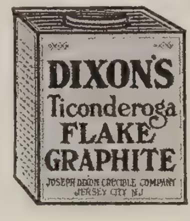
It will not wash off the rod (providing rod is dry when application is made). It stays there and lubricates. MINE PUMPS handling acid, alkaline or dirty water take a new lease on life when this grease is used, because it effectually protects the packing and prevents scoring of the rods. The graphite is there for severe service when trouble comes.



For Wire Ropes

The most perfect source of protection against both wear and corrosion of wire ropes is Dixon's Waterproof Graphite Grease. It penetrates to the innermost strands, keeps them well lubricated and thus minimizes internal friction. Being insoluble in water and unaffected by acids, alkalies, or corroding atmospheric conditions, this grease "stays" with the rope and guards against all damaging influences.





Dixon's Ticonderoga Flake Graphite

Of great value as a lubricant for cylinders, valves and bearings, either alone or mixed with oils and greases. Indispensable for coating gaskets and packing.

Dixon's Graphite Cup Greases

Due to the flake graphite in these greases, they give longer and better service than is possible with ordinary cup greases. Prepared in six degress of hardness.

Dixon's Graphite Brushes

For dynamos and motors. Prevent wear of the segments, save resurfacing of the commutator, stop sparking and pitting. Give most satisfactory service.

Dixon's Graphite Center Plate Grease

For lubricating center and side bearings of cars.

It is a heavy-bodied grease in which is incorporated a suitable proportion of flake graphite, so that long after the grease itself has disappeared from the bearing surfaces, effective lubrication is afforded by the graphite flakes that have become attached to the metal. Its use makes a train flexible and consequently prolongs life of wheels and saves in tractive power.

Dixon's Graphite Curve Grease

Dixon's Graphite Curve Grease meets the demand for a durable lubricant for curves and switches at a low price. Saves wear of track and wheel flanges, and is much more economical in all respects than cheap black oils and greases.

In ordering specify whether for winter or summer use.

Lubricants

Prepared in various grades for the lubrication of wheel, journals of electric cars, engines, freight and passenger cars, ore cars, mine cars, etc.

Quality is the keynote of the success of these graphited lubricants. They cost a little more at first but are cheaper in the end. Furnish best service all the time.

State your problem.

Dixon's Boiler Graphite

(Fine Flakes)

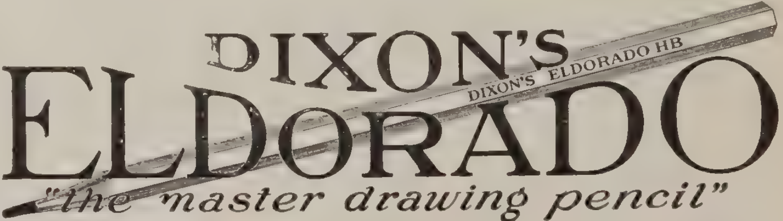
The Pioneer Boiler Graphite. "It's all in the Flakes."

Its Action—

Purely mechanical.

Its Use—

- Lessens the time required for boiler cleaning.
- Noticeably increases the steaming capacity.
- Reduces fuel consumption.
- Minimizes repairs.
- Improves operation of feed pumps.
- Increases life of valves and gaskets.
- Prolongs the life of boilers.



Circulars, giving detailed information on above, sent on request.

KEYSTONE LUBRICATING CO.

Manufacturers of Petroleum Lubricants

21st., Lippincott and Clearfield Streets,
PHILADELPHIA, PA.
ESTABLISHED 1884.

BRANCHES, OFFICES AND WAREHOUSES:

NEW YORK	1777 Broadway
CHICAGO	3633 to 3645 So. Racine Ave.
NEW ORLEANS	609-15 Chartres Street
PITTSBURGH	Jenkins Arcade
BOSTON	141 Milk Street
DENVER	First National Bank Building
SAN FRANCISCO	268 Market Street
SAVANNAH	141 Drayton Street

The principal branch office for the bituminous coal fields is located in the Jenkins Arcade, Pittsburgh, Pa., where extensive Sales and Mechanical Engineering Departments are equipped to render valuable service to the coal mining industry.

Agencies in the Principal Countries Throughout the World

Products

Keystone Grease (several densities), Keystone Wool Yarn Grease, Keystone Turbine Oil, Keystone Cylinder Oil, Keystone Motor Oil, Keystone Gas Engine Oil, Velox Gear Grease, Keystone Wire Cable and Manilla Rope Greases. Keystone Grease is made in different densities for various uses and is suitable for use on every type of machinery, whether light or heavy, high or low-speed. It will not change consistency under either ordinary or extremely severe working loads and temperatures. The same density is used both summer and winter, since it is not affected by atmospheric changes of heat or cold.

Keystone Grease possesses the much-desired clinging quality that oils and animal oil greases lack. It tends naturally to stay in the bearings and will keep them cool at extremely severe as well as moderate loads. Keystone Grease does not soften and cannot be fed exactly as are animal oil greases. If a heavy density is forced into the bearings under pressure,—such as feeding through spring automatic or hand compression cups, it forces out grease which would otherwise stay in the bearing indefinitely. Care should therefore be exercised and the grease applied sparingly, for a little Keystone Grease goes a long way.

LUBRICATING MINING MACHINERY EFFICIENTLY.

Motor Lubrication

It requires only efficient lubrication to give to mine locomotives a greatly increased haulage efficiency and much longer life to their bearings. It is easy to demonstrate that Keystone Grease will afford this result at a cost considerably below that of oil or ordinary grease.

Oil naturally runs off nearly as fast as it is applied and generally does not have sufficient body to furnish lubrication for such work, even if it could be retained. Ordinary greases are affected by frictional and electrical heat and sooner or later escape in the same manner.

There is nothing mysterious about the performance of Keystone Grease—it stays in the bearing and every particle of it furnishes lubrication. It does not melt and run off, leaving dry bearings and a trail of oil covered road-bed.

Keystone Grease always has the same consistency regardless of atmospheric conditions of heat and cold, furnishing a constant and even flow of lubricant to every bearing and journal to which it is applied. This naturally makes bearings wear much longer than is possible where lubrication is uneven and intermittent.

We can show you records of lubrication costs decreased by over 50%, with an increased haulage efficiency and lower repair cost.

In use, Keystone grease of proper density is used in all grease cups, with Keystone Wool Yarn grease, and Keystone Wool Yarn Elastic Grease in journal boxes.

Application is simply and easily made.

Arrangements for a conclusive test can be made without obligation.

Mine Car Lubrication

No. 119 Keystone Grease for mine cars has four qualities that are not possessed by any other lubricant of any kind, and they are the reasons for its unusual efficiency in mine car use.

First, it maintains the same density in all working temperatures, whether hot or cold. It consequetly never becomes thin and wastes, nor too thick and fails to feed.

Second, it has an even consistency, never becoming lumpy and clogging the holes leading from the reservoirs.

Third, it is not affected in the least by the chemicals with which mine water is frequently impregnated and is a natural preservative for metals to which it is applied.

Fourth, it's unusually high lubricating properties makes it economical. Its density is such that the small amount required to keep wheel and axle perfectly lubricated are fed to the axle during each rest period. **One filling of the reservoir frequently lasts three to six months and longer, without any attention whatever.**

Hundreds of mines are now using No. 119. Ask any of them what they know about it.

Cable Lubrication

If wire and manilla rope cables are to last and furnish service commensurate with their cost, they must be efficiently protected.

Keystone Wire Cable Grease and Keystone Manilla Rope Transmission Grease are particularly noted for their ability to penetrate the strands to the core and at the same time protect the exterior so that no grit or dirt can work into the cable.

They are not affected by water nor by chemicals in mine water. They are not affected by heat or cold nor will they decompose. Your cables are not getting the treatment they deserve without these particular lubricants.

THE OHIO GREASE COMPANY

Main Office and Works,
505 to 625 North Spring St.,
LOUDONVILLE, OHIO

Manufacturers of

The Ohio Brand of Lubricating Greases

Warehouses at
Philadelphia, Pa., Pittsburgh, Pa., Richmond, Va., St. Louis, Mo., Memphis, Tenn.,
Shreveport, La., Kansas City, Mo., San Francisco, Cal., Portland, Ore.

Products

Cylinder Grease, Cup Grease, Fibre Grease, Bearing Grease, Shafting Grease, Journal Grease, Transmission Grease, Auto Grease, Rope Grease, Gear Grease, and Commutator Compound; also Grease Cylinder Lubricators, Superheaters, Compression Cups, and Steel Shafting Cups.

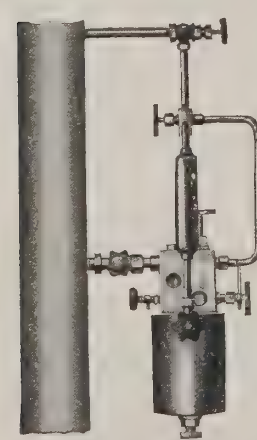
Ohio Cylinder Grease

consists of the highest obtainable grade of Pennsylvania Cylinder Stock scientifically compounded with Acidless Tallow Oil, and highly concentrated. It contains no Neutral Oils, Degras, or anything else that would tend to cheapen it or weaken it in any way. It is therefore dependable and efficient at any pressure, and under all conditions; and positively will not carbonize, or leave a residue of any kind to gum cylinders or valves.

To meet the various steam and mechanical conditions, this grease is now made in seven different grades, known as 1-V, 2-V, 3-V, 4-V, 2XL, 4XD, and 5-X. All are of the same high quality, and sell at the following prices, f. o. b. our factory:

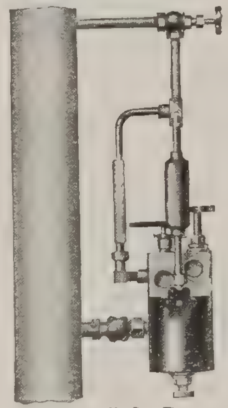
Barrels	cotaining	about	380 lbs.	@ 12c per lb.
Half-bbls.	"	"	225 lbs.	@ 13c per lb.
Kegs	"	"	110 lbs.	@ 14c per lb.

Ohio Grease Lubricators



"Class B" Or Up Feed.

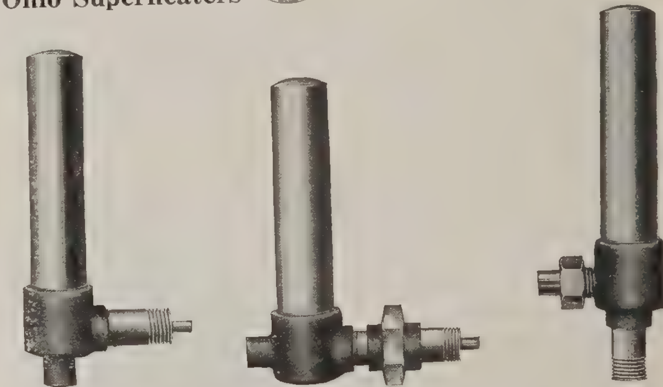
Ohio Cylinder Grease is fed through special lubricators that are furnished absolutely free for the purpose, no matter how many may be required. They are made in 1 and 2 lb. up feed; also 1, 2 and 3 lb. drop feed. They are adaptable to all kinds of steam units, and give perfect service under all conditions.



"Class D" Or Drop Feed.

These lubricators automatically heat the grease, feed it in very small drops, and then superheat and atomize each drop, thoroughly mixing it with the steam before it enters the cylinder. Thus the steam is lubricated, and deposits a thin, uniform film on all working parts. The result is perfect lubrication without waste.

Ohio Superheaters



These instruments make it possible to feed Ohio Cylinder Grease through force feed lubricators of any kind, with the same wonderful efficiency and economy as when fed through our special grease lubricators.

Superheaters are furnished absolutely free, under the same terms as our lubricators. They are very easily installed, entirely automatic in operation, and require no attention whatever.

What This System Accomplishes

This system will save you 30% on the cost of cylinder oil, 50% on packing, overcome all trouble with oil in boilers, and make your steam units run smoother and better than ever. It is doing all this, and more, for hundreds of the largest mines, and we would welcome an opportunity to prove it in your case. Write for test offer.

Ohio Cup Grease

An excellent lubricant for all kinds of machinery bearings, conveyors, etc. It contains no acids, graphite or mica, and nothing whatever enters into its composition that would in any way injure the bearing on which it is used.

Each and every atom is a lubricant of the first quality. Therefore no gum, or residue of any kind is found in the cup, or on the bearing, after its use. It has been tested against all of the well known bearing greases, and has given more satisfactory results in every instance.

This grease is made in six consistencies ranging from very soft to very hard. These are known as 1-0, 2-0, 3-0, 4-0, 5-0, and 6-0, and are sold at the following prices F. O. B. our factory:

Barrels . .	containing about 380 ℔s.	@ 10c per ℔.
Half bbls.	" " 225 ℔s.	@ 11c per ℔.
Kegs	" " 110 ℔s.	@ 12c per ℔.
50 ℔. cans		@ 13c per ℔.
25 ℔. cans		@ 14c per ℔.
10 ℔. cans		@ 15c per ℔.

Ohio Commutator Compound

Will keep your dynamos and motors in first class condition, and prevent all trouble from sparking. Let us send a sample to prove it.

2 oz. box 25c, ½ ℔. box 75c, 1 ℔. box $1.25.

Liberal samples on request.

Ohio Fibre Grease

A very high melting point grease of a spongy or fibrous nature. These properties enable it to stay where it is put, though the temperature be high, and to outwear ordinary cup or bearing grease. It is extensively used in mills, coal mines and other places where the service is severe.

It is a fine grease for use in hot places, the heavier consistencies having a melting point of from 400° to 450° F.

This grease is made in six consistencies known as No. 1, No. 2, No. 3, No. 4, No. 5 and No. 6. All sell at the folowing prices F. O. B. our factory:

Barrels . .	containing about 380 ℔s.	@ 12c per ℔.
Half bbls.	" " 225 ℔s.	@ 13c per ℔.
Kegs	" " 110 ℔s.	@ 14c per ℔.
50 ℔. cans		@ 15c per ℔.
25 ℔. cans		@ 16c per ℔.
10 ℔. cans		@ 17c per ℔.

Liberal samples on request.

Ohio Journal Grease

A superior mineral lubricant for Mine Cars, Electric Cars and Railway Cars. Also for ball and roller bearing axles or journals of all kinds; trolley wheels, elevator worm wells, etc.

It does not become rancid with age, gum, or leave a deposit of any kind. Its exceptional lubricating and lasting qualities enable our customers to get much better lubrication at an enormous reduction on the cost of oil, and on the labor of applying it.

It is made in two colors, called Light and Dark, and there are three consistencies of each color. These are designated by the letters A, B, C; A being the thinnest in each case. All are sold at the following prices F. O. B. our factory:

Barrels . .	containing about 380 ℔s.	@ 10c per ℔.
Half bbls.	" " 225 ℔s.	@ 11c per ℔.
Kegs	" " 110 ℔s.	@ 12c per ℔.

Not sold in smaller packages.

Liberal samples on request.

Ohio Rope Grease

A high grade lubricant for wire ropes or cables. Especially adapted for use on hoisting and haulage ropes. It is made of the best obtainable materials including Pennsylvania oil and finely powdered lubricating graphite. It contains no soda, lime, potash or soap, and therefore successfully resists the action of mineralized mine water.

It works its way right in to the center of each strand, thoroughly lubricates every wire, eliminates internal friction and prevents rusting. This, of course, materially prolongs the life of the rope, thus effecting great economy.

It is sold at the following prices F. O. B. factory:

Barrels	containing about 380 ℔s.	@ 8c per ℔.
Half bbls.	" " 225 ℔s.	@ 9c per ℔.
Kegs	" " 110 ℔s.	@ 10c per ℔.
50 ℔. cans		@ 11c per ℔.
25 ℔. cans		@ 12c per ℔.

Not sold in smaller packages.

Liberal samples on request.

Ohio Gear Grease

A first class lubricant for exposed gears, not running in cases or housings. It is not effected by the weather, and will not wash off. Neither will it harden and fill up the meshes, or get brittle, crack and drop off. It simply stays where it is put, and does good work under all conditions. Made in three consistencies, and sells at the same prices as Rope Grease.

NEW YORK & NEW JERSEY LUBRICANT CO.

Originators and Sole Manufacturers

TRADE MARK REGISTERED IN
NON-FLUID OIL
UNITED STATES PATENT OFFICE

165 Broadway New York

Products

Non-Fluid Oil—produced in over forty densities, including grades exactly suited to every lubricating condition that is presented in the operation of coal mining and handling machinery.

MoToRoL—For lubricating cylinders of gas engines.

Non-Fluid Mine Car Oil

Medium Grade for **Plain Cavity Type Wheels**

Is of such consistency that it will feed properly from the oil chamber to the axle under all service conditions. This guards against the excessive friction-load and destructive wear that occur when using car oils, which congeal in winter, or car wheel greases, for these cannot start to lubricate until the heat of the bearing renders them soft enough to flow from the reservoir. On the other hand, Non-Fluid Mine Car Oil is not so light that it will escape from the bearings, and only sufficient lubricant feeds from the reservoir to replace that which is actually worn out. The agitation of the lubricant, caused by the jerking and jarring of the cars in running over rail joints and in taking up slack in the car couplings, facilitates this feeding process. The waste in using car oil is very great, particularly during hot weather, as it pours in a continuous stream from the reservoir to the axle, and is literally "pumped" from the bearing, because of the lost motion between the wheel and the axle.

Non-Fluid Mine Car Oil

Heavy Grade for **Roller Bearing Type Wheels**

Uniformly maintains a consistency about equal to that of warm vaseline, and can be depended on to keep all the rubbing parts coated with a lubricant film that minimizes frictional resistance and promotes the efficiency of roller bearings in their function of reducing power consumption. Fluid oils fail to render this service, because of their tendency to flow away from frictional points. This fault is aggravated as the bearings warm up, for then the oil is rapidly vaporized and actual metal-to-metal contact takes place over large areas of the bearing surface, resulting in an abnormally high friction-load and rapid wear of the bearings. The constant escaping of oil from the bearings also makes it very wasteful, and necessitates frequent recharging of the oil chamber.

The use of ordinary grease in Roller Bearings should be avoided, because, as is well known, grease must be melted by the heat of the bearing before it can lubricate at all. Since this necessitates an increase in the friction load, it follows that grease in a measure defeats the very object for which roller bearings are installed and is therefore unsuitable for their lubrication. So-called "semi-fluid" or "semi-solid" greases as a rule liquefy in use, and waste as freely as oils, while failing to provide relief from the drawbacks of ordinary grease.

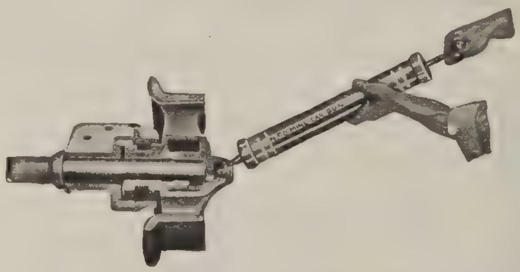
Non-Fluid Mine Car oil is a strictly neutral lubricant and will preserve the finely finished surfaces of the rollers, guarding against the corrosion and pitting that generally occur when ordinary greases are employed, due to the presence of free acid in the lubricant.

If an even heavier density is preferred, Grade No. 120 is recommended. For **car wheels equipped with Hyatt Roller Bearings** the **light** grade is generally most suitable, although the construction of some makes of wheels, equipped with these bearings, will permit the use of the heavier grades.

When using Non-Fluid Mine Car Oils, all wheels should be fitted with oil plugs.

N. F. O. Mine Car Gun

This gun is designed especially for applying Non-Fluid Mine Car Oils, and will handle all grades with ease, without the removal of spout, making it possible to pack car wheels quickly and without waste of lubricant.



It is of very substantial steel construction and will stand the roughest use. The barrel is 18½" x 2½" and the spout of gun tapers, so that it will fit any oil-hole.

Other Grades of Non-Fluid Oil

are of equally high efficiency for the lubrication of air compressors, box car loaders, car hauls, dynamos, engines, fans, gears, loading booms, mine locomotives, motors, picking tables, pumps, retarding conveyors, revolving dumps, shaker screens, sheaves, wire cables, etc.

Non-Fluid Oil definitely reduces the friction-load of machinery as compared with ordinary grease, and permits the utilization in useful work of a large percentage of power that is generally wasted.

Non-Fluid Oil outlasts the best fluid oils and greases three to five times, reducing the cost of lubrication and the labor and loss of time in oiling.

Non-Fluid Oil does not vary in consistency with changes of temperature, so can be depended on to lubricate efficiently under all service conditions.

LIBERAL TESTING SAMPLES WILL BE FURNISHED FREE, UPON REQUEST.

The results of our thorough research into the lubrication of coal mining machinery, have been embodied in our Bulletin 26A. Write for free copy.

KEYSTONE
THE.
MINING
CATALOG
COMBINED WITH
COAL FIELD
DIRECTORY
CONSOLIDATED PUBLISHING
COMPANY INC.

VENTILATING SECTION

Engineering Data

Ventilating Formulae.
Water Gauge Chart.
Humidity of Air measured by the Hygrometer.
Humidity Table.
Information or Specification Data.
Orifice Water Gauges.
Air Power Chart.
Mine Resistance Tables.
Air Friction in Circular Shafts.

The following manufacturers have catalogue descriptions in this section:

American Blower Co.
Connellsville Mfg. & Mine Supply Co.
Cutler-Hammer Mfg. Co.
Dodge Sales & Engineering Co.
Fulton Bag & Cotton Mills.
General Electric Co.
Goodin-Reid Co.
Jeffrey Mfg. Co.
Johnston, Morehouse & Dickey Co.
Link-Belt Co.
Robinson Ventilating Co.
Turner, Laurin H. Co.
Vulcan Iron Works.

For additional descriptions of Ventilating Equipment not appearing in this section refer to Index of Products in front of the book.

Information Needed When Ordering Mine Fans

Inquiries, or requests for estimates, should, so far as possible, contain the following information:

1. The maximum volume of air required.
2. Against what water gauge will it be delivered.
3. The type of fan required, whether Blowing, Exhaust, Blowing Reversible, or Exhaust Reversible.
4. Whether the fan is to be driven by an engine or motor, and if by the former, give steam pressure and approximate length of steam line; if driven by a motor, state whether the current is direct or alternating, and give voltage phase and number of alternations.
5. Whether the airway is a shaft or a drift. If the former, give dimensions inside of timbers at its top, and it the latter, give sectional dimensions at entrance.
6. Whether the mine is new or old, and if it is old, give the volume of air now obtained, and water gauge.
7. Whether the drive is to be placed on right or left-hand side of the fan facing the mine.
8. Whether you prefer a double or single intake fan.
9. Whether quotations on complete equipment or on fan alone, without engine or motor are required.

Drawing showing the general layout of your mine, location of fan and any other information which might assist in determining the fan best adapted to your special requirements.

Ventilating Formulae

The information contained in the following formulae will be found convenient for reference by mine engineers and operators who have ventilating problems under consideration:

I. The volume of air delivered by a mine ventilating fan varies directly as the number of revolutions. That is, a fan running 80 R. P. M. delivers 100,000 cubic feet. How much air will this fan deliver at 160? Solving the proportion: $80 : 160 :: 100{,}000 : X$, we have $X = 200{,}000$ cubic feet.

II. The water gauge or pressure produced by a fan varies directly as the square of the speed. If a fan is running 80 R. P. M. and produces 1" water gauge, what pressure will it produce at 160 R. P. M.? Stating the proportion thus: $(80)^2 : (160)^2 :: 1'' : X$, we have $X = 4''$ water gauge.

III. The water gauge or pressure required to force air through a mine varies directly as the square of volumes. If a mine is passing 100,000 cubic feet at one inch gauge, what pressure will be required to pass 200,000 cubic feet? From the following proportion: $(100{,}000)^2 : (200{,}000)^2 :: 1 : X$, we have $X = 4''$ water gauge.

IV. The power required to drive a fan varies directly as the cube of the number of revolutions. If a fan is running 80 R. P. M. and requires 25 H. P. to drive it, what power will be required to drive the fan at 160 R. P. M.? Stating the proportion thus: $(80)^3 : (160)^3 :: 25 : X$, we have $X = 200$ H. P.

V. The power required to ventilate a mine varies as the cube of the volumes of air passing. If it requires 25 H. P. to circulate 100,000 cubic feet of air through a mine, what H. P. will be required to pass 200,000 cubic feet? Solving the proportion: $(100{,}000)^3 : (200.000)^3 :: 25 \cdot X$, we have $X = 200$ H. P.

VI. To find the actual H. P. in air delivered by a ventilating fan: Multiply the number of cubic feet of air delivered per minute by the water gauge and divide the product by 6345. If a fan is delivering 100,000 cubic feet against 2" water gauge, what is the actual H. P output of the fan? Solution: $\frac{100.000 \times 2''}{6345} = 31.5$ H. P.

VII. To find the size of motor or engine required to drive a fan under average mine conditions: Multiply the number of cubic feet of air by the water gauge and divide this product by 4500. If a fan is delivering 100,000 cubic feet of air at 2" water gauge, what size motor or engine will be required to drive it? Solution: $\frac{100{,}000 \times 2''}{4500} = 44.4$ H. P

VIII. The indicated horse power of an engine is found from the following formula:

$$\frac{P\text{-}L\text{-}A\text{-}N}{33000}$$

Where P = Mean effective pressure.
L = Length of stroke in feet.
A = Area of piston in sq. inches.
N = Number of revolutions multiplied by 2.

Example: If a 16" x 18" engine is running 150 R. P. M. and the mean effective pressure is found by the indicator to be 40 lbs., what is the H. P.? Substituting in above formula: $\frac{40 \text{ lbs.} \times 1\frac{1}{2} \times 201 \times 300}{33000} = 109.6$ H. P

IX. The electrical H. P. consumed by direct current motor is found from the following formula:

$$\frac{V \times A}{746}$$

Where V = Volts.
A = Amperes.
746 = Number of watts in one H. P.

Example: A direct current motor is using 250 volts, 100 amperes, what is the H. P. consumed? Substituting in above: $\frac{250 \times 100}{746} = 33.5$ H. P.

X. The mechanical efficiency of a ventilating equipment is the ratio of the actual H. P. output to the actual H. P. input. In example VI the actual H. P. output is 31.5, and in example VII the actual H. P. input is 44.4; and dividing the output by the input, we have $31.5 \div 44.4 = 71\%$ mechanical efficiency of equipment.

XI. The theoretical water gauge of a fan is computed from the following formula:

$$\frac{V^2 \text{ x } .078}{32.2 \times 5.2}$$

Where V = peripheral speed of fan in feet per sec.
32.2 = g. acceleration due to gravity.
.078 = weight of cubic foot of air.
5.2 = pressure per square foot for 1" water gauge.

If a fan is running at 80⅓ feet peripheral speed per second, we have $\frac{(80\frac{1}{3})^2 \times .078}{32.2 \text{ x} \times 5.2} = 3''$ theoretical gauge.

XII. Manometric efficiency is the ratio of the theoretical water gauge to the actual water gauge developed by a fan. If a fan running at a peripheral speed of 4820 feet per minute (80⅓ feet per second) produces an actual water gauge of 2", what is its manometric efficiency? We find by example XII the theoretical gauge is 3", and dividing the actual gauge by the theoretical gauge, we have $2'' \div 3'' = 66\frac{2}{3}\%$ manometric efficiency.

XIII. Volumetric capacity of a fan is the ratio of the actual volume produced to the cubical contents of the fan multiplied by number of revolutions. The cubical contents of a fan 10' diameter, 5' wide, is 392 cubic feet, and running at 100 R. P. M. = 39,200. If we find the actual volume delivered by the fan to be 78,400, we have $78{,}400 \div 39{,}200 = 200\%$ volumetric capacity.

XIV. The pressure or water gauge required to force air through a mine may be obtained by multiplying the total rubbing surface by the square of velocity of air and a co-efficient of friction (.000,000,005), and dividing the product by 5.2 times the sectional area.

A mine has 208,000 square feet rubbing surface, a sectional area of 100 square feet and 100,000 cubic feet of air is required per minute, what is the water gauge?

Solution: $\frac{208{,}000 \times (1{,}000)^2 \times .000{,}000{,}005}{100 \times 5.2} = 2''$

Note.—The co-efficient of friction may vary in ratio of from 1 to 7 on different mines, and it is a very uncertain quantity.

Every precaution should be taken to keep large airways, and it is best to assume that no mine should be permitted to get into a condition requiring over three inches water gauge pressure to ventilate it on every day duty.

Courtesy Jeffrey M'f'g Co.

Humidity of Mine Air Measured by The Hygrometer

What the Wet-and-Dry-Bulb Hygrometer Indicates—

The wet-and-dry-bulb hygrometer shows the difference between the readings of the two thermometers. The dry-bulb thermometer, of course, indicates the actual temperature of the air. The reading of the wet-bulb thermometer is lowered by the evaporation of the water from the little sack surrounding this bulb, and which is kept mois tby the water drawn up through the wick from the vessel below.

The difference of temperature indicated by these two thermometers depends on the rapidity of the evaporation of the water from the wet bulb. The evaporation is more rapid in dry than in wet air; and the difference of reading is, thus, an index or measure of the degree of saturation of the air. When the air is fully saturated with moisture there is no evaporation from the wet bulb and the readings of the two thermometers are the same. The difference increases with the dryness of the air.

Difference Between Dry and Wet Bulb

Reading of dry bulb ther.	Degrees																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	17.5	18	18.5	19	19.5	20	20.5	21
Degrees	Relative Humidity																								
65	95	90	85	80	75	70	66	62	57	53	48	44	40	36	32	28	25	23	21	19	17	15	13	12	10
66	95	90	85	80	76	71	66	62	58	53	49	45	41	37	33	29	26	24	22	20	18	17	15	13	11
67	95	90	85	80	76	71	67	62	58	54	50	46	42	38	34	30	27	25	23	21	20	18	16	15	13
68	95	90	85	81	76	72	67	63	59	55	51	47	43	39	35	31	28	26	24	23	21	19	17	16	14
69	95	90	86	81	77	72	68	64	59	55	51	47	44	40	36	32	29	27	25	24	22	20	19	17	15
70	95	90	86	81	77	72	68	64	60	56	52	48	44	40	37	33	30	28	26	25	23	21	20	18	17
71	95	90	86	82	77	73	69	64	60	56	53	49	45	41	38	34	31	29	27	26	24	22	21	19	18
72	95	91	86	82	78	73	69	65	61	57	53	49	46	42	39	35	32	30	28	27	25	23	22	20	19
73	95	91	86	82	78	73	69	65	61	58	54	50	46	43	40	36	33	31	29	28	26	24	23	21	20
74	95	91	86	82	78	74	70	66	62	58	54	51	47	44	40	37	34	32	30	29	27	25	24	22	21
75	96	91	87	82	78	74	70	66	63	59	55	51	48	44	41	38	34	33	31	30	28	26	25	23	22
76	96	91	87	83	78	74	70	67	63	59	55	52	48	45	42	38	35	34	32	30	29	27	26	24	23
77	96	91	87	83	79	75	71	67	63	60	56	52	49	46	42	39	36	34	33	31	30	28	27	25	24

Relative Humidity of Air

As previously explained the relative humidity of air is expressed by the ratio of the actual vapor pressure in the air at the time, to the saturated vapor pressure. The following table gives the percentage of saturation or the hygrometric state of air for various differences of readings, at different temperatures.

To use the table, find the observed temperature of the air, in the left-hand column, and the difference of the observed readings of the wet-and-dry-bulb thermometers, at the top of the table; the corresponding number in the table is the percentage of saturation which expresses the degree of humidity of the air. For example, if the dry-bulb temperature is 70 deg. and the wet-bulb 64 deg. F. the difference of readings is 6 deg. and the corresponding humidity as taken from the above table is 72 per cent.

The Application to Mining

The moisture which air can carry varies directly with its temperature, that is, air at 80 deg. F. can carry more moisture than air at 20 deg. F. Let us assume the average temperature of mine air to be 60 deg. F. the whole year around. During the warm summer months air entering the mine at 80 deg. F. comes in contact with the top and sides of the entry and is cooled to the temperature of the mine. Because of the drop of 20 degrees in temperature, the quantity of water vapor the air can carry is reduced and moisture may be deposited on the top and sides, on the same principle as dew is deposited on blades of grass during the warm summer nights. The mine is then said to be "on a sweat." If the warm air entering the mine is at a low humidity, that is, it is carrying but a small percentage of water vapor, the effect of a drop of 20 degrees in temperature may be merely to raise the humidity of the air, but not, however, to the dew point. In this event no moisture will be deposited.

In the winter months the conditions are reversed. Air entering the mine, say at 20 deg. F., gradually reaches a temperature equal to that of the mine. With each increment in temperature given to the air its capacity for moisture is increased, and this moisture is supplied as the air passes over the wet sections of the mine. The effect is to make these sections dry, thereby increasing the danger from the fine coal dust, which, when free from moisture, rises into the air current and finds lodgment on the timbers and irregular surfaces of the coal. For this reason it is advocated that in all mines which are dry and dusty moisture be supplied to the mine during the cold months by means of exhaust steam, sprays, sprinkling with a hose or by a pump mounted on a moveable truck and forcing the water through pipes or sprays under pressure.

Ventilating Formula

The weight of 1 cu. ft. of Air, at any temperature T, Fahr., and any barometric pressure B & relative humidity H, is calculated by the formula

$$W = \frac{1.3273\ (B-0.3765\ P\ H)}{460 + T}$$

in which P is the vapor pressure in inches of mercury, fo the observed temperature T, as given by Steam-Tables.

The velocity V of Air, in feet per minute, due to any gage G in inches is then calculated by the formula

$$V = 1097 \sqrt{\frac{G D}{W}} = 952.5 \sqrt{\frac{(460 + T) \quad G\ D}{B-0.3765\ P\ H}}$$

in which D is the density or specific gravity of the liquid used in the Manometer, referred to water as unity.

Example:- Find the velocity of an air current when the water gage is 1 inch (G = 1), the temperature of the Air being 70° F., the relative humidity 50% and the barometric pressure 30 inches.

Solution:- The vapor pressure, as taken from Steam Tables, for a temperature of 70° F., is 0.739 in. for water gage, D = 1, which gives

$$V = 952.5 \sqrt{\frac{(460 + 70) \quad 1 \times 1}{30-0.3765 \times 0.739 \times 0.50}} = 4013 \text{ ft. per min.}$$

Courtesy Davis Instrument & Mfg. Co

MINE RESISTANCE

Courtesy W. A. Rowe and Thos. W. Fitch, Jr.

American Blower Co.

The resistance to the flow of air through any given mine, or water guage, is a product of so many different factors that it would be difficult to give in a condensed form sufficient information to cover all the various considerations which would have to be borne in mind to arrive at anything like correct results.

Among the various factors might be mentioned the resistance due to regulators, turns, sudden changes of area in airways, etc. The most important factor of all, and that to which the following subject matter will apply, is the frictional resistance offered to the air due to its rubbing on sides, top, and bottom of airways and entries, and the following tables are given to enable one to approximate what might be expected in airways of various heights and widths.

In determining these quantities we have used the formula Friction in inches water guage=K. S. V^2
5.2 A

Where S=rubbing surface in square ft.
V=velocity of air current in feet per minute.
A=area of airway in square feet.
K=.000,000,007,3.

This value of the coefficient K has been determined from various sources from experiments by engineers in this country and applies to the conditions for which these tables are made up, namely, for air passages which are untimbered, fairly smooth, straight, unobstructed, and regular in size.

For other conditions of airways a table of correction factors is given, the results from which will be found fairly accurate in actual practice.

Due allowance should be made in the case of turns, and for sudden expansions or contractions in the airways, where a considerable velocity is maintained, by adding an equivalent length of straight airway to the actual length as determined from the plans.

There is also another element to be taken into consideration in cases where the velocity of the air entering the mine is high, say above 1000′ per minute. In such cases the pressure (or vacuum) necessary to cause this initial velocity should be added to the frictional resistance of the mine. The quantities to be added are given in the following table.

For the sake of convenience the air friction in the mine airways has been based on an airway 1000′ long and proportionate amounts should be taken for airways of lesser or greater length. Where quantities less or greater than the amounts covered by the following tables are encountered it will be necessary to exterpolate, bearing in mind that the fractional resistance for a given size airway is proportioned to the square of the velocity or capacity.

A table is also given covering the resistance of circular shafts for various diameters and velocities, which is subject to the same correnctions for different conditions as is the case in the friction charts for airways. For shafts of square or rectangular shape, the tables for airways may be used.

AIR FRICTION IN MINE AIRWAYS.

TABLE OF VOLUMES OF AIR WHICH WILL FLOW THROUGH GIVEN SIZES OF AIRWAY AT GIVEN VELOCITIES AND THE RESISTANCE IN INCHES OF WATER-GAUGE WHICH WILL BE OFFERED BY 1,000 FT. LENGTH OF AIRWAY.

HEIGHT AIRWAY		4																			
WIDTH "		4'		5'		6'		7'		8'		9'		10'		11'		12'		13'	
AREA "		16'		20'		24'		28'		32'		36'		40'		44'		48'		52'	
PERIMETER "		16'		18'		20'		22'		24'		26'		28'		30'		32'		34'	
VELOCITY.																					
PER SEC	PER MINUTE	VOL.	W.G.	VOL.	W.G.	VOL.	W.G.	VOL.	W.G.	VOL.	W.G.	VOL.	W.G.	VOL.	W.G.	VOL.	W.G.	VOL.	W.G.	VOL.	W.G.
5	300	4800	.18	6000	.11	7200	71	8400	.10	9600	.09	10800	.09	12000	.09	13200	.09	14400	.08	15600	.08
6	360	5760	.17	7200	.16	8640	16	10080	.14	11520	.14	12960	.13	14400	.13	15940	.12	17280	.12	18720	.12
7	420	6720	.25	8400	.22	10080	.21	11760	.19	13440	.19	15120	.18	16800	.17	18480	.17	20160	.17	21840	.16
8	480	7680	.32	9600	.29	11.520	.27	13440	.25	15360	.24	17280	.23	19200	.23	21120	.22	23040	.22	24960	.21
9	540	8640	.41	10800	.37	12960	.34	15120	.32	17280	.31	19440	.29	21600	.29	23760	.28	25920	.27	28080	.27
10	600	9600	.50	12000	.46	14400	.42	16800	.40	19200	.38	21600	.36	24000	.35	26400	.34	28800	.34	31200	.33
12	720	11520	.73	14400	66	17280	.60	20160	.57	23040	.54	25920	.52	28800	.51	31680	.49	34560	.48	37440	.47
14	840	13440	99	16800	.89	20160	.82	23520	.78	26880	.74	30240	.71	33600	.69	36960	67	40320	.66	43680	.65
16	960	15360	1.29	19200	1.16	23040	1.08	26880	1.01	30720	.97	34560	93	38400	.90	42240	.88	46080	.86	49920	.84
18	1080	17280	1.63	21600	1.47	25920	1.36	30240	1.28	34560	1.22	38880	1.18	43200	1.14	47520	1 11	51840	1.09	56160	1.07
20	1200	19200	2 02	24000	1.81	28800	1.68	33600	1.58	.38400	1.51	43200	1.46	48000	1.41	52800	1.37	57600	1.34	62400	1.32
22	1320	21120	2 44	26400	2.20	31680	2.03	36960	1.92	42240	1.83	47520	1.76	52800	1.71	58080	1 66	63360	1.62	68640	1.60
24	1440	23040	2.90	28800	2.61	34560	2.42	40320	2.28	46080	2.18	51840	2.10	57600	2.03	63360	1.98	69120	1.94	74880	1.89
26	1560	24960	3.41	31200	3 07	37440	2.84	43680	2.68	49920	2.56	56160	2.46	62400	2.38	68640	2.32	74880	2.27	81120	2.23
28	1680	26880	3.95	33600	3.66	40320	3.29	47040	3.10	53760	2.96	60480	2.85	67200	2.77	73920	2.69	80640	2.63	87360	2.59
30	1800	28800	4.54	36000	4.08	43200	3.78	50400	3.56	57600	3.40	64800	3 28	72000	3.18	79200	3.09	86400	3.02	93600	2.96

AIR FRICTION IN MINE AIRWAYS.

TABLE OF VOLUMES OF AIR WHICH WILL FLOW THROUGH GIVEN SIZES OF AIRWAYS AT GIVEN VELOCITIES AND RESISTANCE IN INCHES OF WATER-GAUGE WHICH WILL BE OFFERED BY 1,000 FT. LENGTH OF AIRWAY.

HEIGHT AIRWAY		5'																			
WIDTH "		5'		6'		7'		8'		9'		10'		11'		12'		13'		14'	
AREA "		25'		30'		35'		40'		45'		50'		55'		60'		65'		70'	
PERIMETER "		20'		22'		24'		26'		28'		30'		32'		34'		36'		38'	
VELOCITY.																					
PER SEC.	PER MINUTE	VOL.	W.C.	VOL.	W.C.	VOL.	W.C.	VOL.	W.C.	VOL.	W.C.	VOL.	W.C.	VOL.	W.C.	VOL.	W.C.	VOL.	W.C.	VOL.	W.C.
5	300	7500	.10	9000	.09	10500	.09	12000	.08	13500	.08	15000	.08	16500	.07	18000	.07	19500	.07	21000	.07
6	360	9000	.16	10800	.13	12600	.12	14400	.12	16200	.11	18000	.11	19800	.11	21600	.10	23400	.10	25200	.09
7	420	10500	.20	12600	.18	14700	.17	16800	.16	18900	.15	21000	.15	23100	.14	25200	.14	27300	.14	29400	.13
8	480	12000	.26	14400	.24	16800	.22	19200	.21	21600	.20	24000	.19	26400	.19	28800	.18	31200	.18	33600	.17
9	540	13500	.33	16200	.30	18900	.28	21600	.27	24300	.25	27000	.24	29700	.24	32400	.23	35100	.23	37800	.21
10	600	15000	.40	18000	.37	21000	.35	24000	.33	27000	.31	30000	.30	33000	.29	36000	.29	39000	.28	42000	.26
12	720	18000	.58	21600	.53	25200	.50	28800	.47	32400	.45	36000	.44	39600	.42	43200	.41	46800	.40	50400	.38
14	840	21000	.79	25200	.72	29400	.68	33600	.64	37800	.61	42000	.59	46200	.57	50400	.56	54600	.55	58800	.52
16	960	24000	1.03	28800	.95	33600	.88	38400	.84	43200	.80	48000	.77	52800	.75	57600	.73	62400	.71	67200	.67
18	1080	27000	1.31	32400	1.20	37800	1.12	43200	1.06	48600	1.02	54000	.98	59400	.96	64800	.93	70200	.90	75600	.85
20	1200	30000	1.61	36000	1.48	42000	1.38	48000	1.31	54000	1.25	60000	1.21	66000	1.17	72000	1.14	78000	1.11	84000	1.05
22	1320	33000	1.95	39600	1.79	46200	1.67	52800	1.59	59400	1.62	66000	1.46	72600	1.42	79200	1.39	85800	1.35	92400	1.27
24	1440	36000	2.32	43200	2.13	50400	1.99	57600	1.88	64800	1.81	72000	1.74	79200	1.69	86400	1.65	93600	1.60	100800	1.52
26	1560	39000	2.71	46800	2.50	54600	2.34	62400	2.21	70200	2.12	78000	2.04	85800	1.98	93600	1.93	101400	1.88	109200	1.78
28	1680	42000	3.23	50400	2.90	58800	2.71	67200	2.57	75600	2.46	84000	2.37	92400	2.29	100800	2.24	109200	2.18	117600	2.06
30	1800	45000	3.69	54000	3.33	63000	3.11	72000	2.94	81000	2.82	90000	2.72	99000	2.64	108000	2.57	117000	2.51	126000	2.37
32	1920	48000	4.13	57600	3.78	67200	3.54	76800	3.35	86400	3.21	96000	9.10	105600	3.00	115200	2.93	124800	2.85	134400	2.70
34	2040	51000	4.66	61200	4.27	71400	4.00	81600	3.79	91800	3.63	102000	3.50	112200	3.39	122400	3.31	132600	3.22	142800	3.04

HEIGHT AIRWAY		6'																			
WIDTH "		6'		7'		8'		9'		10'		11'		12'		13'		14'		15'	
AREA "		36'		42'		48'		54'		60'		66'		72'		78'		84'		90'	
PERIMETER "		24'		26'		28'		30'		32'		34'		36'		38'		40'		42'	
VELOCITY.																					
PER SEC.	PER MINUTE	VOL.	W.C.	VOL.	W.C.	VOL.	W.C.	VOL.	W.C.	VOL.	W.C.	VOL.	W.C.	VOL.	W.C.	VOL.	W.C.	VOL.	W.C.	VOL.	W.C.
5	300	10800	.08	12600	.08	14400	.07	16200	.07	18000	07	19800	.06	21600	.06	23400	.06	25200	.06	27000	.06
6	360	12960	.12	15120	.11	17280	.11	19440	.10	21600	.10	23760	.09	25920	.09	28080	.09	30240	.09	32400	.08
7	420	15120	.16	17640	.15	20160	.14	22680	.14	25200	.13	27720	.13	30240	.12	32760	.12	35280	.12	37800	.12
8	480	17280	.22	20160	.20	23040	.19	25920	.18	28800	.17	31680	.17	34560	.16	37440	.16	40320	.15	43200	.15
9	540	19440	.27	22680	.25	25920	.24	29160	.22	32400	.22	35640	.21	38880	.20	42120	.20	45360	.19	48600	.19
10	600	21600	.34	25200	.31	28800	.29	32400	.28	36000	.27	39600	.26	43200	.25	46800	.25	50400	.24	54000	.24
12	720	25900	.48	30240	.45	34560	.42	38800	.40	43200	.39	47520	.37	51840	.36	56160	.35	60480	.35	64800	.34
14	840	30240	66	35280	.61	40320	.58	45360	.54	50400	.53	55440	.51	60480	.49	65520	.48	70560	.47	75600	.46
16	960	34560	86	40320	.80	46080	.75	51840	.71	57600	.69	63360	.67	69120	.65	74880	.63	80640	.62	86400	.60
18	1080	38880	1.09	45360	1.01	51840	.95	58320	.89	64800	.87	71280	.84	77760	.82	84240	.80	90720	.78	97200	.76
20	1200	43200	1.34	50400	1.25	57600	1.18	64800	1.12	72000	1.08	79200	1.04	86400	1.01	93600	.98	100800	.96	108000	.94
22	1320	47520	1.64	55440	1.51	63360	1.42	71280	1.34	79200	1.30	87120	1.26	95040	1.22	102960	1.19	110880	1.16	118800	1.14
24	1440	51840	1.94	60480	1.80	69120	1.69	77760	1.59	86400	1.55	95040	1.50	103680	1.45	112320	1.41	120960	1.38	129600	1.35
26	1560	56160	2.27	65520	2.11	74880	1.99	84240	1.87	93600	1.82	102960	1.76	112320	1.70	121680	1.66	131040	1.62	140400	1.59
28	1680	60480	2.63	70560	2.45	80640	2.30	90720	2.16	100800	2.11	110880	2.04	120960	1.98	131040	1.92	141120	1.88	151200	1.84
30	1800	64800	3.02	75600	2.81	86400	2.64	97200	2.48	108000	2.42	118800	2.34	129600	2.27	140400	2.21	151200	2.16	162000	2.12
32	1920	69120	3.44	80640	3.19	92160	3.01	103680	2.83	115200	2.75	126720	2.66	138240	2.58	149760	2.51	161280	2.46	172800	2.41
34	2040	73440	3.88	85680	3.61	97920	3.40	110160	3.19	122400	3.11	134640	3.00	146880	2.91	159120	2.84	171360	2.77	183600	2.72

VELOCITY PER SEC.	PER MINUTE	VOL.	W.C	VOL	W.C	VOL	W.C	VOL.	W.C	VOL.	W.C	VOL.	W.C	VOL.	W.C	VOL.	W.C	VOL.	W.C	VOL.	W.C
HEIGHT AIRWAY		7'																			
WIDTH "		7'		8'		9'		10'		11'		12'		13'		14'		15'		16'	
AREA "		49'		56'		63'		70'		77'		84'		91'		98'		105'		112'	
PERIMETER "		28'		30'		32		34'		36'		38'		40'		42'		44		46'	
5	300	14700	.07	16800	.07	18900	.06	21000	.06	23100	.06	25200	.06	27300	06	29400	.05	31500	.05	33600	.05
6	360	17640	.10	20160	.10	22680	.09	25200	.09	27720	.08	30240	.08	32760	.08	35280	.08	37800	08	40320	.07
7	420	20580	.14	23520	.13	26460	.13	29400	.12	32340	.12	35280	.11	38220	.11	41160	.11	44100	10	47040	.10
8	480	23520	.18	26880	.17	30240	.16	33600	.16	36960	.15	40320	.15	43680	.14	47040	.14	50400	14	53760	.13
9	540	26460	.23	30240	.22	34020	.21	87800	.20	41580	.19	45360	.18	49140	.18	52920	.17	56700	.17	60480	.17
10	600	29400	.29	33600	.27	37800	.26	42000	24	46200	.24	50400	.23	54600	22	58800	.22	63000	.21	67200	.21
12	720	35280	.41	40320	.39	45360	.37	50400	.35	55440	.34	60480	.33	65520	.32	70560	.31	75600	.30	80540	.30
14	840	41160	.56	47040	.53	52920	.50	58800	.48	64680	.46	70560	45	76440	.43	82320	.42	88200	.41	94080	41
16	960	47040	.74	53760	.69	60480	.66	67200	.63	73920	.60	80640	.58	87360	.57	94080	.55	100800	.54	107520	.53
18	1080	52920	93	60480	.87	68040	.83	75600	.79	83160	.76	90720	74	98280	.72	105840	.67	113400	68	120860	.67
20	1200	58800	1.15	67200	1.08	75600	1.02	84000	98	92400	94	100800	.91	109200	.88	117600	86	126000	.84	134400	.83
22	1320	64680	1.39	73920	1.31	83160	1.24	92400	1.18	101640	1.14	110880	1.10	120120	1.07	129360	1.05	138600	1.02	147840	1.00
24	1440	70560	1.66	80640	1.56	90720	1.47	100800	1.41	110880	1.36	120960	1.31	131040	1.27	141120	1.24	151200	1.22	161280	1.19
26	1560	76440	1.95	87360	1.83	98280	1.73	109200	1.65	120120	1.59	131040	1.54	141960	1.49	152880	1.46	163800	1.43	174720	1.40
28	1680	82320	2.26	94080	2.12	105840	2.01	117600	1.92	129360	1.85	141120	1.79	152880	1.73	164640	1.69	176400	1.66	188160	1.62
30	1800	88200	2.59	100800	2.43	113400	2.30	126000	2.20	138600	2.12	151200	2.05	163800	1.99	176400	1.94	189000	1.90	201600	1.86
32	1920	94080	2.95	107520	2.76	120960	2.62	134400	2.51	147840	2.41	161280	2.33	174720	2.26	188160	2.21	201600	2.16	215040	2.12
34	2040	99960	3.33	114240	3.12	128520	2.96	142800	2.83	157080	2.72	171360	2.64	185640	2.56	199920	2.50	214200	2.44	228480	2.39
36	2160	105840	3.73	120960	3.50	136080	3.32	151200	3.17	166320	3.07	181440	2.95	196560	2.87	211680	2.80	226800	2.74	241920	2.68
38	2280	111720	4.16	127680	3.90	143640	3.70	159600	3.53	175560	3.40	191520	3.29	207480	3.19	223440	3.11	239400	3.03	255360	2.99
40	2400	117600	4.61	134400	4.32	151200	4.10	168000	3.92	184800	3.77	201600	3.65	218400	3.54	236200	3.46	252000	3.38	268800	3.31

AIR FRICTION IN MINE AIRWAYS.

TABLE OF VOLUMES OF AIR WHICH WILL FLOW THROUGH GIVEN SIZES OF AIRWAYS AT GIVEN VELOCITIES AND RESISTANCE IN INCHES OF WATER-GAUGE WHICH WILL BE OFFERED BY 1,000 FT. LENGTH OF AIRWAY.

VELOCITY. PER SEC.	PER MINUTE	VOL.	W.G	VOL.	W.G.	VOL	W.G	VOL.	W.G	VOL.	W.G	VOL.	W.G.	VOL.	W.G.	VOL	W.G	VOL.	W.G.	VOL.	W.G.
HEIGHT AIRWAY		8'																			
WIDTH "		8		9'		10'		11'		12'		13'		14'		15'		16'		17'	
AREA "		64'		72'		80'		88'		96'		104'		112'		120'		128'		136'	
PERIMETER "		32'		34'		36'		38'		40'		42'		44'		46'		48'		50'	
5	300	19200	.06	21600	.06	24000	06	26400	.06	28800	.05	31200	05	33600	05	36000	.05	38400	05	40800	.05
6	360	23040	.09	25920	09	28800	08	3 680	08	34560	.08	37440	07	40320	07	43200	07	46080	07	48960	07
7	420	26880	12	30240	12	33600	11	36960	11	40320	.10	43680	10	47040	10	50400	.09	53760	09	57120	.09
8	480	30720	.16	34560	.15	38400	15	42240	14	46080	.13	49920	13	53760	13	57600	12	61440	12	65280	12
9	540	34560	.20	38880	19	43200	18	47520	18	51840	17	56160	16	60480	16	64800	16	69120	15	73440	.15
10	600	38400	25	43200	24	48000	.23	52800	22	57600	21	62400	.20	67200	20	72000	19	76800	19	81600	.19
12	720	46080	.36	57840	34	57600	33	63360	31	69120	29	74880	29	80640	29	86400	28	92160	27	97920	27
14	840	53760	.49	60480	47	67200	.44	73920	43	80640	41	87360	40	94080	39	100800	38	107520	37	114240	36
16	960	61440	.65	69120	61	76800	58	84480	56	92160	54	99840	.52	107520	51	115200	49	122880	.48	130560	.47
18	1080	69120	.82	77760	.77	86400	.73	95040	71	103680	.68	112320	66	120960	.64	129600	.63	138240	61	146880	60
20	1200	76800	1.01	86400	95	96000	91	105600	87	115200	84	124800	81	134400	79	144000	77	153600	76	163200	74
22	1320	84480	1.22	95040	1.15	105600	1.10	116160	1.05	126720	1.02	137280	97	147840	96	158400	94	168960	91	179520	90
24	1440	92160	1.45	103680	1.37	115200	1.31	126720	1.25	138240	1.21	149760	1.17	161280	1.14	172800	1.11	184320	1.09	195840	1.07
26	1560	99840	1.70	112320	1.61	124800	1.53	137280	1.47	149760	1.42	162240	1.37	174720	1.33	187200	1.31	199680	1.28	212160	1.25
28	1680	107520	1.98	120960	1.87	134400	1.78	147840	1.71	161280	1.65	174720	1.59	188160	1.50	201600	1.67	215040	1.48	228480	1.45
30	1800	115200	2.27	129600	2.14	144000	2.04	158400	1.96	172800	1.89	187200	1.83	201600	1.78	216000	1.74	230400	1.70	244800	1.67
32	1920	122880	2.58	138240	2.44	153600	2.32	168960	2.23	184320	2.15	199680	2.08	215040	2.08	230400	1.98	245760	1.94	261120	1.89
34	2040	130560	2.91	146880	2.76	163200	2.62	179520	2.52	195840	2.43	212160	2.35	228480	2.29	244800	2.23	261120	2.18	277440	2.14
36	2160	138240	3.27	155520	3.08	172800	2.94	190080	2.82	207360	2.72	224640	2.64	241920	2.61	259200	2.50	276480	2.45	293760	2.40
38	2280	145920	3.64	164160	3.44	182400	3.27	200640	3.14	218880	3.03	237120	2.94	255360	2.86	273600	2.79	291840	2.73	310080	2.67
40	2400	153600	4.03	172800	3.81	192000	3.63	211200	3.48	230400	3.36	249600	3.25	268800	3.17	288000	3.09	307200	3.02	326400	2.96

AIR FRICTION IN MINE AIRWAYS

TABLE OF VOLUMES OF AIR WHICH WILL FLOW THROUGH GIVEN SIZES OF AIRWAYS AT GIVEN VELOCITIES AND RESISTANCE IN INCHES OF WATER-GAUGE WHICH WILL BE OFFERED BY 1,000 FT. LENGTH OF AIRWAY.

HEIGHT AIRWAY		9																			
WIDTH		9'		10		11'		12'		13'		14'		15'		16'		17'		18'	
AREA		81'		90'		99'		108'		117'		126'		135'		144'		153'		162'	
PERIMETER		36'		38'		40'		42'		44'		46'		48'		50'		52'		54'	
VELOCITY PER SEC.	VELOCITY PER MINUTE.	VOL	W.G.	VOL	W.G.	VOL	W.C.	VOL	W.C.	VOL.	W.C.	VOL	W.G.	VOL.	W.G.	VOL.	W.C.	VOL.	W.C.	VOL	W.C.
5	300	24300	06	27000	05	29700	05	32400	05	35100	.05	37800	.05	40500	04	43200	04	45900	04	48600	04
6	360	29160	.08	32400	08	35640	07	38880	07	42120	07	45360	07	48600	06	51840	06	55080	06	58320	.06
7	420	34020	11	37800	10	41580	.10	45360	10	49140	09	52920	.09	56700	09	60480	09	64260	08	68040	08
8	480	38880	14	43200	14	47520	13	51840	13	56160	12	60480	.12	64800	11	69120	11	73440	11	77760	11
9	540	43740	18	48600	17	53460	16	58320	16	63180	15	68040	.15	72900	15	77760	.14	82620	14	87480	14
10	600	48600	.22	54000	21	59400	20	64800	20	70200	19	75600	18	81000	18	86400	.17	91800	17	97200	17
12	720	58320	32	64800	31	71280	29	77760	28	84240	27	90720	.27	97200	.26	103680	25	110160	25	116640	.24
14	840	68040	44	75600	42	83160	40	90720	.38	98280	37	105840	.36	113400	35	120960	34	128520	.34	136080	.33
16	960	77760	.57	86400	54	95040	52	103680	.50	112320	.49	120960	47	129600	46	138240	45	146880	44	155520	43
18	1080	87480	73	97700	.59	106920	.66	116640	63	126360	.61	136080	.60	145800	.58	1555 0	.57	165240	.55	174960	54
20	1200	97200	90	108000	.84	118800	.81	129600	.78	140400	.76	151200	.74	162000	.72	172800	70	183600	.68	194400	.67
22	1320	106920	1 08	118800	1.03	130680	.99	142560	95	154440	.92	166320	.89	178200	87	190080	80	201960	.83	213840	.81
24	1440	116640	1 29	129600	1 23	142660	1.17	155520	1 13	168480	1.09	181440	1 06	194400	1 03	207360	1 01	220320	99	233280	97
26	1560	126360	1 51	140400	1 44	154440	1 38	168480	1.32	182520	1 28	196560	1.24	210600	1 21	224640	1.18	238680	1.16	252720	1.14
28	1680	136080	1 76	151200	1 67	166320	1 60	181440	1 54	196560	1 49	211680	1 44	226800	1.40	241920	1 37	257040	1.34	272160	1 32
30	1800	145800	2 02	162000	1 91	178200	1.83	194400	1.76	210600	1 71	226800	1.66	243000	1 61	259200	1 57	275400	1.54	291600	1.51
32	1920	165520	2 29	172800	2 18	190080	2 09	207360	2.01	224640	1 94	241920	1.88	259200	1 83	276480	1 79	293760	1 75	311040	1 72
34	2040	166240	2 59	183600	2 46	201960	2 36	220320	2.27	238680	2 19	257040	2.13	275400	2 07	293760	2 02	312120	1 98	330480	1.94
36	2160	175960	2 90	194400	2 76	213840	2 64	233280	2 54	252720	2 46	272160	2.38	291600	2.32	311040	2 27	330480	2.22	349920	2 18
38	2280	184680	3 23	205200	3 07	225720	2 94	246240	2.83	266760	2.74	287280	2.66	307800	2.59	328320	2 53	348840	2.47	369360	2.42
40	2400	194400	3 58	216000	3 40	237600	3 25	259200	3.14	280800	3.03	302400	2.94	324000	2.86	345600	2.80	367200	2.74	388800	2.69
45	2700	218700	4 64	243000	4 31	267300	4 12	291600	3.97	315900	3 84	340200	3 73	364600	3 63	388800	3 54	413100	3.46	437400	3.40
50	3000	243000	5 60	270000	5.32	297000	5.09	324000	4.90	351000	4 74	378000	4.60	405000	4.48	432000	4.37	459000	4.28	486000	4.20

CORRECTIONS

Corrections for varing conditions of Airways.

Use ½ of Table Water Guage for Air passages which are concreted, wood lined or of exceptional smoothness, and untimbered, straight, regular, and free from obstruction.

Use full Table Water Guage for Air passages which are untimbered, fairly smooth, straight, unobstructed, and regular in size.

Use 1½ times Table Water Guage for Air passages which are untimbered and moderately crooked, irregular, obstructed, and rough.

Use 2 times Table Water Guage for Air passages which are timbered but otherwise fairly smooth, straight, regular, and free from obstruction.

Use 2½ times Table Water Guage for Air passages which are timbered and moderately crooked, irregular, obstructed, and rough.

Use 3 times Table Water Guage for Air passages which are timbered and very crooked, irregular, obstructed, and rough.

In cases of airways in extremely bad condition, the resistance may be greater than three times the Water Guages given in the table.

Air Power Chart

The chart shown on opposite page is arranged to indicate directly the actual horse power in a mine ventilating air of a predetermined volume and water gauge. Also to successively show the commercial rating of a motor or steam engine required for a source of power.

In the event of using a steam engine for power, the diameter of the engine cylinder required for a given piston speed may be read directly from the chart.

The calculations for cylinder diameters are based on a mean effective pressure of 50 pounds per sq. inch. For other mean pressures it will be necessary to interpolate.

As noted on chart, the assumption is made that the mechanical efficiency of the fan is approximately 62½%. This percentage may be taken at any figure however.

In general the chart is constructed with a water gauge scale along the lower edge, advancing from near the center of bottom border toward the left.

Above this scale is a group of converging lines, used to represent volumes of air in cubic feet, and a single inclined line passing through the common converging point. This line serves as a multiplier to obtain a proper figure for power under the assumed efficiency of 62½%.

The vertical line passing through the point of convergence is graduated to show rating of prime mover. The series of (heavy curved lines) curves to the right of horse power scale, represent piston speed in feet per minute. Extending to the right from the common converging point, along lower border is a scale reading diameter of engine cylinder and may be read in connection with horse power value and piston speeds.

The graduations used to represent cylinder diameters may also be used to designate length of stroke and when read in connection with the light (dot and dash) curved line, marked revolutions per minute, a continuation reading of stroke revolution from which piston speed may be read.

Care should be taken in taking such a reading to avoid confusing length of strokes and piston diameter.

In the upper left hand corner of chart there is a group of curved lines from which may be obtained a value for the mean effective pressure corresponding to any point of cut off for a range of initial pressures.

By the initial pressure is meant the steam pressure at engine or near it.

These values do not have any direct conection to the work done by the chart but serves as a ready means of arriving at a value for a mean effective pressure with which the charted results may be checked. The method of using chart may be readily understood by following the example line out on chart.

EXAMPLE—It is desired to know the horse power in a volume of 275,000 cubic feet moved against a pressure of 3½ inches of water gauge, the horse power of a suitable motor or engine to drive a fan having an efficiency of 62½% of the above capacity, also the diameter of cylinder of an engine, the piston speed of which is 500 ft. per minute. Mean effective pressure to be 50 pounds per sq. inch. Find the 3½ graduation in water gauge scale and read up to line marked 275,000 cubic ft. of air, thence to the right to scale reading actual horse power in air and read 152, thence up to the line marked multiplier, thence to the right to horse power rating scale and read 242 horse power.

Note—(This rating is based on a mean effective pressure of 50 pounds per sq. inch, should the pressure be more or less in connection with any problem it will be necessary to interpolate, for instance say the pressure is 40 pounds (M. E. P.) it would be necessary to add 20% to the horse power, reading, or use 290 instead of 242. If the M. E. P. is greater than 50 pounds the rating would be reduced).

Thence to the right to the heavy curved line designated as 500 ft. per min. piston speed, thence down to the cylinder diameter scale and read 20¼ inches diameter of cylinder.

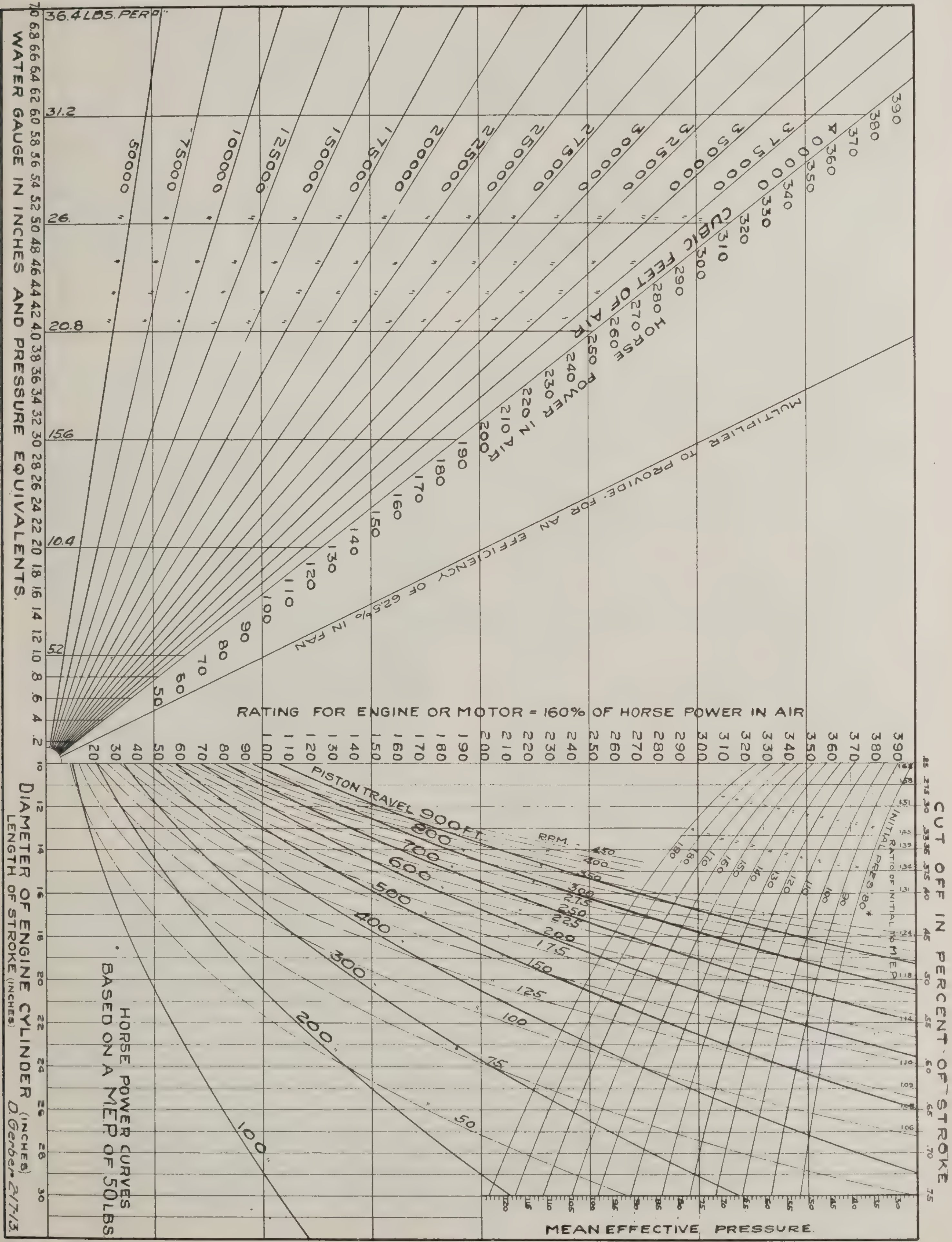
By reading up from the scale indicating the length of stroke in inches to the 500 feet piston speed the number of revolutions per minute of engine may be determined.

From the group of lines indicating mean effective pressures the percent of cut off required for a particular initial pressure may be arrived at. Suppose a mine superintendent has an engine of known diameter and stroke, he also knows approximately the steam pressure available and wishes to know the range of volume and pressure under which such motive power would be effective.

By assuming a rate for revolutions per minute, the stroke combined will give piston speed. The diameter combined with the piston speed will give the horse power for a mean effective pressure of 50 lbs. per sq. inch by interpolation this may be changed for any M. E. P.

The horse power once determined, it is only necessary to reverse the operation previously described and read the water gauge at which the determined horse power will deliver the various quantities of air.

Note—The scope of this chart does not take into account any features of the fan other than to assume that it operates with a mechanical efficiency of 62½%.


WATER GAUGE IN INCHES AND PRESSURE EQUIVALENTS.
36.4 LBS. PER □"
31.2
26.
20.8
15.6
10.4
5.2
7.0 6.8 6.6 6.4 6.2 6.0 5.8 5.6 5.4 5.2 5.0 4.8 4.6 4.4 4.2 4.0 3.8 3.6 3.4 3.2 3.0 2.8 2.6 2.4 2.2 2.0 1.8 1.6 1.4 1.2 1.0 .8 .6 .4 .2
CUBIC FEET OF AIR
50000
75000
100000
125000
150000
175000
200000
225000
250000
275000
300000
325000
350000
375000
400000
HORSE POWER IN AIR
MULTIPLIER TO PROVIDE FOR AN EFFICIENCY OF 62.5% IN FAN
RATING FOR ENGINE OR MOTOR = 160% OF HORSE POWER IN AIR
20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310 320 330 340 350 360 370 380 390
PISTON TRAVEL 900 FT.
800
700
600
500
400
300
200
100
R.P.M.
450
400
350
300
275
250
225
200
175
150
125
100
75
50
INITIAL RATIO OF INITIAL TO M.E.P.
PRES. 80
90 100 110 120 130 140 150 160 170 180
CUT OFF IN PERCENT OF STROKE
.25 .275 .30 .3335 .375 .40 .45 .50 .55 .60 .65 .70 .75
MEAN EFFECTIVE PRESSURE
DIAMETER OF ENGINE CYLINDER (INCHES)
LENGTH OF STROKE (INCHES)
10 12 14 16 18 20 22 24 26 28 30
HORSE POWER CURVES BASED ON A M.E.P. OF 50 LBS.
D. Gerber 2/7/13

ORIFICE WATER GAUGES

Initial Velocity Pressure (or Vacuum) in inches Water Gauge required to cause given volumes to flow into airways of given area.

Volume Cu. Ft. Per Min.	Area of Entry in Sq. Ft.																								
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	110	120	130	140	150
10,000	.37	.10																							
15,000	.84	.21	.10																						
20,000		.37	.16	.10																					
25,000		.58	.26	.15	.10																				
30,000		.84	.37	.21	.13	.10																			
35,000			.51	.28	.18	.13	.10																		
40,000			.66	.37	.24	.16	.12	.10																	
45,000			.84	.47	.30	.21	.16	.12	.10																
50,000				.58	.37	.26	.19	.15	.11	.10															
60,000				.84	.53	.37	.28	.21	.16	.13	.11	.10													
70,000					.71	.51	.37	.28	.23	.20	.15	.12	.11	.10											
80,000						.66	.49	.37	.29	.24	.20	.16	.14	.12	.11	.10									
90,000						.84	.62	.47	.37	.30	.25	.21	.18	.16	.13	.12	.11	.10							
100,000							.76	.59	.46	.37	.31	.26	.22	.19	.16	.14	.13	.12	.11	.10					
110,000							.92	.71	.56	.45	.37	.32	.27	.23	.20	.18	.16	.14	.13	.11	.10				
120,000								.84	.66	.54	.45	.37	.32	.28	.24	.21	.19	.16	.15	.13	.11	.10			
130,000								.99	.78	.63	.52	.44	.37	.32	.28	.25	.22	.20	.18	.16	.13	.11	.10		
140,000									.90	.73	.61	.51	.44	.37	.33	.28	.25	.22	.20	.19	.15	.13	.11	.10	
150,000										.83	.69	.59	.50	.43	.37	.33	.29	.26	.23	.21	.18	.10	.13	.11	.10
175,000											.95	.79	.67	.59	.51	.45	.40	.35	.32	.28	.24	.20	.17	.15	.12
200,000													.88	.76	.66	.59	.52	.46	.43	.37	.31	.26	.22	.19	.17
225,000															.84	.74	.65	.59	.53	.47	.39	.33	.28	.23	.21
250,000																.92	.82	.72	.65	.59	.49	.40	.33	.30	.26
275,000																		.87	.78	.70	.58	.49	.42	.36	.31
300,000																				.84	.69	.59	.50	.43	.37

AIR FRICTION IN CIRCULAR SHAFTS.

TABLE OF VOLUMES OF AIR WHICH WILL FLOW THROUGH GIVEN SIZES OF CIR AIR SHAFTS AT GIVEN VELOCITIES, AND RESISTANCE IN INCHES OF WATER-GAUGE WHICH WILL BE OFFERED BY 1,000 FT DEPTH OF SHAFT

DIA OF SHAFT		6'		7'		8'		9'		10'		12'		14'		16'		18'		20'	
AREA		28'		38'		50'		64'		79'		113'		154'		201		254'		314'	
PERIMETER		19'		22'		25'		28'		31		38'		44'		50		57'		63'	
VELOCITY		VOL.	W.G.	VOL.	W.G.	VOL.	W.G.	VOL.	W.G.	VOL	W.G.	VOL.	W.G.	VOL	W.G.	VOL	W.G.	VOL	W.G.	VOL	W.G.
PER SEC	PER MINUTE																				
10	600	16800	34	22800	29	30000	25	38400	.22	47400	20	67800	17	92400	14	120600	13	162400	11	188400	10
12	720	20160	.49	27360	42	36000	36	46080	32	56880	.28	81360	24	110880	21	144720	18	182880	.16	226080	15
14	840	23520	67	31920	.57	42000	49	53760	43	66360	39	94920	33	129360	28	168840	25	213360	22	263760	20
16	960	26880	88	36480	75	48000	65	61440	56	75840	51	108480	43	147840	.37	192960	32	243840	29	301440	26
18	1080	30240	1.11	41040	.95	54000	82	69120	71	86320	.64	122040	.56	166320	46	217080	41	274320	37	339120	33
20	1200	33600	1.37	45600	1.17	60000	1.01	76800	.88	94800	.79	135600	.68	184800	.58	241200	50	304800	45	376800	40
22	1320	36960	1.66	50160	1.41	66000	1.22	84480	1.07	104280	.96	149160	82	203280	70	265320	61	335280	55	414480	.49
24	1440	40320	1.98	54720	1.68	72000	1.45	92160	1.27	113760	1.14	162720	.98	221760	83	289440	72	365760	.65	452160	.58
26	1560	43680	2.31	59280	1.97	78000	1.70	99840	1.49	123240	1.34	176280	1.15	240240	97	313560	.86	396240	.76	489840	68
28	1680	47040	2.68	63840	2.28	84000	1.98	107520	1.73	132720	1.65	189840	1.33	258720	1.13	337680	.98	426720	.89	527520	79
30	1800	50400	3.08	68400	2.63	90000	2.27	115200	1.98	142200	1.78	203400	1.58	277200	1.30	361800	1.13	457200	1.02	565200	.91
32	1920	53760	3.50	72960	2.99	96000	2.58	122880	2.26	151680	2.02	216960	1.74	295680	1.47	385920	1.28	487680	1.16	602880	1.04
34	2040	57120	3.95	77520	3.37	102000	2.91	130560	2.55	161160	2.29	230520	1.96	314160	1.66	410040	1.45	518160	1.31	640560	1.17
36	2160	60480	4.43	82080	3.78	108000	3.27	138240	2.86	170640	2.56	244080	2.20	332640	1.87	434160	1.62	548640	1.47	678240	1.31
38	2280	63840	4.94	86640	4.21	114000	3.64	145920	3.18	180120	2.86	257640	2.45	351120	2.08	458280	1.81	579120	1.63	715920	1.46
40	2400	67200	5.47	91200	4.67	120000	4.03	153600	3.53	189600	3.16	271200	2.71	369600	2.30	482400	2.00	609600	1.81	753600	1.62
45	2700	76600	6.93	102600	5.91	135000	5.10	172800	4.47	213300	4.00	305100	3.43	415800	2.92	542700	2.54	685800	2.29	847800	2.05
50	3000	84000	8.56	114000	7.30	150000	6.30	192000	5.50	237000	4.94	339000	4.24	462000	3.60	603000	3.13	762000	2.83	942000	2.53

AMERICAN BLOWER COMPANY

Detroit, Michigan, U. S. A.

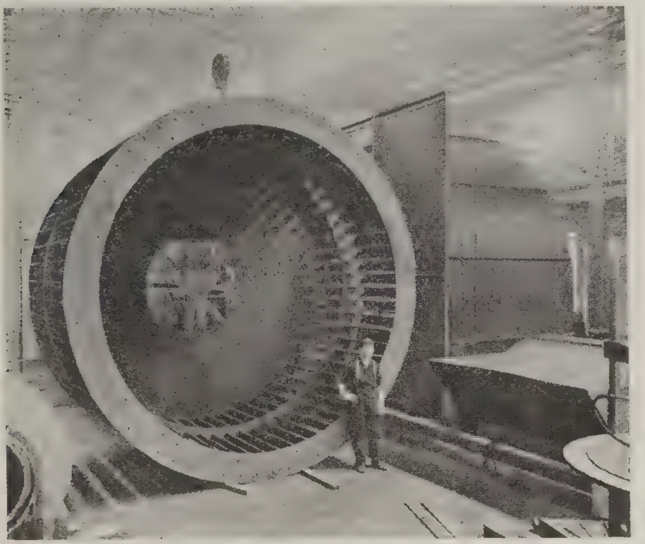
BRANCH OFFICES
ATLANTA
CHICAGO, ILL.
DALLAS
DES MOINES, IA.
Hendrie & Bolthoff,
DENVER, COLO.
INDIANAPOLIS
KANSAS CITY
MINNEAPOLIS

Sirocco
TRADE MARK.

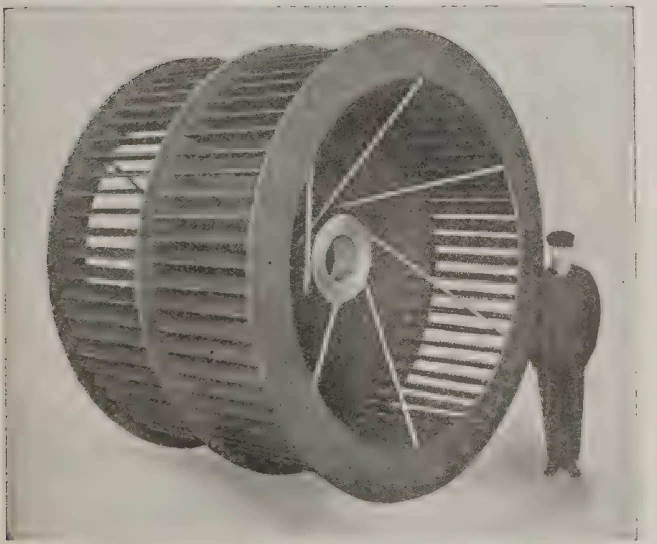
BRANCH OFFICES
NEW YORK
PHILADELPHIA
PITTSBURG
ROCHESTER, N. Y.
ST. LOUIS
SALT LAKE CITY
SEATTLE

Products

Mine Ventilating Fans; Mechanical Draft and Blast Equipment; Heating, Ventilating, Air Conditioning and Drying Apparatus; Vertical Enclosed Self-Oiling Engines; Detroit Systems for Handling Condensation.



Single Inlet "Sirocco" Fan Wheel in Course of Construction.



Double Inlet "Sirocco" Mine Fan Wheel.

The "SIROCCO" is the ORIGINAL fan of the many blade or turbine type. The description in the letters of patent is so carefully given that the imitators of the Sirocco Fan have not been able to put into their fans the distinguishing features that make the Sirocco the most efficient fan for mine ventilation.

THE INLET of the Sirocco Fan is from 25 to 100% larger than other types, because there are 64 narrow blades instead of fewer wide blades.

The air enters this inlet, which has a diameter almost equal to that of the fan itself, without whirling and consequently the blades act on air which is relatively at rest in regard to the motion of the blades instead of acting on air which is whirling in the same direction as the blades are moving.

Anyone can easily appreciate the increase which this will make in the amount of air forced out from between the revolving blades.

THESE 64 BLADES are inclined forward in the direction of rotation. The narowness and peculiar angle of the blades greatly improve the stream lines of air leaving the fan. The air leaves the blades and travels forward in the same path as the air which has just preceded it. In other words, the air is not thrown off at one hundred different angles causing eddies and cross currents and thus absorbing valuable energy in overcoming them and driving the air forward.

The blades are mounted on a heavy steel disc, which, in turn, is fastened to a heavy cast iron hub, accurately bored and key-seated to receive the shaft. The outer annular ring is reinforced with heavy tie rods of drop forged carbon steel, so arranged as to form a bracing unexcelled for strength, but which does not obstruct the free inflow of air.

The SHAFTS are forged steel, ground to size.

The BEARINGS in the smaller sizes are self-aligning, in the larger sizes rigid, with provision for lateral and vertical adjustment. All are double ring oiling and lined with our special babbitt metal.

The HOUSINGS are built of the best quality leveled steel plate, heavily stiffened, and are provided with adjustable inlet cones. This permits the wheel being removed without dismantling the housing, and further reduces inlet losses.

"SIROCCO" Fans have the highest volumetric, manometric, and mechanical efficiencies of any fan on the market.

The great capacity of "Sirocco" Fans enables the use of smaller diameter wheels, whereby smaller foundations are required, with MARKED SAVING IN INSTALLATION COST.

LOW TIP SPEEDS mean long life.

HIGH MECHANICAL EFFICIENCY means low power requirements and economy of operation. The saving in cost of operation will pay for the fan in a short time. If you are using other types of fans, "power eaters," it will pay you to scrap them and install "SIROCCO." If you are in the market for new equipment you will be money ahead if you install a "SIROCCO," even if you could get another without cost.

THE MOST DISCRIMINATING USERS, not only in mine work, but in all the other fields requiring fans or blowers, have selected the "SIROCCO" fan as a standard. Included in this class might be mentioned the United States Government, all the large corporations, and leading engineers and architects throughout the country. A list of users will be gladly furnished on application.

"SIROCCO" Fans can be furnished in all the usual arrangements, for exhausting or blowing, reversible or not, and arranged for belt, rope, chain or geared drive, or for direct connection to engine or motor.

Inquiries should be as explicit as possible, with detailed information as to the conditions. Let our skilled corps of engineers give you the benefit of our experience, to your ultimate profit.

Some Important Users of "Sirocco" Fans:

ANACONDA COPPER MINING CO., Butte, Mont., 97 fans at various mines.

POND CREEK COAL CO., Williamson, W. Va., and U. S. COAL & OIL Co., Holden and Monaville, W. Va., 11 fans.

PITTSBURGH COAL CO., 5 fans at various mines in Pennsylvania.

Crescent Mine of Pittsburgh Coal Co.

One of 2 "Sirocco" Fans at United States Coal & Oil Co., at Holden, W. Va.

View of No. 12 Double Inlet "Sirocco" Fan, at Work in the McLean County Coal Mines at Bloomington, Ill.

NORTHWESTERN IMPROVEMENT CO., Roslyn and Tacoma, Wash., 4 fans.

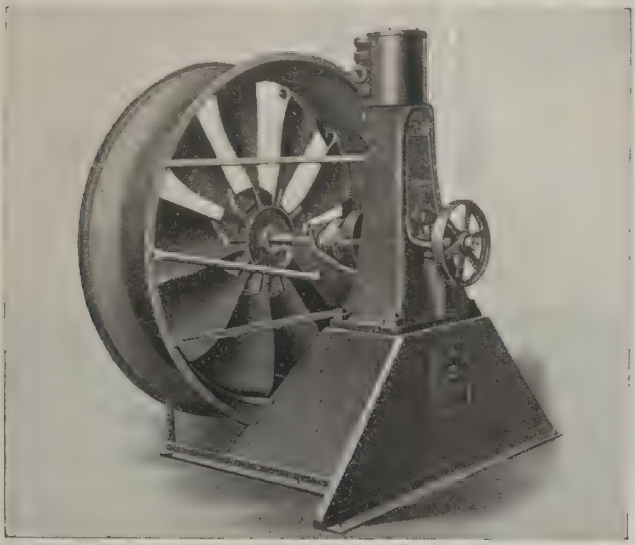
MITSUI & CO., New York City, (for distribution in Japan) 31 fans.

CAMBRIA STEEL CO., Johnstown, Pa.

And many others.

Ventura Disc Mine Fans

THE VENTURA DISC MINE FAN is especially adapted to the ventilation of DRIFT MINES and for DEVELOPMENT WORK on new operations where the requirements do not exceed the quantities given in the following capacity table.



The fan is of EXTRA HEAVY CONSTRUCTION, having ten die-formed curved blades, in the larger sizes reinforced. A large cone-shaped central disc prevents any back draft. The shafts are extra heavy, ground to size.

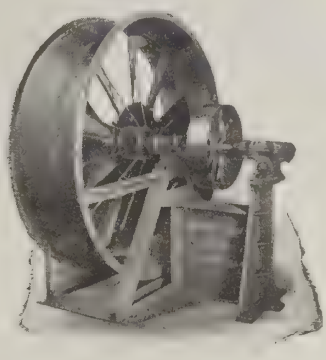
The BEARINGS are double ring oiling adjustable, lined with our Special Babbitt, and are mounted on heavy cast iron pedestal. THIS BRINGS THE BEARINGS OUTSIDE THE DRIFT, WHERE THEY ARE EASILY ACCESSIBLE. Furthermore, this permits the wheel being overhung, WHEREBY IT MAY BE EASILY REVERSED in a few minutes.

The MECHANICAL EFFICIENCY is very high, it requiring but two-thirds the horse-power of any other fan for the same air duty.

In addition to the regular line of pulley fans, it can be furnished with direct connected engines or motors to suit the usual electric currents encountered.

General Data

DIAMETER OF WHEEL	LIST PRICE	PULLEY		DIAMETER OVER ALL	DIAMETER OF SHAFT	WIDTH OF CASE	SHIPPING WEIGHT IN POUNDS	TELEGRAPHIC CODE WORD
		DIAMETER	FACE					
48	$185	13	5¼	58	1 13/16	15¾	750	Mealy
54	205	14	6¼	65	1 15/16	17½	850	Meander
60	295	16	6¼	72	2 11/16	19½	1200	Meandry
66	330	16	7¼	79	2 13/16	21½	1400	Mease
72	370	18	8	85	2 15/16	24	1600	Meated
84	550	20	9	101	2 15/16	27	2100	Meatus
96	750	24	10	107	3 3/16	31½	2600	Meawl



CAPACITY TABLE FOR MINE VENTILATION FOR ALTITUDES UP TO 1000 FEET

DIAMETER OF WHEEL INCHES	¼" PRESSURE			⅜" PRESSURE			½" PRESSURE			⅝" PRESSURE		
	CU. FT. MIN.	R.P.M	B.H.P.	CU. FT. MIN.	R.P.M	B.H.P.	CU. FT. MIN.	R.P.M	B H.P.	CU. FT. MIN.	R.P.M	B.H.P.
48	12,550	424	0.97	15,320	518	1.77	17,770	598	2.73	19,870	670	3.82
54	15,800	376	1.22	19,300	460	2.22	22,380	532	3.43	25,000	594	4.8
60	19,400	338	1.49	23,750	414	2.73	27,500	478	4.22	30,700	535	5.9
66	23,400	308	1.80	28,550	377	3.28	33,100	436	5.06	37,000	488	7.12
72	27,800	282	2.14	34,000	345	3.92	39,400	398	6.05	44,000	446	8.48
84	37,750	241	2.9	46,100	296	5.3	53,500	342	8.2	59,750	382	11.5
96	49,000	211	3.76	60,000	259	6.91	69,500	299	10.7	77,650	335	14.9

	¾" PRESSURE			1" PRESSURE			1¼" PRESSURE		
48	21,700	731	5.0	25,100	846	7.71	28,000	946	10.75
54	27,340	650	6.3	31,600	751	9.7	35,300	840	13.55
60	33,600	584	7.74	38,800	676	11.9	43,450	755	16.7
66	40,400	533	9.3	46,700	615	14.35	52,200	688	20.1
72	48,150	488	11.1	55,600	564	17.1	62,250	630	23.9
84	65,350	418	15.0	75,500	483	23.2	84,300	541	32.4
96	85,000	366	19.6	98,000	423	30.1	109,820	473	42.1

The pressures at the top of the columns are static pressures in inches of water.

Under the conditions assumed in making up this table, the capacities given, are guaranteed to be correct. At any of the above speeds, the volume of air delivered will be less, if the resistance is more than has been assumed, in which case the resulting pressure will be higher and the horse power required greater.

DODGE SALES & ENGINEERING CO.

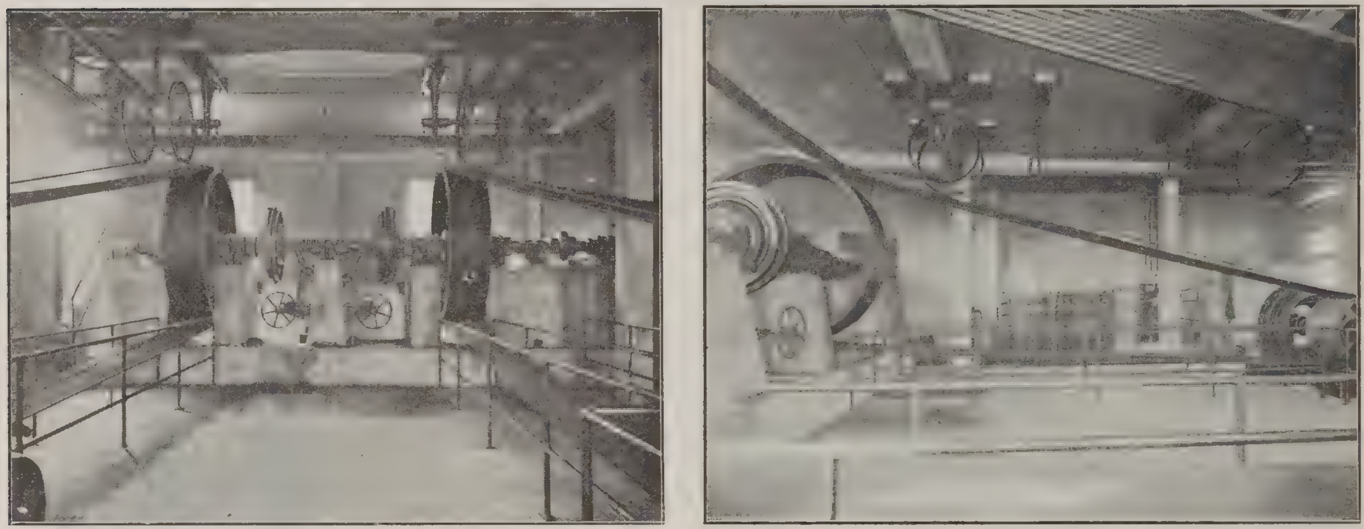
MISHAWAKA, INDIANA

Distributor of the Product of

Dodge Manufacturing Company

Builders of

"Everything for the Mechanical Transmission of Power"



Rope Driven Ventilating Fans installed in the Monongahela River Consolidated Coal & Coke Company's Crescent Mine near California, Washington County, Pennsylvania.

The pre-eminent ideas governing the design of the ventilating equipment of the Monongahela River Consolidated Coal & Coke Co.'s Crescent Mine, located near California, Washington County, Penna., were to provide against interruption of service, and to secure a permanent, fire-proof construction that would endure throughout the life of the mine, combined with the highest possible efficiency of the fan.

The desirability of continuous operation is easily appreciated, and, in emphasis of the importance of permanent construction, it may be said that with an output of 6000 tons daily the estimated life of this mine is 35 years.

Cost of power is apparently often disregarded or passed over with the thought that the generation of a few horse-power will show no appreciable increase in the expense of operation, but the fact remains that every horse-power generated represents an expenditure of money.

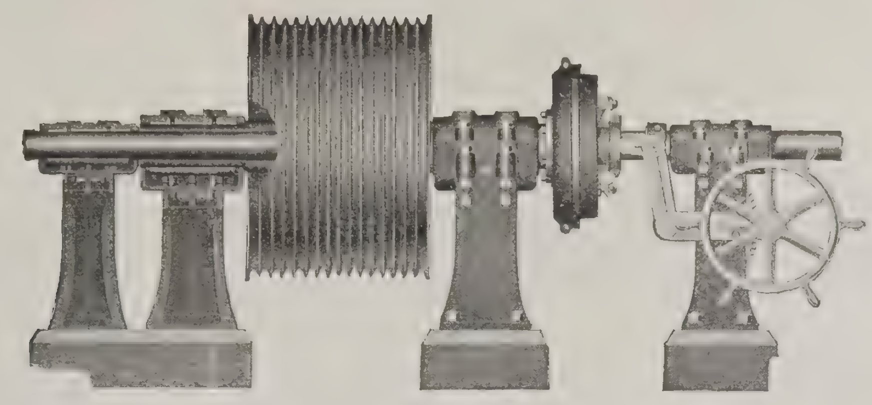
In the case of this installation each per cent. increase in efficiency means a saving of approximately four horse-power, or say $400 annually; an amount justifying a considerable outlay, tending to increase the efficiency.

For the fulfillment of the above conditions, several innovations were employed. Chief among these may be mentioned the duplication of the fan-driving machinery.

Power Transmission to the Fan

The fan is driven by Dodge rope transmission from two 300-hp., 450-r.p.m., 2300-volt, 60-cycle, three-phase-wound motor, variable-speed, induction motors.

To provide for increased ventilation in an emergency, the rope sheaves are proportioned to operate the fan at normal speed with a motor speed of 400 r.p.m., so that full motor speed would run the fan at 172 r.p.m., or ten per cent. above normal.



Single Quill Installation showing Dodge Self-Oiling Bearings and Dodge Split Friction Clutch.

The rope transmission are the Dodge Manufacturing Co.'s American or single rope system, each carrying sixteen wraps of 1-in. manila rope, and are duplicates in every particular.

The motor sheaves are 42 in., and the driven sheaves 107 in. in diameter. These latter are mounted on hollow or quill shafts through which a 7-in. jack shaft passes. The jack shaft is rigidly connected to the fan axle with a flanged coupling and is engaged by 48-in. Dodge split friction clutches bolted to flanges on the ends of the quill shafts and operated by handwheel and pinion.

The quill and jack shafts are supported indepently in Dodge adjustable Self-oiling Bearings, resting on concrete pedestals, which are joined by a continuous concrete footing to prevent uneven settling.

The motors are set 30 ft. centers from the jack shaft, which gives sufficient room to operate the tension carriages inside the building. The winding sheaves and tension carriage tracks are placed directly above the driving ropes, and are bolted to timbers, which are in turn secured by anchor bolts to concrete leveling pads on the under side of the roof.

With this arrangement extreme accuracy in setting the anchor bolts is avoided and the alignment of sheaves and tracks greatly facilitated.

Either drive can be thrown in or out without changing the speed of the fan, in fact the sheaves and clutches on the quill shafts being split, one drive could be dismantled without interfering with the operation of the other.

The ropes run exceedingly smooth and are practically noiseless, and in addition when worn out their replacement is a matter of small expense.

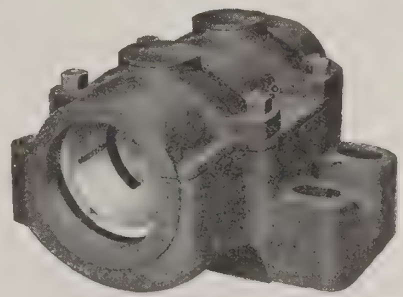
The foregoing description of a rope drive fan installation contains a suggestion that should be welcomed by every progressive mine owner or operator.

The dependability of rope-driven apparatus; the low cost of upkeep; the ability to use either one or both drives; are arguments for non-stop economical operation that cannot be ignored.

Forcibly, too, the argument comes home to the man who considers this equipment, that the twin drives with quill and clutches complete will cost approximately the same as would a first-class belt drive using a good grade of leather belt.

In the belt drive the belt would constitute the major expense of installation, while in the rope drive the rope is the minor consideration; just so in the belt drive the wear comes on that part of the equipment which costs the most to renew, while in the rope drive the wear is absorbed by the least expensive unit, the rope.

Surely this whole matter is worthy of the consideration of those who seek high efficiency, uninterrupted service, and low cost of upkeep.



Dodge Self-Oiling Adjustable Pillow Block.

Dodge Engineers are always at your disposal. Their services cost you nothing; the value of their advice is not measured in dollars and cents, but as you recognize their efforts as being solely in your interest and for your profit.

THE JEFFREY MANUFACTURING COMPANY

Main Office and Works: 962 North Fourth St., Columbus, Ohio

SALES OFFICES:

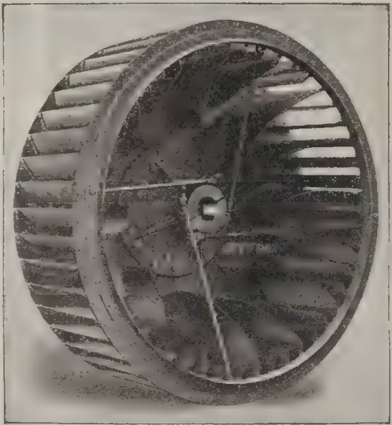
New York............50 Dey Street
Boston.............141 Milk Street
Philadelphia. Real Estate Trust Bldg.
Pittsburgh......Farmers Bank Bldg.
Scranton, Pa..Union Nat. Bank Bldg.
Broadwell, O........H. H. Townsend
Middlesboro, Ky..Middlesboro Hotel
Charleston ....West Virginia
Chicago ....McCormick Bldg.
St. Louis...Railway Exchange Bldg.
Milwaukee...........M. & M. Bldg.
Denver....First National Bank Bldg.
Seattle...........L. C. Smith Bldg.
Birmingham......Brown-Marx Bldg.
Dallas..........................Commonwealth Nat. Bank Bldg.
Canadian Works ....Montreal

Jeffrey Stepped Multi-Bladed Mine Ventilation Fans

are built to handle the air at low velocities.

The Jeffrey Multi-Bladed Fan Wheel

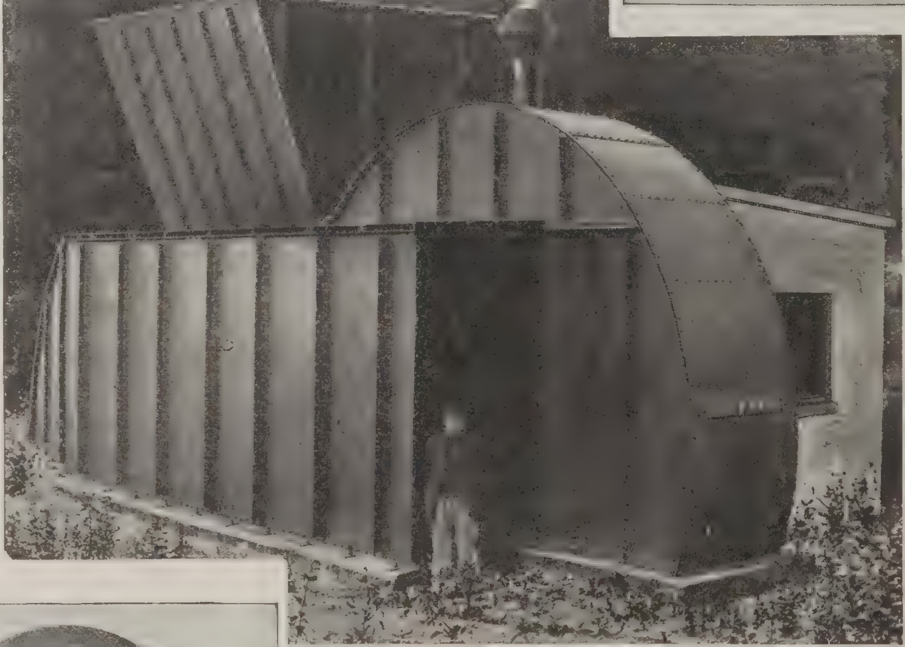
with its stepped series of blades receives the air at a low velocity and accelerates it without shock, which means the maximum of economy in operation.



Single Inlet Stepped Multi-Bladed Fan Wheel

Your interests can be best served by a concern whose fans are designed for one purpose only—the ventilation of mines.

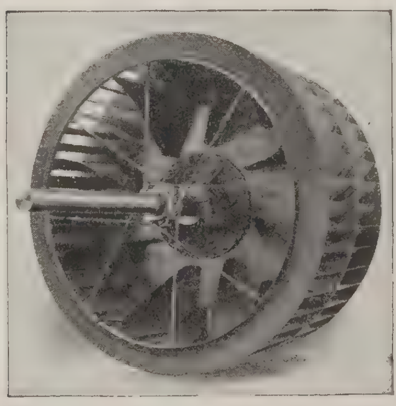
Carefully consider that the Jeffrey Stepped Multi-Bladed Fan requires less power for its operation than any other fan heretofore offered.



Complete Steel Casing

extending to the ground line saves masonry work and reduces cost of installation to a minimum.

We adapt our fan casings to meet any conditions and provide explosion doors for same.



Double Inlet Stepped Multi-Bladed Fan Wheel

We build the Most Complete Line of Fans for the Ventilation of Mines made by any manufacturer in the World.

Jeffrey Centrifugal Fans

are built in sizes from 2 ft. to 20 ft. with capacities from 10,000 to 600,000 cubic feet per minute.

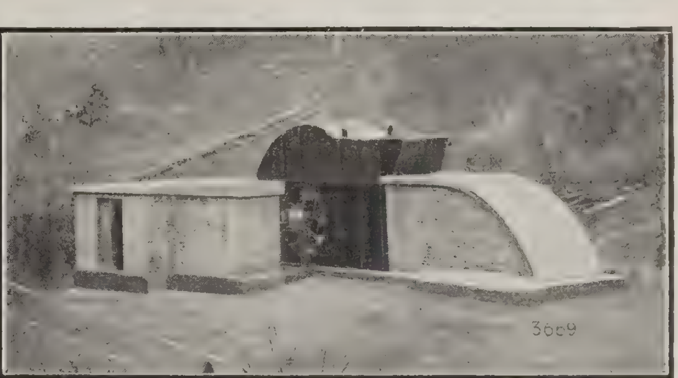
We also build Centrifugal Booster Fans and a complete line of Disc Fans.

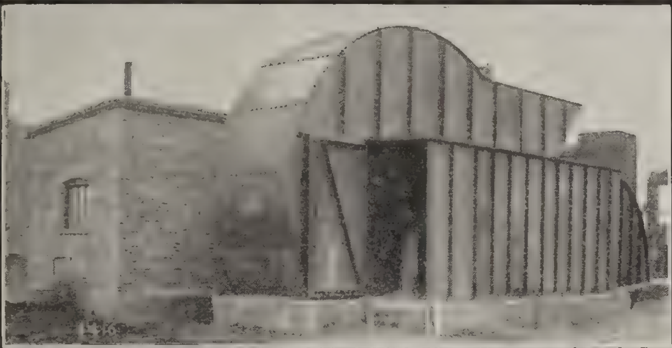
Write for "Jeffrey Mine Ventilation Catalog," the most complete ever published.

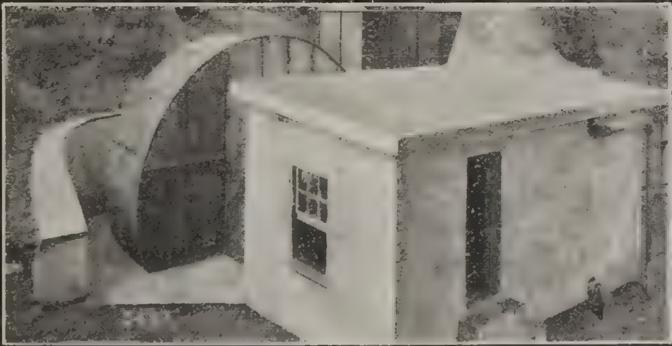
The illustrations on the opposite page will give a comprehensive idea of the designs best adapted to any particular installation. These illustrations cover the majority of standard designs, yet there are some locations where a different arrangement is required, and estimates covering same will be furnished upon request.

The fans are built for direct connection to an engine and in the small sizes they can be direct coupled to a heavy slow speed motor. They are also arranged for belt drive from a motor or an engine, and where space is limited a silent chain drive may be used on the smaller fans.

Jeffrey Mine Fan Installations







THE JEFFREY MANUFACTURING COMPANY

Useful Information for Selecting a Jeffrey Mine Fan

Volume.	Water Gauge.	B. H. P.	Double Inlet Fans.	R. P. M.	Volume.	Water Gauge.	B. H. P.	Double Inlet Fans.	R. P. M.
6000	¼"	½	2'x18"	260	100000	1"	22	10'x4'	100
8000	½"	1		367	123000	1½"	42		123
10000	¾"	1.8		448	141000	2"	62		141
12000	1"	3		520	173000	3"	115		173
15000	1½"	5.5		633	200000	4"	178		200
17000	½"	2	3'x2'	244	125000	1"	28	12'x4'	84
21000	¾"	4		300	177000	2"	79		119
24000	1"	6		346	218000	3"	145		146
30000	1½"	11		423	250000	4"	222		168
34000	2"	17		487	280000	5"	311		188
25000	½"	3	4'x2'6"	183	150000	1"	33	14'x5'	70
31000	¾"	6		224	214000	2"	95		100
36000	1"	9		259	261000	3"	174		122
44000	1½"	17		317	300000	4"	267		140
50000	2"	25		366	338000	5"	376		158
35000	½"	.5	5'x3'	146	175000	1"	39	16'x5'	63
43000	¾"	8		179	245000	2"	109		88
50000	1"	13		207	300000	3"	200		108
60000	1½"	23		254	350000	4"	311		126
70000	2"	35		292	386000	5"	430		139
50000	½"	7	6'x3'	122	283000	2"	125	18'x6'	79
70000	1"	18		172	344000	3"	230		96
86000	1½"	32		211	400000	4"	355		112
100000	2"	50		244	443000	5"	492		124
120000	3"	90		294					
75000	¾"	14	8'x3'6"	108	315000	2"	140	20'x6'	70
91000	1"	23		124	380000	3"	250		85
106000	1½"	40		152	450000	4"	400		100
129000	2"	65		176	495000	5"	550		110
150000	3"	112		215					

The above table was compiled to give the Mine Superintendent, Manager or those interested in this line of work a comprehensive idea of the results obtained from various sizes of Jeffrey Mine Fans.

It is understood that the widths of the Fans may be changed to meet other conditions; that is, a Fan may be built wider to economically handle a larger volume of air at the same gauge, or on the other hand the Fan may be built narrower to handle a smaller volume at the same gauge while the speed of the Fan remains constant.

The Fans are built for direct connection to an engine and in the small sizes they may be direct coupled to a heavy slow speed motor. They are also arranged for belt drive from a motor or an engine and where space is limited a silent chain drive may be used on the smaller Fans.

In asking for prices on Fans it is essential to give all information possible, and in many cases it is advisable to have one of our experts take up the problem at the Mine and determine the Fan best adapted for your particular requirements and submit plans and specifications for your consideration.

It will pay you to investigate our Centrifugal Booster Fans. They have saved operators thousands of dollars cleaning up old air ways. Built with capacities from 10,000 cu. ft. to 70,000 cu. ft.

The Jeffrey Propeller Fan is a distinct improvement over anything which has heretofore appeared. It embodies new features; it is self contained and is fitted with ball bearing thrust collars placed on each side of the wheel. Simple in operation, easily installed and reversed by simply changing direction of rotation.

The Connellsville Mfg. & Mine Supply Co.

Main Office and Works
CONNELLSVILLE, PA.

Birmingham, Ala.
Brown-Marx Building,

918 Webster Building,
Chicago, Ill.

The Pioneers and Leaders in

Modern High Efficiency Fan Construction

Our Proven Records

Volume Record—675,000 cu. ft. of air per minute on 10.3″ of water gauge at 100 R. P. M.

Efficiency Record—87.2% overall for Fan and Drive on 359 H. P. input and 8293 ft. periphery speed of the wheel.

Note below the evolution of the Lepley Tangential Vari-Length Bladed Fan—the number, the length and the shape of the Fan Blades, as well as the spider construction and its reversing features. Also the years in which these various improvements were put on the market.

We build nearly every conceivable style of Fan so far as their construction, housings and settings are concerned; in Blowing, Exhaust and Reversible; for engine or motor drive; in sizes from 5 ft. to 35 ft. diameter, and widths to suit conditions.

Every Fan is designed as a unit proposition, after having taken all of the known Engineering data and mining conditions into account.

No. 6 cut shows our improved, patented By-Pass through the peripheral portion of the center disc, to equalize the water gauge in both sides of the wheel.

No. 7 cut shows our improved, split, clamped hub spider construction, which spells:—"No More Loose Spiders or Spider Troubles."

Nos. 8 and 9 show our improved, double hinged, reversing doors; designed and introduced in 1901, patented in 1903; which make it possible and easy to obtain the same efficiency in a reversible Fan running either way.

Nos. 10 and 11 show 2 of our representative types of Fans.

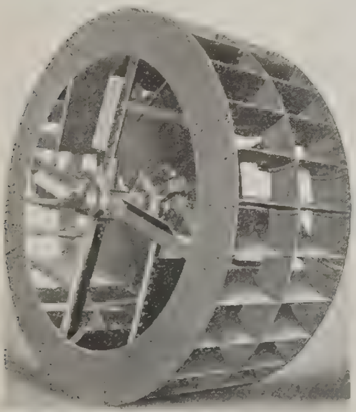
No. 10

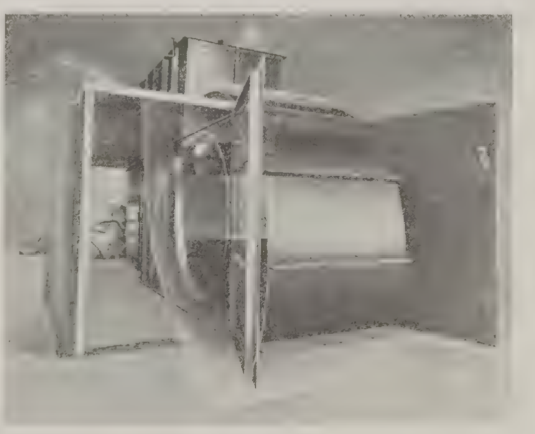
We hold and own four (4) U. S. patents that cover the various original characteristics of this Fan, which is the embodiment of all of the safest and best principles of Fan construction, as well as those which promote the highest degree of efficiency.

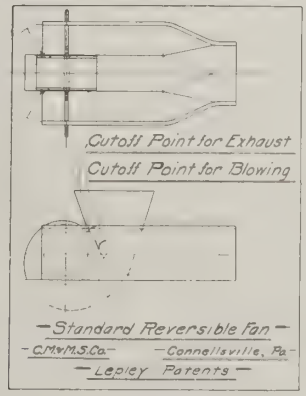
No. 11

This is the "PIONEER" and all others that possess its appearance and features are copies and infringements.

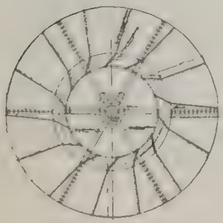
If you will submit your ventilating problems to us, you will receive prompt attention and if you trust us with your business, you can rely on getting satisfying service.

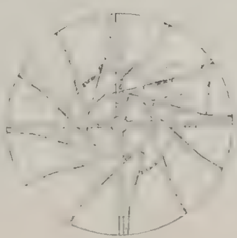

No. 7—1911


No. 8 -1901-03



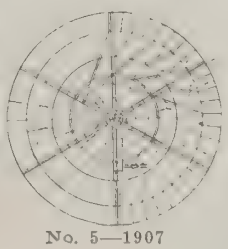
No. 9—1901-03

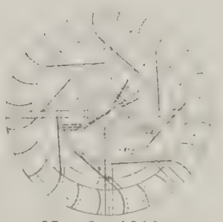

No. 1—1902


No. 2—1904

No. 3—1905

No. 4—1906


No. 5—1907


No. 6—1911

ROBINSON VENTILATING CO.

Successor to J. R. ROBINSON

8044-5 JENKINS ARCADE BUILDING

PITTSBURGH, PENNA.

Products

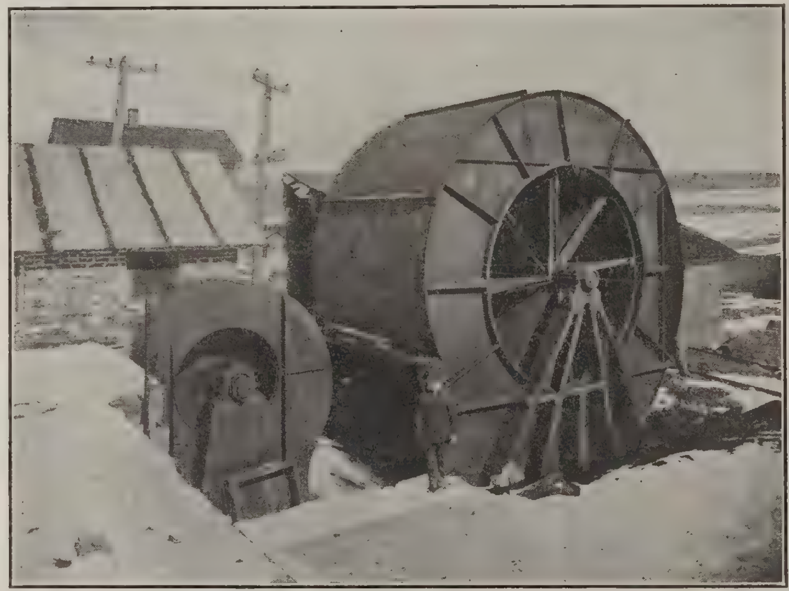
Mine Ventilating Machinery, Power House Blower Machinery, Machinery for the Ventilation of Buildings, and High Pressure Fans for Cupolas, Forges and Furnaces.

Robinson Fans

Robinson Fans are the latest development in fans, for mines, power houses, cupolas or for any purpose where economy of space or power is worth considering.

These fans are the result of careful designing and long years of experience.

Every mine requires ventilating apparatus especially adapted to it. A large part of our business consists of the replacement of machinery and equipment where mistakes have been made—where the machinery has been found to be wasteful and inefficient. We have been able to save from 10 to 60 per cent. of the power consumed by the fans replaced. The reason for this is that the years of study and experiment which we have carried on in this field have resulted in our designs being unequalled in point of economy of power, economy of space, volumetric capacity, manometric capacity and mechanical efficiency. We have adapted ventilating machinery to some of the most difficult mines in the country, under all conditions of service. Installations engineered by us have been most economical as to first cost, maintenance and the use of power. Our experience and engineering knowledge are at your service. You cannot buy a better fan than the Robinson Turbine Fan. And when we install a fan in your mine it will be one to exactly fit the necessities of that mine.



Cut No. 1

Cut No. 1 shows two fans at the Winburne Mine of the Pennsylvania Coal & Coke Company, Winburne, Pa. The large fan is one of the old Robinson type, made 15 years ago, and is operated by a steam engine. A special boiler was required for this fan, and an attendant night and day. The fan has been replaced by a modern Robinson Turbine Fan, driven by electric motor. The power is purchased from a public service corporation. The small fan is doing the same work that the large fan did, and is saving, through the purchased power, the wages of two attendants.

Cut No. 2.

Cut No. 2 shows a Robinson Turbine Fan 8′ diameter driven by a Corliss engine that replaced a Capel fan 16′ diameter. The Robinson fan is doing approximately twice as much work as the old fan with the same power. Since this installation was made at this Federal mine, which is extremely gaseous, and the Company desired to make the mine perfectly safe at all times, and second ventilating fan was desired, the Capel fan was remodeled by the Robinson Ventilating Company, to make it suit the conditions of the mine. The result of this remodeling was to save largely in power. The remodeled fan produced over 100,000 cu. ft. per minute more air than the old fan.

Cut No. 3.

Illustration No. 3 shows the remodeled fan house which gives the Federal Coal & Coke Co. two independent ventilating units, either one of which can be used as desired at a minute's notice in case one of the units requires repairs or attention, it can be shut down. With this equipment it makes this company sure of efficient ventillation at all times under all conditions.

Cut No. 4.

Cut No. 4 shows a fan at the Newburg Shaft of Virginia-Maryland Coal Corporation, Newburg, W. Va. The Newburg Shaft is a high pressure mine and an error was made in installing a low pressure fan. The Robinson fan shown in the cut replaced this low pressure fan, and produces the required air with a great saving of power. The Robinson fan is 5′ 3″ diameter and is operated by a 150 H. P. steam engine. The fan displaced was one of the best modern steel fans 16′ in diameter with a 400 H. P. engine. It was able to produce only 70% of the volume of air that the Robinson fan is producing.

The ventilation of mines is an engineering proposition, and these four illustrations show the benefits accruing to the owners of mines who employ expert ventilating engineers to make the fan installations.

VULCAN IRON WORKS

WILKES-BARRE, PA.

NEW YORK CHICAGO

Vulcan Mine Ventilating Fans, Steam and Electric Hoists; Steam, Gasoline and Air Locomotives

Products

See page 312 for entire list of Vulcan products.

Vulcan Mine Ventilating Equipment

The illustrations show basically the general type of VULCAN Mine Ventilating Equipment.

The design of every VULCAN installation was prepared with four main objects in view—every one of which has been attained in service. First, high blowing efficiency; second, low power consumption; third, absolute and continuous reliability; fourth; lowest possible maintenance costs.

The Fans

Construction can be seen clearly in the engraving below. One of the strongest structural features of VULCAN Fans lies in the spoke arrangement. Just like in the wire wheels used on bicycles and automobiles, the spokes are all in tension. This obviates every possibility of buckling due to air pressure on the vanes.

Vane curvature has been worked out very carefully. Cross eddies and other phenomena that frequently impair fan efficiency have been eliminated. Details of fan construction will be supplied immediately on request.

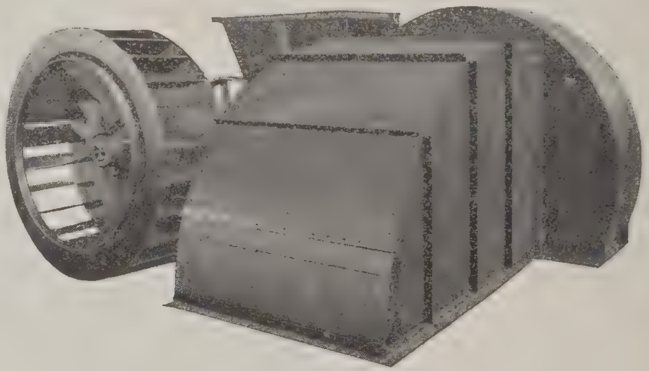
The Housings

Where fans are intended for blowing or exhausting means are provided for reversing the air current with doors easily operated by mechanism provided for the purpose. Fan casings are made of strongly reinforced steel plates. Side drifts, air locks, steel doors and frames are provided according to the requirements.

The housings are either one-half, three-quarters or full, depending on individual conditions.

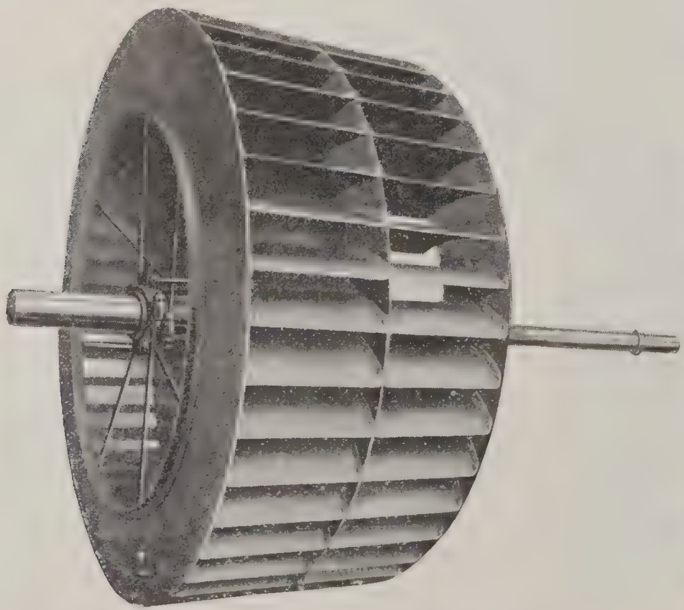
Free Engineering Service

Vulcan Ventilating engineers are always glad to co-operate with prospective purchasers in deciding upon just the right apparatus for their specific conditions. The service involves them in no obligation.



Showing one of the smaller types made by us.

Furnished with steel air-ways or as shown in the above illustration.



Standard designs of large Vulcan Fan. Note particularly construction of tension spokes and vanes.

Fan furnished to one of the large anthracite companies.

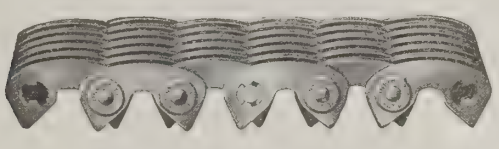
LINK-BELT COMPANY

PHILADELPHIA CHICAGO INDIANAPOLIS

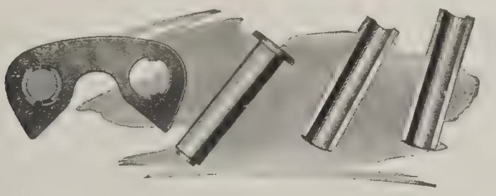
High Grade Chain Drives For All Purposes

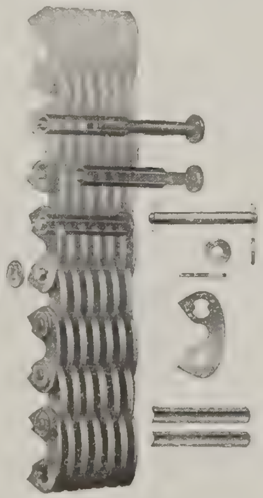
New York	299 Broadway
Pittsburgh	1510 Park Building
Boston	49 Federal St.
St. Louis	Central National Bank Bldg.
Buffalo	698 Ellicott Square
Wilkes-Barre	2nd National Bank Bldg.
Detroit	732 Dime Bank Bldg.
Cleveland	1304 Rockefeller Bldg.
Seattle	580 First Avenue South
Portland, Ore.	14th and Lovejoy Sts.
Los Angeles	161 N. Los Angeles St.
Denver	Lindrooth, Shubart & Co.
Minneapolis	418 So. Third St.
Knoxville	D. T. Blakey
New Orleans	Whitney Supply Co.
San Francisco	Meese & Yottfried
Birmingham	General Machinery Co.
Louisville,	Frederick Wehle, Starks Bldg.
Charlotte, N. C.,	J. S. Cothran, Commercial Bank Bldg.
Toronto, Can.,	Canada Link-Belt Co., Ltd.

Link-Belt Silent Chain is the ideal method of transmitting power—from prime move to machine, or from line to countershaft, for Pumps, Mine Fans, Lineshafts, etc., and any place around the mine where it is important to transmit power without slip or loss. It is as flexible as a belt, positive as a gear, and more efficient than either, (98.2% efficient on actual test). The success of the drive is due entirely to the superiority of its joint construction, which is patented, and found in no other chain. See illustrations. The segmental liners or bushings, which are removable, extend across the entire width of the chain, thus doubling the bearing surface and having the bearing pressure on the joint. The bushings are case-hardened and bear upon the case-hardened pin. The latter is free to, and does rotate with reference to the bushings and presents every particle of its surface for wear. As a result it wears uniformly, keeps round, and the chain maintains to the end its high initial efficiency. Transmits any power at any reasonable speed. A safety first means of transmitting power which combines the advantages of the leather belt and spur gear, and eliminates their disadvantages. Thousands in daily use under all conditions.



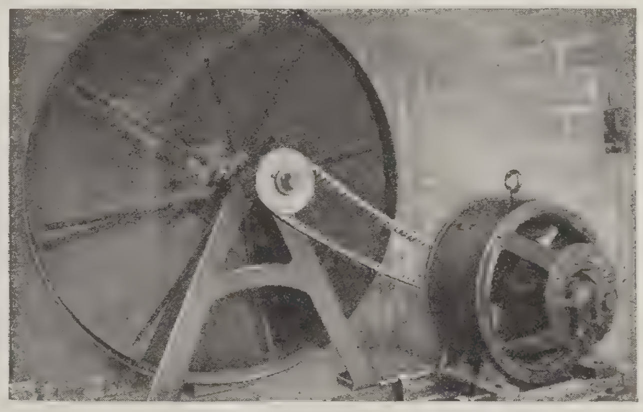
Look for the Name on the Washers.
Look for the Liners in the Joints.





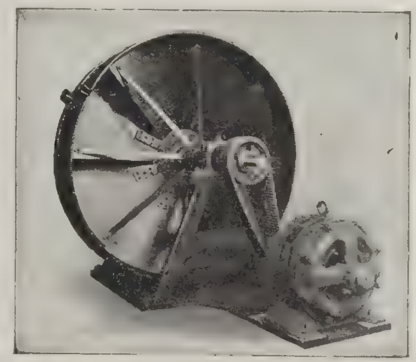
The best is none too good where human life depends on continuous operation.

For driving Fans, Link-Belt Silent Chain permits of compact construction, and requires but a minimum of attention. It is positive, absolutely reliable, and can therefore be depended upon for this all-important work of supplying miners with fresh air. It is the "Safety First" means of transmitting power.



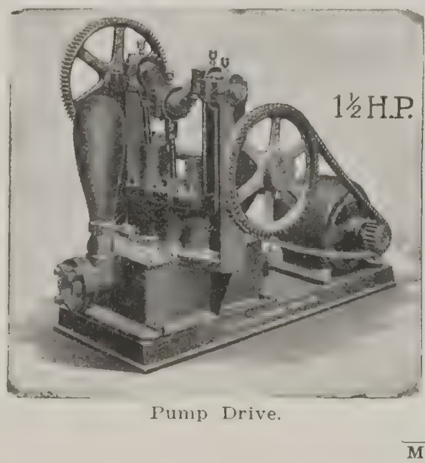
Link-Belt Silent Chain Operating Mine Fan.

We have installed many drives for this service which have been in operation for eight years and longer. The only attention they have ever required is periodic oiling.



Mine Fan Drive.

Link-Belt Silent Chain is a reliable, compact, and highly efficient drive for any machinery around the mine. You can learn all about it by writing for 112-page Data Book No. 125. It contains information for every man who is interested in the economical transmission of power. Sent postpaid on request. Address nearest office. Or send for a Link-Belt service man to explain the advantages personally.



Pump Drive.

The Cutler-Hammer Manufacturing Company

MILWAUKEE, WISCONSIN

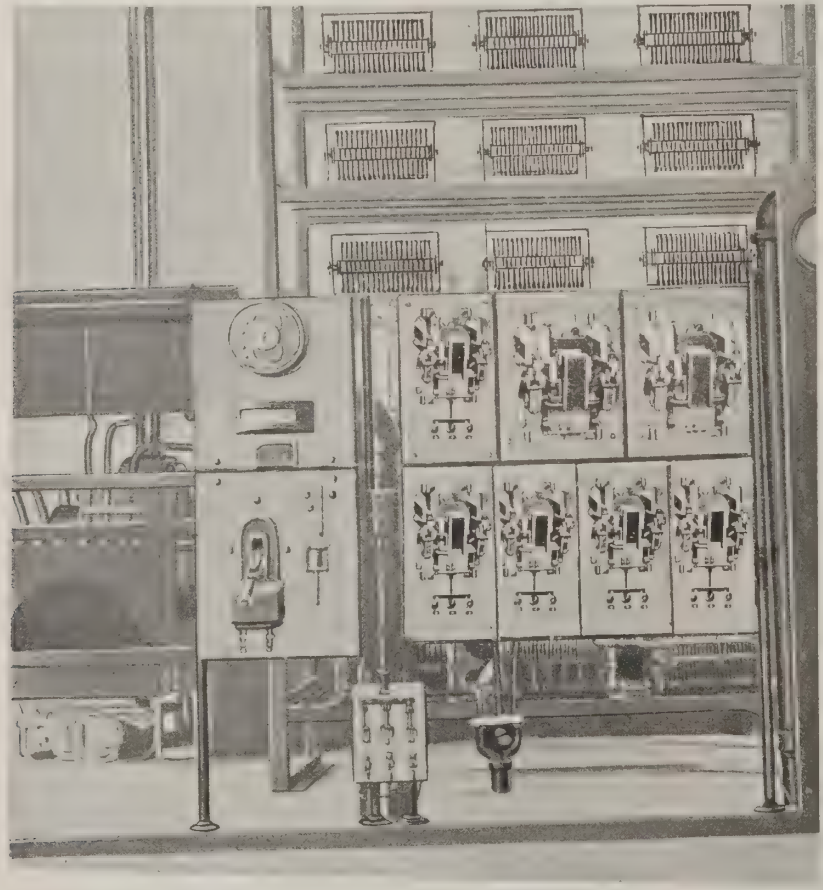
Sales Offices
NEW YORK
PHILADELPHIA
BOSTON
CINCINNATI
PITTSBURGH
CLEVELAND
CHICAGO

Pacific Coast Representative
H. B. SQUIRES CO.
San Francisco, Cal., Los Angeles, Cal.
Seattle, Wash.

The Cutler-Hammer Manufacturing Company has specialized in the design and construction of electric control apparatus for motors for the last 23 years. The complete line for **mine service** includes both Manual and Automatic Controllers for hoists, fans, pumps, rope hauls, cableways, storage battery locomotives and tipples, as well as Battery Charging Equipments for miners' storage battery lamps and for electric locomotives and trucks. C-H Magnetic Separating Pulleys have been used for years for removing iron from the coal on conveyors and picking tables.

In the design of controllers for mine service special attention has been paid to the following conditions:

1. **Moisture conditions** and **acid reaction** of **mine waters** have been met by impregnating all coils;—by special resistance;—by using copper and brass as far as possible;—and by japanning and spraying all iron parts.



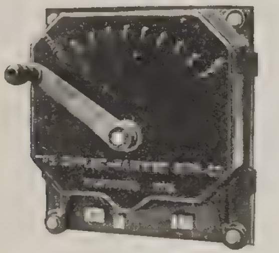
Automatic Controller for Mine Exhaust and Blowing Fan driven by a 750 H. P. 2200-volt, three-phase wound-rotor motor.

2. **Fluctuating Voltage conditions** have been met by using coils that operate over a wide range of voltage and by employing all heavy duty resistance for starting service.

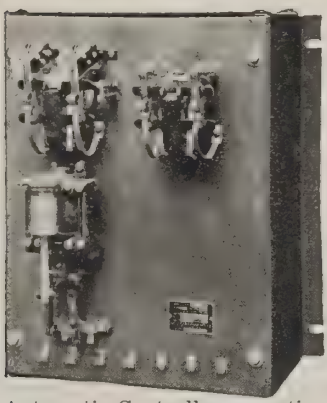
3. **Reliability,**—durable, tried construction used throughout with wearing parts renewable.

4. **Motor Protection** is provided against failure of voltage, interruption of the current supply and overload.

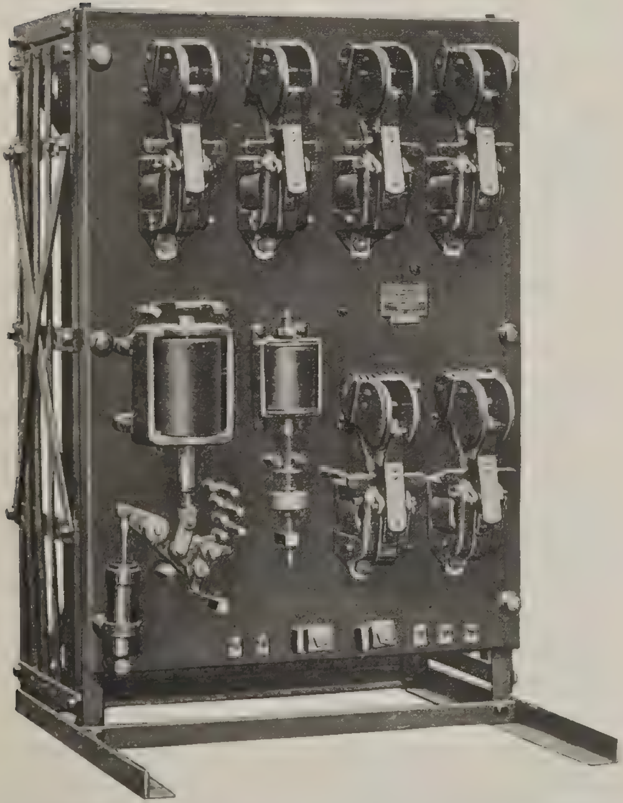
5. **Continuous Service.** In case of drop in the voltage of the system, the special Cutler-Hammer "Mine Duty" resistance and solenoid coils permit the motor to **keep on running** at reduced speeds **without** causing **sparking** at the brushes.



Moisture-Proof Motor Starter.



Automatic Controller, operating in conjunction with two speed squirrel cage motor, direct connected to booster fan.



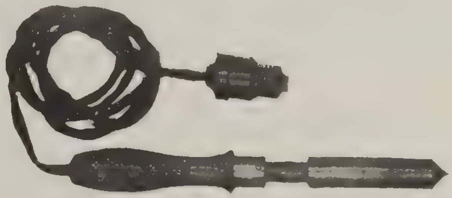
Automatic Starter (50 H. P., 500 Volt), for use with motor-driven mine fan or pump.

Special controllers are made for use in mines having a large number of self-starting direct current motors so as to make it unnecessary to block the circuit breakers in the power house or have the attendant hold the circuit breaker closed while the motors are starting due to the circuit breaker opening on a short circuit.

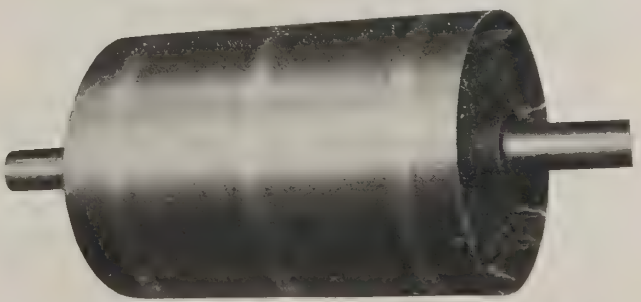
Controllers are made for mines having a small number of motors and buying street car current so that under no condition, from no load to full load, can more than 500 volts enter the mine.

Controllers are made for operation in the opening of new mines, making provision for having the motor operated ventilating equipment used as the entries are extended.

Automatic Starters are made for small motors in gaseous mines to automatically start and stop the motor-driven pump according to predetermined water levels in the sump.



Electric Soldering Iron for Repair Work.



Magnetic Separating Pulley, used with conveyors to remove pick heads, bolts, nuts, etc., from coal. Ask for Bulletin 12.

GENERAL ELECTRIC COMPANY

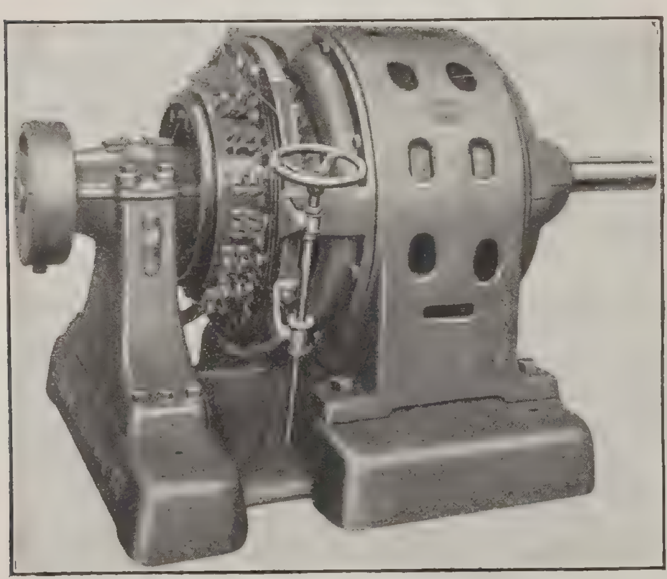
General Office
Schenectady, N. Y.

The Guarantee of Excellence
on Goods Electrical

Sales Offices
In All Large Cities

Electrical Equipment for Mines---Motors

The fan, a vital factor in the operation of many mines, has also received its full share of attention in the progressive application of electric power in the mining industry.



100 H. P., 2200 Volt Brush Shifting Motor for Driving Mine Fans.

The well known advantages of alternating current from the standpoint of generation and distribution have been somewhat handicaped in application in the numerous instances where, for one reason or another, adjustable speed drives were required. For constant speed drives the squirrel cage induction motor offers practically ideal characteristics.

The induction motor with phase wound secondary and rheostatic control has been widely supplied and with entire success save for the handicap inherent with this form of control, i. e., a reduction in efficiency directly proportional to the reduction in speed.

The importance of gaining even a few per cent in efficiency on a 24-hour every-day-in-the-year load will warrant considerable careful attention to the fan drive motors supplied by the General Electric Company.

The adaptation to American conditions of the polyphase brush shifting commutator motor marks an important advance in the application of motor drive to fan service. This type of motor is peculiar in that no external control equipment is required, the entire range of speed from standstill to maximum being obtained by shifting the brushes forward from the neutral position. The practical operating range of speeds varies with the application, but for fan service may be assumed to extend from its normal rated value down to approximately one third speed.

At rated load and speed, the power factor is practically unity and throughout the operating range the apparent efficiency is usually considerably better than for the induction motor with rheostatic control. With brushes at neutral and motor at standstill, a magnetizing current of approximately 10% of normal full load current is drawn from the line.

A second method applicable to standard induction motors with phase wound secondaries involves a polyphase commutator motor which transforms the slip energy of the main motor, taken at voltage and frequency depending upon the fan speed, and drives a standard squirrel cage motor electrically connected to the main supply system, slightly above synchronism, thus causing it to operate as an induction generator. It thus returns to the system energy proportional to the drop in speed of the main motor less, of course, the losses in the regulating set. This method also affords means of correcting the power factor to any desired value and shows a very high efficiency over the entire operating range. This range varies roughly from 35% regulation on 60 cycle systems to 55% on 25 cycle systems.

GOODIN REID & CO.

CINCINNATI
Converters of

Brattice Cloth

RED
DIAMOND
BRATTICE

Non-Inflammable

Unequaled in its fire-resisting qualities, and is also mildew-proof.

Our treatment increases the strength of the fabric and adds greatly to the wearing quality.

The color, a light red, is most suitable for use in the mine.

It is made out of high-grade cotton duck in three styles.

Style "A"

Made from single filling duck. Weight approximately when treated 16 ounces per square yard.

Style "AA"

Made from heavy single filling duck. Weight approximately when treated 16 ounces per square yard.

Style "AAA"

Made from specially constructed heavy double filled duck. Weight when treated approximately 20 ounces.

BLACK
DIAMOND
BRATTICE

Water-Proof

This fabric is made specially for use in places where a water-proof fabric with exceptional wearing qualities is required, and where conditions do not require a high degree of non-inflammability.

Our treatment completely coats the yarn and protects it against the influence of moisture.

This material is being used by many of the largest operators after a series of tests, demonstrating that it would outlast any other brattice cloth on the market.

Made in four grades:

Number 410

Is made of a standard single filling duck. Weight when treated, per square yard, 16 ozs.

Number 308

Made of a standard single filling duck. Weight when treated, per square yard, 14 ozs.

Number 1

Made of standard osnaburg. Weight when treate, per square yard, 13 ozs.

Style E. D.

Made of a special construction double filling duck. Strong and very serviceable. Weight when treated, per square yard, 14 ozs.

Write for detailed information and prices.

LAURIN H. TURNER & CO.

160 West Jackson Boulevard, Chicago, Ill.

Manufacturers of

BRATTICE CLOTH

LAURIN H. TURNER AND COMPANY
MATCHLESS
NON-INFLAMMABLE
BRATTICE
160 W. JACKSON BLVD. CHICAGO

Why use any but the best wearing "MATCHLESS" NON-INFLAMMABLE DUCK BRATTICE CLOTH when bratticing your Mines?

Our styles are as follows:

No. 24—is made from the best quality of cotton duck, treated to be non-inflammable. It is made by stitching two or more breadths together with a double stitched seam, same as old sail, for the width required.

No. 20—is a lighter weight, and in 72″ we can furnish it seamless, but in other widths it is made by stitching two or more breadths together with a double stitched seam for the required width.

We claim for our Cotton Duck Brattice longer service than jute, as it will not fray out as quickly It costs less in the long run. It does not accumulate Coal dust, which is very inflammable, and the best evidence of our claims is the growth of our business and our customers' continued use of our Brattice Cloth.

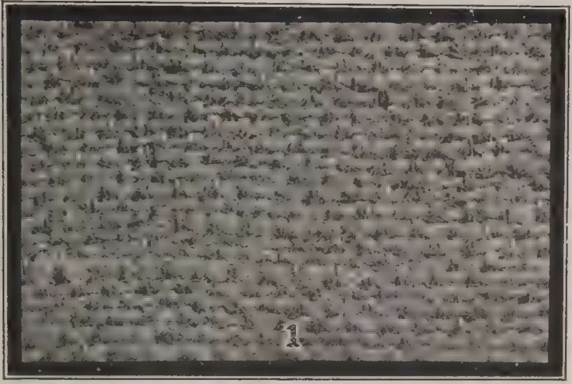
Prompt shipments as stock always on hand.
Samples and Prices will be furnished on request.

ESTABLISHED 1870

FULTON BAG & COTTON MILLS

MANUFACTURERS OF BRATTICE CLOTH
BROOKLYN, NEW YORK CITY, U. S. A.
Atlanta New Orleans St. Louis Dallas Oklahoma City

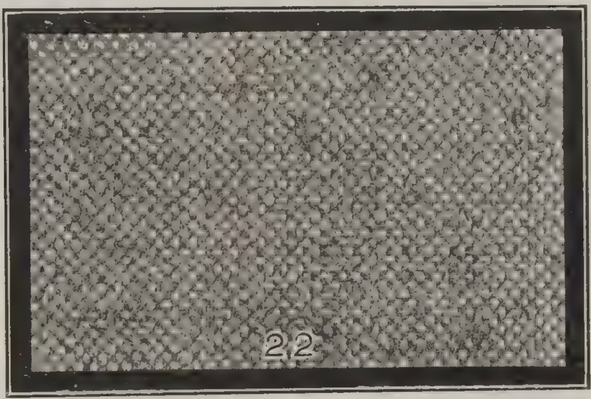
A Brattice Cloth that combines extreme efficiency and extreme economy is the Brattice Cloth for you to use. FFFF Brand possesses both qualities. It is made out of carefully selected fibres, closely woven, and Fireproofed by a chemically scientific process which renders it non-inflammable and at same time practically rot-proof.



FFFF No. 1 is a good Jute Brattice Cloth at a cheap price. A strong, heavy cloth, double warp, durable and non-inflammable. It is especially recommended for temporary brattices and for walls. Preferred to many other qualities sold at much higher prices.

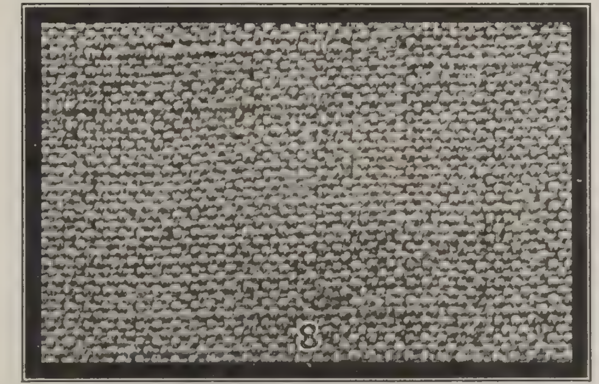
FFFF No. 22. A superior single warp and single weft closely woven fabric, made of selected jute yarns. We recommend this quality next to FFFF No. 8 and have sold it with considerable success in all coal fields for many years.

Always Demand FFFF Brand
Best by Test



Always Demand FFFF Brand
Best by Test

FFFF No. 8 is a non-inflammable Jute Duck constructed out of hard-twisted yarns, for strength, durability and closeness of weave. It makes an ideal Brattice Cloth. Its durability has been established by long years of use, not only in this country, but also in the British Coal Fields and throughout the entire world. The closeness of its weave makes it practically air-tight, thereby wasting the least possible amount of air. It is highly recommended by experts, mine superintendents and students of mine ventilation and efficiency.



Stocks Carried With Leading Jobbers In All Coal Fields
IF YOUR REGULAR JOBBER DOES NOT CARRY FFFF WRITE TO US.
We manufacture other qualities and will gladly send samples and prices.

NO MORE WAITING ON IMPORTATION ORDERS

PROMPT SHIPMENTS FROM OUR NEAREST FACTORY

JOHNSTON-MOREHOUSE-DICKEY CO.

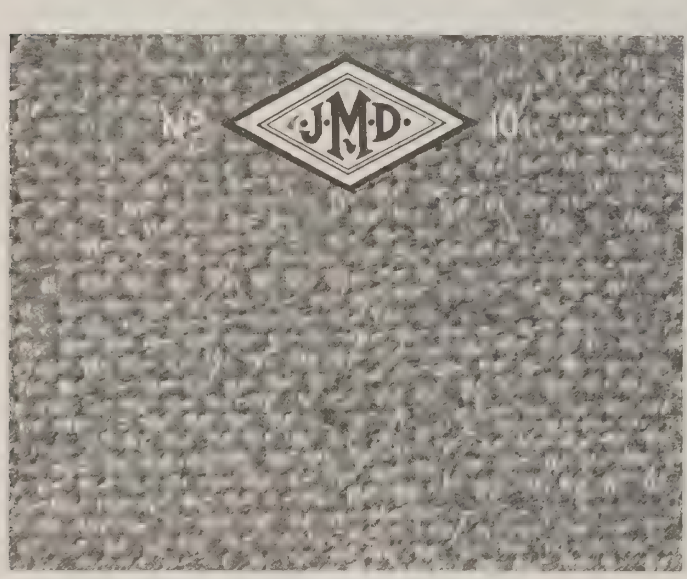
Brattice Cloth Manufacturers

PITTSBURGH, PA.

Established 1902 Court 788

NO. 12

A superior quality, closely woven, non-inflammable Jute Cloth, and is the quality we have made a specialty of for many years and which we recommend as the most satisfactory medium-priced cloth on the market.



NO. 10

A good, strong, heavy, non-inflammable Jute Cloth, which has given entire satisfaction wherever used.

NO. 18

A high-grade, non-inflammable Jute Duck, which we have for many years past supplied to many of the largest colliery companies in the country, and is specially recommended for wet mines.

We make all three grades, in 36″, 48″, 60″, 72″, 84″ and 96″, and are in a position to make prompt shipment.

WRITE US FOR SAMPLES AND PRICES

KEYSTONE
THE.
MINING
CATALOG
COMBINED WITH
COAL FIELD
DIRECTORY
CONSOLIDATED PUBLISHING
COMPANY INC.

HOISTING AND HAULAGE SECTION

Engineering Data

Specification data for Hoisting Engines.
Chart—Vertical unbalanced loads lifted by First Motions Hoisting Engines at various Steam Pressure with drums from 4 to 12 feet in diameter.
Chart—Showing Power Required to Haul Cars on various pitches.
Chart—Showing Piston speed in feet per minute
Chart—Capacity of face of winding Drums.
Chart—Amount of rope wound on drums of various diameters and faces.
Specification data for Haulage Engines.
Table—Tension on Wire Rope for Inclined Planes.
Chart—Rope speed in feet per minute.
Table—Bending and safe working stresses for Cast Steel Ropes (19 wires) running on sheaves of various diameters.
How to order Wire Rope.
Wire Rope Data (Hoisting).
Wire Rope Data (Haulage).
Inspection, care, lubrication and handling of Wire Rope.

The following manufacturers have catalogue descriptions in this section:

Allis-Chalmers Mfg. Co.
American Steel & Wire Co.
Broderick & Bascom Rope Co.
Burnet Co., The.
Cherrytree Machine Co.
Connellsville Mfg. & Mine Supply Co.
Crawford & McCrimmon Co.
Diamond Machine Co.
Everhart Brass Co.
Falk Co.
Flory, S., Mfg. Co.
General Electric Co.
Hazard Mfg. Co.
Holmes, Robt., & Bros.
Leschen, A., & Sons Rope Co.
Lidgerwood Mfg. Co.
Litchfield Fdry. & Machine Co.
Macomber & Whyte Rope Co.
Moon, Geo. C. Co., Inc.
Osborne Machine Co.
Pneumelectric Machine Co.
Roebling's, John A., Sons Co.
Royer & Zweibel.
Texas Co., The.
Thermoid Rubber Co.
Vulcan Iron Works.
Waterbury Co.
Wellman-Seaver-Morgan Co.
Westinghouse Electric & Mfg. Co.
Wright Wire Co.

For additional descriptions of Hoistings and Haulage Equipment, not appearing in this section, Refer to Index of Products in front of the book.

Information Required for Shaft Hoists

Total height of lift (from bottom to dump)..........

Weight of cages and whether self-dumping or platform type..........

Weight of empty car..........

Weight of loaded car (coal)..........

Weight of loaded car (rock, if hoisted)..........

Are men and material to be handled..........

Is hoist to be located at side or end of head frame
give center to center distance of head sheaves..........

Diameter of hoisting ropes preferred..........

Is operator to be located at hoist or in head frame..........

If hoist to be driven by A. C. motor specify voltage, phase and cycle. If to be driven by
D. C. motor give voltage..........

If hoist to be steam driven give steam pressure at throttle or steam pressure carried on boilers
and distance from boilers to hoist..........

Information Required for Slope Hauls

Maximum length of haul..........

Grades in percent as near as possible with length of each and specify curves, if any..........

Number of cars per trip and speed desired or output
in specified time in tons..........

Weight of empty car..........

Weight of loaded car..........

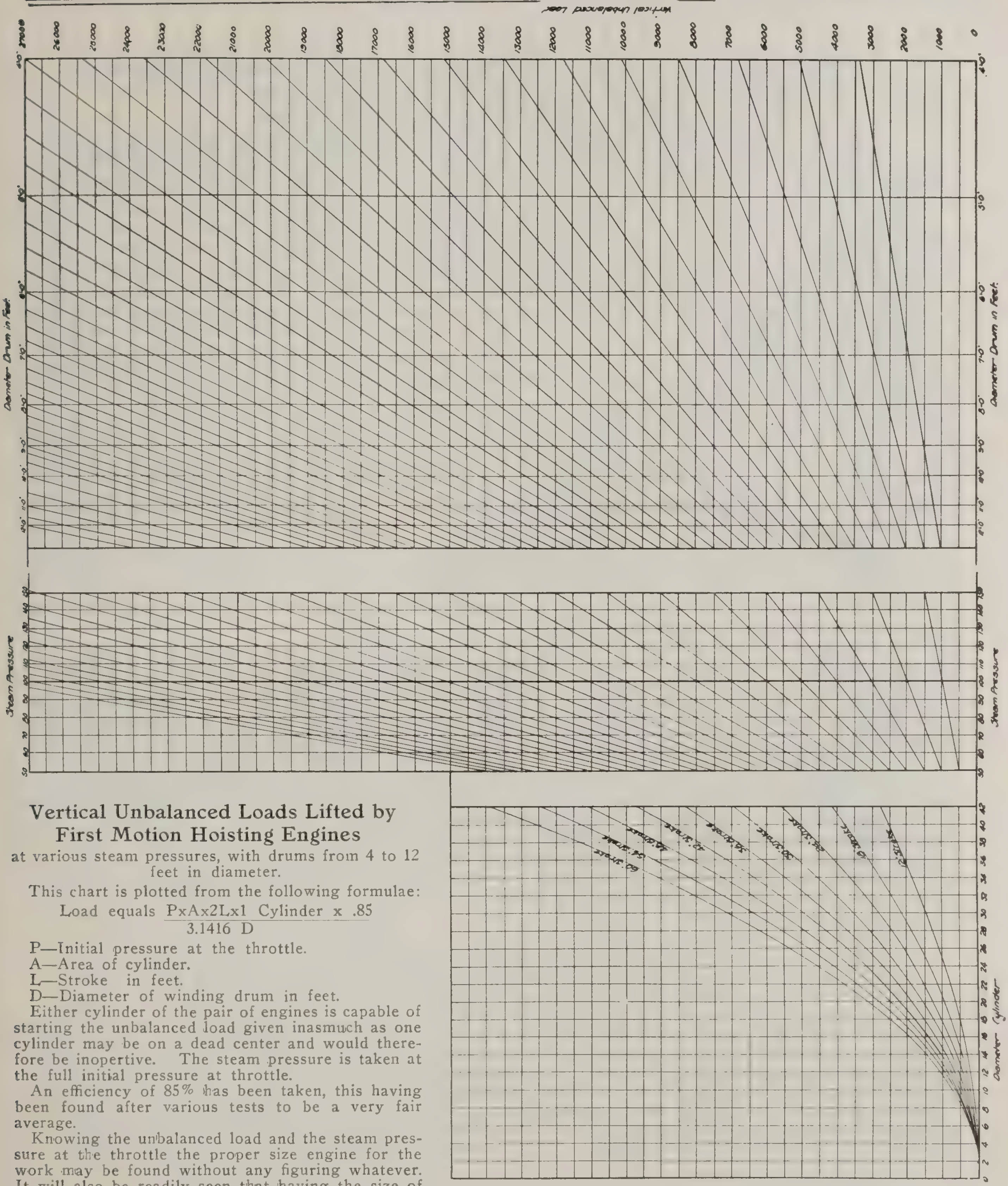
Are cars equipped with roller bearing wheels or plain..........

If hoist to be driven by A. C. motor specify voltage, phase and cycle. If to be driven by
D. C. motor give voltage..........

....

....

If hoist to be steam driven give steam pressure at throttle or steam pressure carried on boilers
and distance from boilers to hoist..........



Vertical Unbalanced Loads Lifted by First Motion Hoisting Engines

at various steam pressures, with drums from 4 to 12 feet in diameter.

This chart is plotted from the following formulae:

$$\text{Load equals } \frac{\text{PxAx2Lx1 Cylinder x .85}}{\text{3.1416 D}}$$

P—Initial pressure at the throttle.
A—Area of cylinder.
L—Stroke in feet.
D—Diameter of winding drum in feet.

Either cylinder of the pair of engines is capable of starting the unbalanced load given inasmuch as one cylinder may be on a dead center and would therefore be inopertive. The steam pressure is taken at the full initial pressure at throttle.

An efficiency of 85% has been taken, this having been found after various tests to be a very fair average.

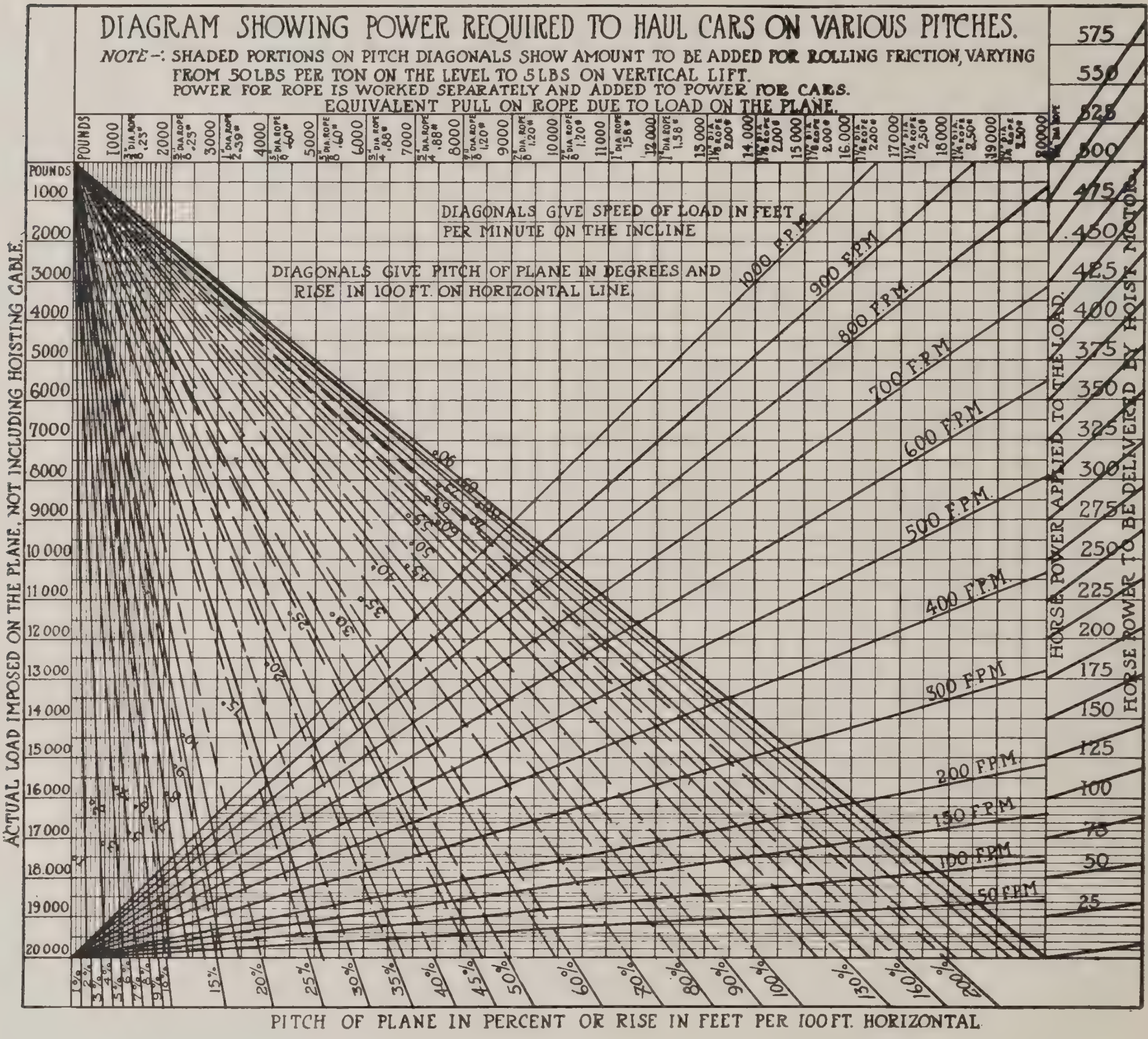
Knowing the unbalanced load and the steam pressure at the throttle the proper size engine for the work may be found without any figuring whatever. It will also be readily seen that having the size of engine cylinders the vertical load that can be lifted by them may also be found for any steam pressure and various diameters of drum.

Example: Find the size engine capable of handling a vertical unbalanced load of 12,000 with 100 pounds steam pressure at the throttle.

The rope manufacturers give the working load for 1" rope as 6.8 tons. However, in actual practice, for this load a 1-¼" rope would probably be used and wound on, say, an 8′ 0″ diameter drum.

Following the horizontal line marked 12,000 until it is intersected by the diagonal line at or about the vertical line representing an 8′ 0″ diameter drum; then follow the diagonal line down to left side of chart; follow horizontal line across until it is intersected by diagonal line at or about the line representing 100 pounds steam pressure; follow this diagonal line as previously described to left side of chart; follow horizontal line until proper combination of stroke and diameter are found. For the work in hand the following engines would be satisfactory: viz: 24x48", 26x42" or 28x36"; the 24x48" size would probably be selected.

Courtesy Vulcan Iron Works.



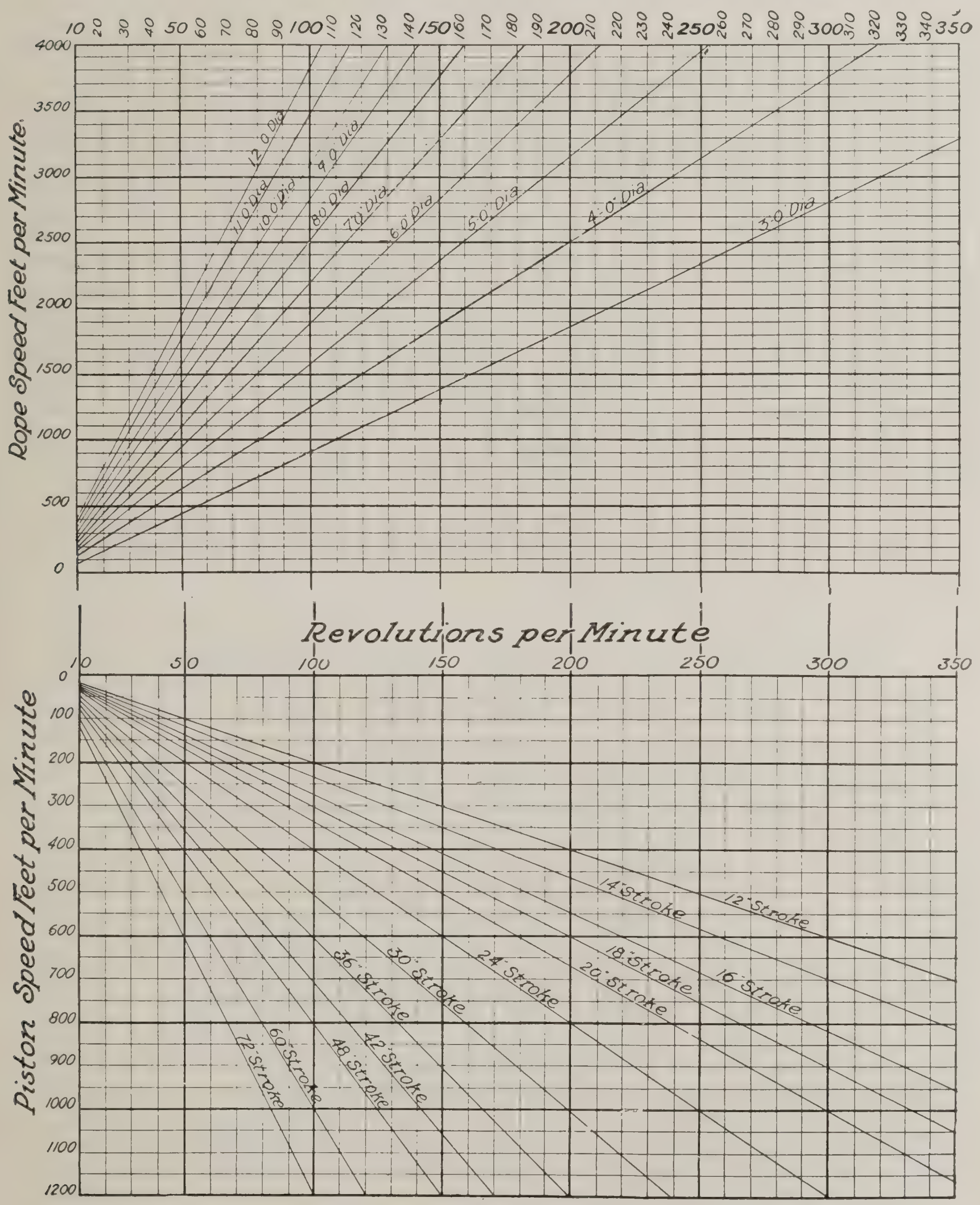
Power Required to Haul Cars on Various Pitches

It is desired to haul two loaded cars, each weighing 6,000 pounds up a plane 1,000 feet long, having a pitch of 40° from the horizontal, at a maximum rope speed of 500 feet per minute. What is the equivalent rope pull? What is the brake horse power required to handle the load?

Example: Two loaded cars weighing 6,000 pounds each equals a load of 12,000 pounds exclusive of winding rope. Follow the horizontal line representing 12,000 on the chart until it is intersected by the diagonal line representing 40°. Directly above this point of intersection will be found the rope pull, which in this case is 7,900 pounds. We also find that a ¾" rope would be satisfactory and that this size rope weighs .88 pounds per foot. Following down this imaginary line representing 7,900 pounds until it is intersected by the diagonal line representing 500 feet per minute rope speed, we read 120 horse power applied to the load, or the brake horse power required. The horse power to be delivered by this hoist motor would be 141; that is, based on an efficiency of 85% for the entire outfit.

We found that ¾" rope would be required and also that this size rope weights .88 pounds per foot; 1,000 feet of rope at .88 pounds equals 880 pounds. By working this out the same way we did for the loaded cars we find it equivalent to nine horse power, which should be added to the 141 horse power, making a total of 150 horse power.

Courtesy Vulcan Iron Works.



Piston Speed, Etc.

In the foregoing proposition assume an average piston speed of 600 feet per minute.

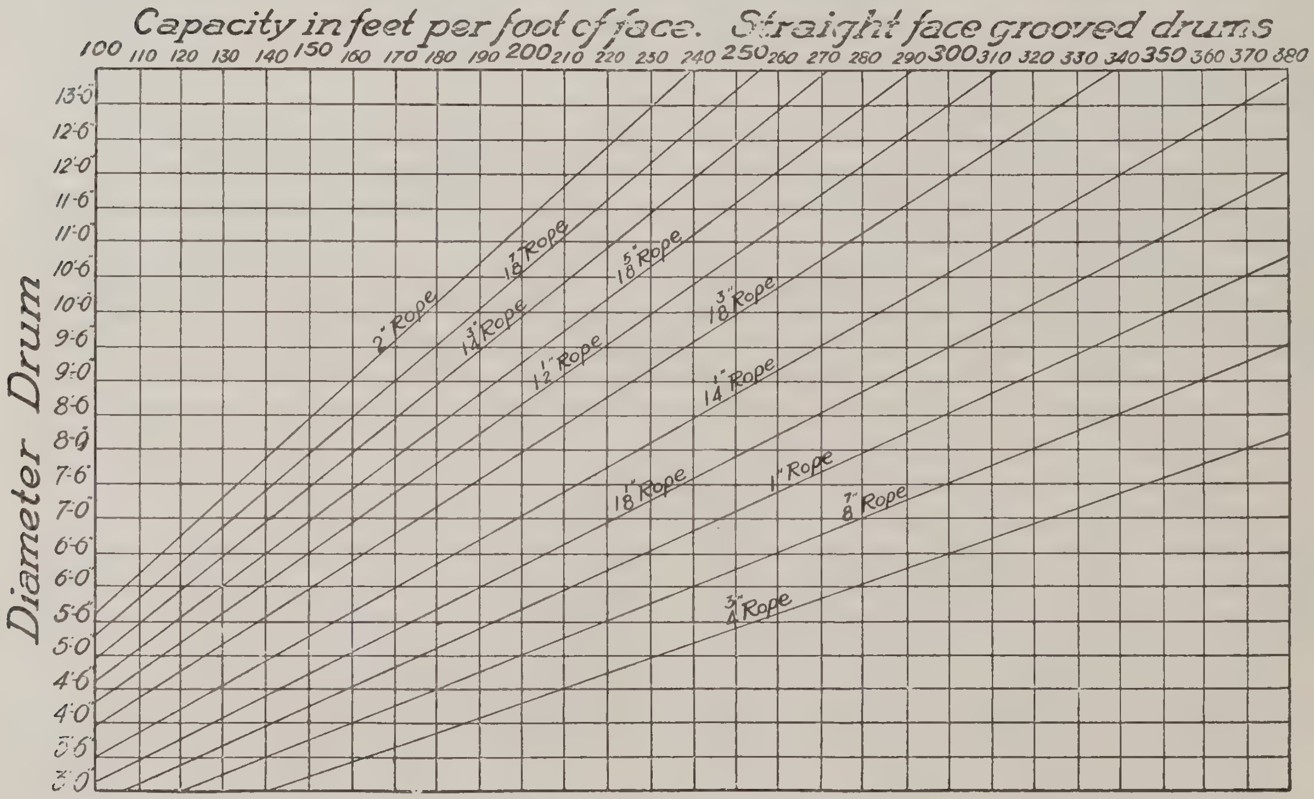
Following the horizontal line at 600 until it is intersected by diagonal line representing 8′ 0″ drum; following this line to the upper section until it is intersected by diagonal line representing 48″ stroke; by following the horizontal line to side of chart the rope speed is found to be 1,890 feet per minute.

Courtesy Vulcan Iron Works.

Face of Winding Drum.

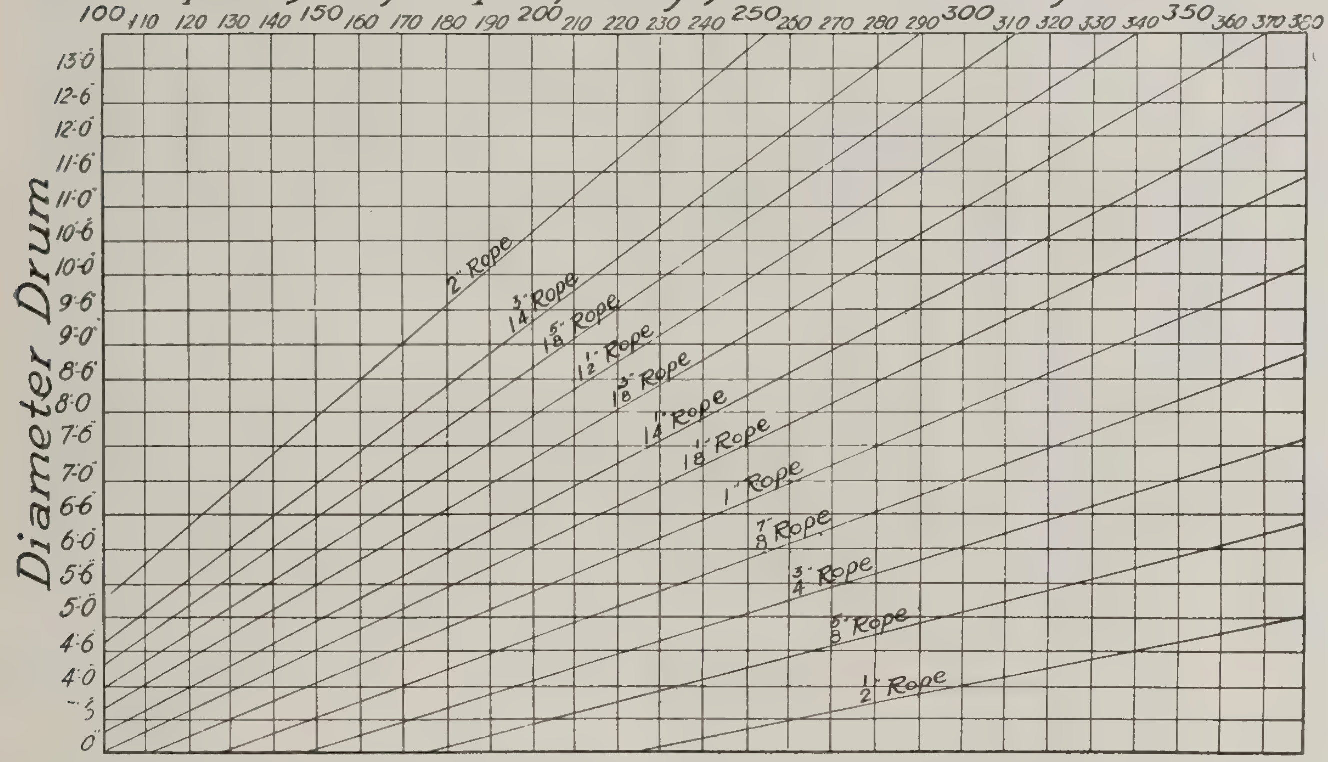
As previously stated, our drum is 8′ 0″ diameter, rope 1-¼″ diameter and shaft 475 feet deep. Refer to the chart marked "Straight Face Grooved Drums." We find that an 8′ 0″ diameter drum will wind 227 feet per foot face. Our drum would therefore have to be, say, 2′ 6″ face, which would allow a sufficient number of grooves at one end of drum for fastening rope.

The charts on straight face drums not grooved, and conical grooved drums would, of course, be used in the same manner as illustrated above. The diameter used for conical drums, however, should be the mean diameter.

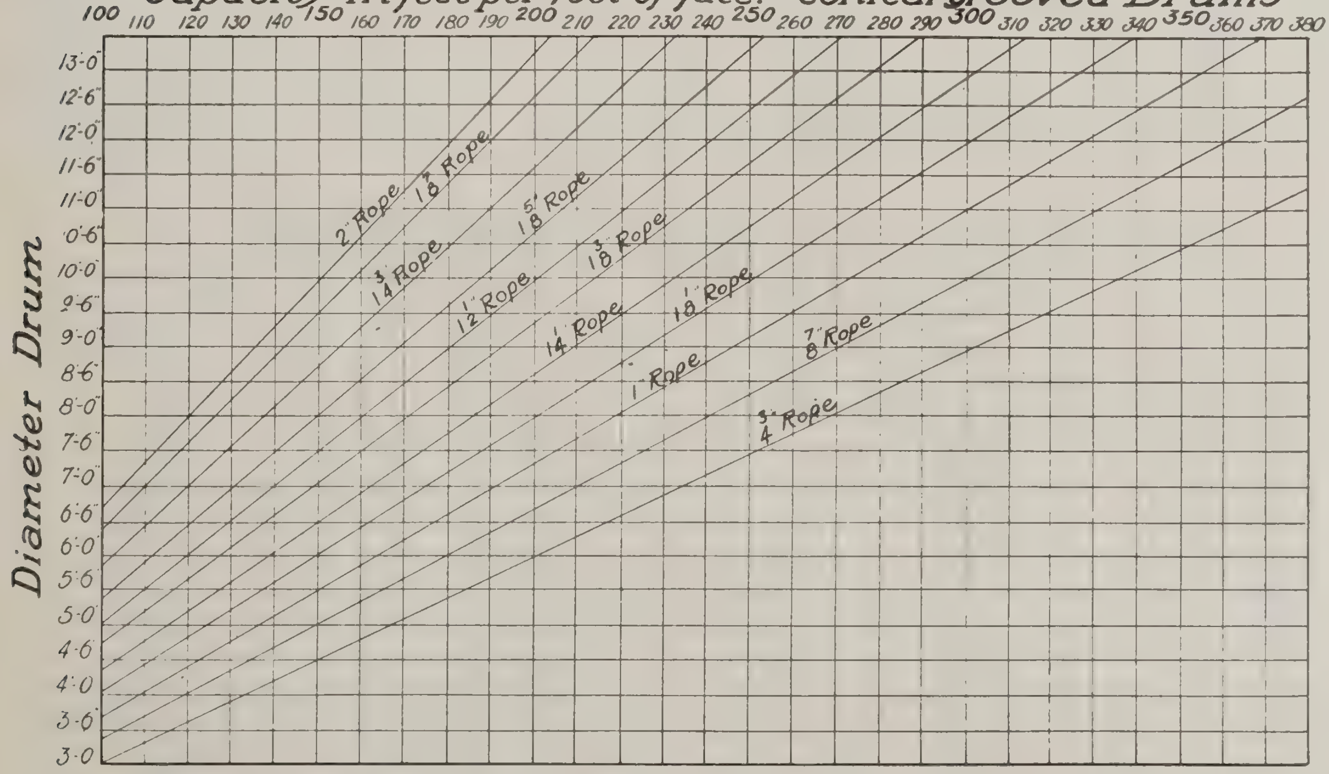


Courtesy Vulcan Iron Works.

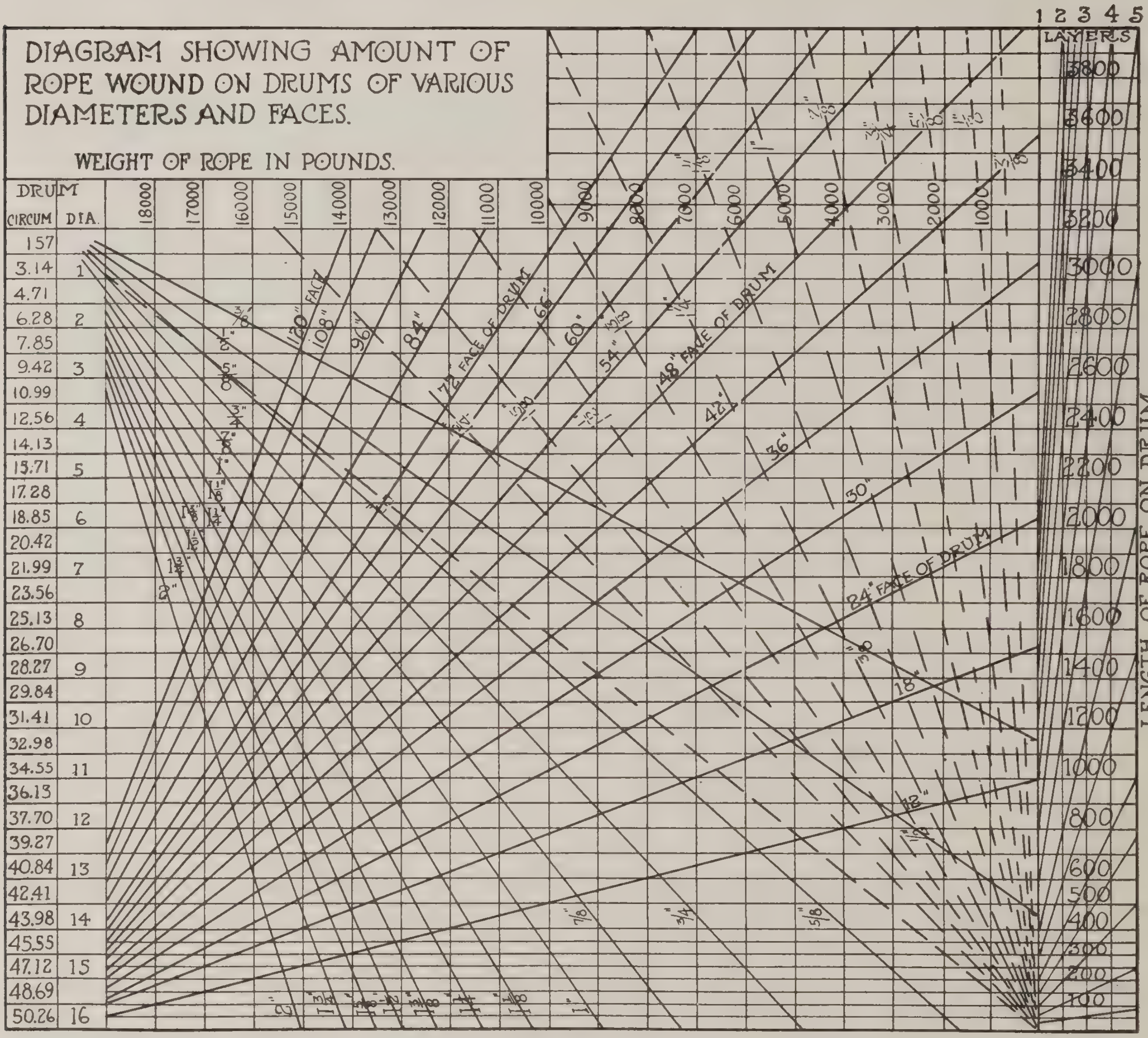
Capacity in feet per foot of face. Drum not grooved



Capacity in feet per foot of face. Conical grooved Drums



Courtesy Vulcan Iron Works.



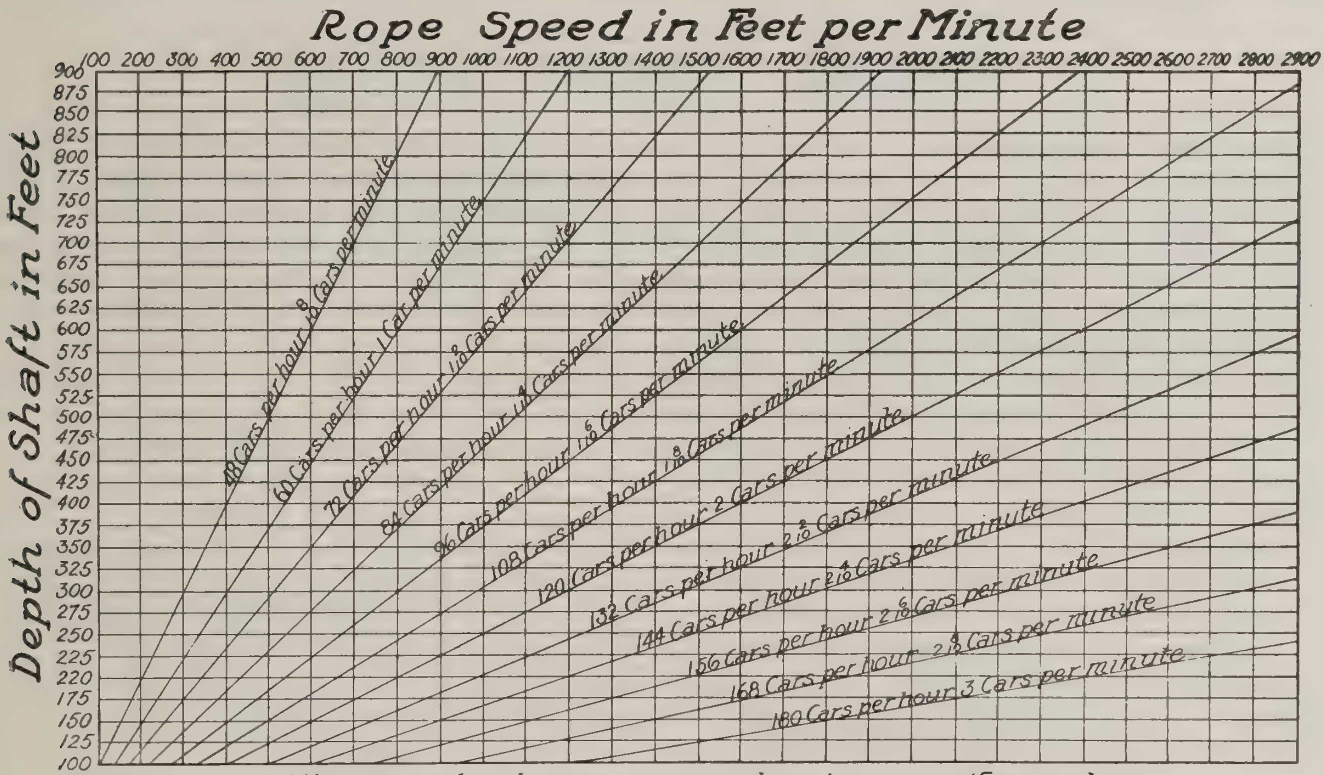
Courtesy Vulcan Iron Works.

Tension on Wire Rope for Incline Planes

At 90°	the tension on rope is	2,000	lbs. for 2,000 lbs. load.
“ 80°	“ “ “ “ “	1,970	“ “ “ “ “
“ 70°	“ “ “ “ “	1,880	“ “ “ “ “
“ 60°	“ “ “ “ “	1,732	“ “ “ “ “
“ 50°	“ “ “ “ “	1,552	“ “ “ “ “
“ 45°	“ “ “ “ “	1,414	“ “ “ “ “
“ 42½°	“ “ “ “ “	1,350	“ “ “ “ “
“ 40°	“ “ “ “ “	1,286	“ “ “ “ “
“ 37½°	“ “ “ “ “	1,216	“ “ “ “ “
“ 35°	“ “ “ “ “	1,148	“ “ “ “ “
“ 32½°	“ “ “ “ “	1,074	“ “ “ “ “
“ 30°	“ “ “ “ “	1,000	“ “ “ “ “
“ 27½°	“ “ “ “ “	922	“ “ “ “ “
“ 25°	“ “ “ “ “	846	“ “ “ “ “
“ 22½°	“ “ “ “ “	764	“ “ “ “ “
“ 20°	“ “ “ “ “	684	“ “ “ “ “
“ 17½°	“ “ “ “ “	600	“ “ “ “ “
“ 15°	“ “ “ “ “	518	“ “ “ “ “
“ 12½°	“ “ “ “ “	432	“ “ “ “ “
“ 10°	“ “ “ “ “	348	“ “ “ “ “
“ 8°	“ “ “ “ “	278	“ “ “ “ “
“ 7°	“ “ “ “ “	242	“ “ “ “ “
“ 6°	“ “ “ “ “	208	“ “ “ “ “
“ 5°	“ “ “ “ “	174	“ “ “ “ “
“ 4°	“ “ “ “ “	138	“ “ “ “ “
“ 3°	“ “ “ “ “	104	“ “ “ “ “
“ 2°	“ “ “ “ “	70	“ “ “ “ “
“ 1°	“ “ “ “ “	34	“ “ “ “ “

A grade of	1	foot in 100 feet equals	¾°	or 45′
“ “ “	2	feet “ “ “ “	1⅙°	“ 1°-10′
“ “ “	2½	“ “ “ “ “	1½°	“ 1°-30′
“ “ “	3	“ “ “ “ “	1¾°	“ 1°-45′
“ “ “	3½	“ “ “ “ “	2°	
“ “ “	4	“ “ “ “ “	2⅓°	
“ “ “	5	“ “ “ “ “	3°	
“ “ “	6	“ “ “ “ “	3½°	
“ “ “	7	“ “ “ “ “	4°	
“ “ “	8	“ “ “ “ “	4¾°	
“ “ “	10	“ “ “ “ “	5¾°	
“ “ “	12¼	“ “ “ “ “	7°	
“ “ “	14	“ “ “ “ “	8°	
“ “ “	16	“ “ “ “ “	9°	
“ “ “	18	“ “ “ “ “	10 1/10°	
“ “ “	20	“ “ “ “ “	11 1/3°	
“ “ “	23	“ “ “ “ “	13°	
“ “ “	25	“ “ “ “ “	14°	
“ “ “	26¾	“ “ “ “ “	15°	
“ “ “	30½	“ “ “ “ “	17°	
“ “ “	36	“ “ “ “ “	20°	(19°-40′)
“ “ “	46½	“ “ “ “ “	25°	
“ “ “	57¾	“ “ “ “ “	30°	
“ “ “	75	“ “ “ “ “	35°	
“ “ “	84	“ “ “ “ “	40°	
“ “ “	100	“ “ “ “ “	45°	

Courtesy Hazard Mfg. Co.



Allowance for changing cars or dumping same = 15 seconds.

Cars per Hour

Assume that the shaft is 475 feet deep. We have found that the engines in question will give an average rope speed of 1,890 feet per minute, say 1,900 feet. By referring to this chart it will be readily seen that from a shaft 475 feet deep we can get out two car per minute, or 120 cars per hour. This chart is based on an allowance of one quarter of a minute for changing cars and a double compartment shaft.

Courtesy Vulcan Iron Works.

Bending and Safe Working Stresses for Cast Steel Ropes (19 Wires) Running on Sheaves and Drums of Various Diameters.

(Safe Stress taken one-third of Ultimate Stress.)

Size.	Safe stress.	120″		96″		72″		48″		36″		30″		24″	
		Bending	Working	Bending	Working	Bending	Working	Bending	Working	Bending	Working	Bending	Working	Bending	Working
⅜″	3333	283	3050	353	2980	469	2864	698	2635	924	2409	1102	2231	1366	1967
½″	5867	733	5134	913	4954	1212	4655	1800	4067	2376	3491	2829	3038	3495	2372
⅝″	9067	1506	7561	1876	7191	2485	6582	3680	5387	4847	4220	5759	3308	7095	1972
¾″	12933	2534	10399	3153	9780	4173	8760	6165	6768	8101	4832	9609	3324	11807	1126
⅞″	17333	3943	13390	4886	12447	6481	10852	9556	7777	12528	4805	14835	2498		
1″	22667	6059	16608	7528	15139	9937	12730	14614	8053	19113	3554	22589			
1⅛″	28000	8474	19526	10523	17477	13872	14128	20357	7643	26556	1444				
1¼″	33333	11452	21881	14209	19124	18713	14620	27400	5933						
1⅜″	41333	15545	25788	19272	22061	25350	15983	37028							
1½″	48000	19906	28094	24662	23338	32403	15597								
1⅝″	56000	25005	30995	30957	25043	40629	15371								
1¾″	64000	31689	32311	39203	24797	49919	14081								
2″	82667	46285	36382	57183	25484	74795	7872								

By Courtesy of the Lehigh and Wilkes-Barre Coal Co.

WIRE ROPE DATA

Mining Rope Arrangements

For vertical shaft work it is customary to use almost universally the 6x19 construction rope. The cages are usually arranged in pairs so that as one is lowered the other is raised this being known as the balanced hoist system. Two types of hoisting drums are in common use, the flat drum and the conical drum, the latter being designed to give a slower starting speed when the cage is lifted from the bottom of the mine.

The simplest arrangement is for the ropes to pass directly from the drum to two head sheaves carried on a wooden or steel tower, each sheave lined with the center of that part of the drum on which the rope has to wind. It is customary with either the flat or conical drum to attach one rope to the under side of the drum and the other rope to the top of the drum, leaving several turns on the drum when the cage is resting on the bottom of the mine shaft. The names "underwind" and "overwind" are applied to these two ropes.

Conical drums are used more frequently on shorter mine ropes, but unless the smaller end has nearly as large a diameter as would be used for a flat drum, the rope service may not be much better than with a flat drum. It is a debatable point as to which type of drum is the better.

Crucible Cast Steel Hoisting Rope

Standard Strengths, Adopted May 1, 1910

6 Strands—19 Wires to the Strand—1 Hemp Core

Diameter in Inches	Circumference in Inches	Approximate Weight per Foot in Pounds	Approximate Strength in Tons of 2000 Pounds	Proper Working Load in Tons of 2000 Pounds	Diameter of Drum or Sheave in Feet Advised
2¾	8⅛	11.95	211	42.2	11
2½	7⅞	9.85	170	34	10
2¼	7⅛	8	133	26.6	9
2	6¼	6.30	106	21.2	8
1⅞	5¾	5.55	96	19	8
1¾	5½	4.85	85	17	7
1⅝	5	4.15	72	14.4	6.5
1½	4¾	3.55	64	12.8	6
1⅜	4¼	3	56	11.2	5.5
1¼	4	2.45	47	9.4	5
1⅛	3½	2	38	7.6	4.5
1	3	1.58	30	6	4
⅞	2¾	1.20	23	4.6	3.5
¾	2¼	.89	17.5	3.5	3
⅝	2	.62	12.5	2.5	2.5
9/16	1¾	.50	10	2	2.25
½	1½	.89	8.4	1.68	2
7/16	1¼	.30	6.5	1.30	1.75
⅜	1⅛	.22	4.8	.96	1.50
5/16	1	.15	3.1	.62	1.25
¼	¾	.10	2.2	.44	1

We recommend wherever possible that installations of mine hoist ropes be made with as few bends as possible. In case a shaft has to be changed or if the engine room cannot be located, so as to carry the rope, a turn sheave may be used with suitalbe lead and intermediate supporting sheaves to carry the rope.

Plow Steel Hoisting Rope

Standard Strengths, Adopted May 1, 1910

6 Strands—19 Wires to the Strand—1 Hemp Core

Diameter in Inches	Circumference in Inches	Approximate Weight per Foot in Pounds	Approximate Strength in Tons of 2000 Pounds	Proper Working Load in Tons of 2000 Pounds	Diameter of Drum or Sheave in Feet Advised
2¾	8⅝	11.95	275	55	11
2½	7⅞	9.85	229	46	10
2¼	7⅛	8	186	37	9
2	6¼	6.3	140	28	8
1⅞	5¾	5.55	127	25	8
1¾	5½	4.85	112	22	7
1⅝	5	4.15	94	19	6.5
1½	4¾	3.55	82	16	6
1⅜	4¼	3	72	14	5.5
1¼	4	2.45	58	12	5
1⅛	3½	2	47	9.4	4 5
1	3	1.58	38	7.6	4
⅞	2¾	1.20	29	5.8	3.5
¾	2¼	.89	23	4.6	3
⅝	2	.62	15.5	3.1	2.5
9/16	1¾	.50	12.3	2.4	2.25
½	1½	.39	10	2	2
7/16	1¼	.30	8	1.6	1.75
⅜	1⅛	.22	5.75	1.15	1.50
5/16	1	.15	3.8	.76	1.25
¼	¾	.10	2.65	.53	1

Extra Strong Crucible Cast Steel Hoisting Rope

Standard Strengths, Adopted May 1, 1910

6 Strands—19 Wires to the Strand—1 Hemp Core

Diameter in Inches	Circumference in Inches	Approximate Weight per Foot in Pounds	Approximate Strength in Tons of 2000 Pounds	Proper Working Load in Tons of 2000 Pounds	Diameter of Drum or Sheave in Feet Advised
2¾	8⅝	11.95	243	48.6	11
2½	7⅞	9.85	200	40	10
2¼	7⅛	8	160	32	9
2	6¼	6.3	123	24.6	8
1⅞	5¾	5.55	112	22.4	8
1¾	5½	4.85	99	19.8	7
1⅝	5	4.15	83	16.6	6.5
1½	4¾	3.55	73	14.6	6
1⅜	4¼	3	64	12.8	5.5
1¼	4	2.45	53	10.6	5
1⅛	3½	2	43	8.6	4.5
1	3	1.58	34	6.80	4
⅞	2¾	1.20	26	5.20	3.5
¾	2¼	.89	20.2	4.04	3
⅝	2	.62	14	2.80	2.5
9/16	1¾	.50	11.2	2.24	2.25
½	1½	.39	9.2	1.84	2
7/16	1¼	.30	7.25	1.45	1.75
⅜	1⅛	.22	5.30	1.08	1.50
5/16	1	.15	3.50	.70	1.25
¼	¾	.10	2.48	.49	1

Courtesy American Steel & Wire Co.

WIRE ROPE DATA

Mine haulage systems are very widely different one from another, so much so that it may almost be said that there are hardly any two alike. At the same time there are in common use three leading systems known respectively as

1. **Endless Haulage Rope System.**
2. **Tail Rope System.**
3. **Gravity Inclined Plane.**

1. The endless system consists of a wire rope usually 6x7 construction, spliced endless with small cars gripped on to the rope at regular intervals either singly or in groups of two or three. Two kinds of drum driving arrangements are usually employed known as the elliptical and the figure 8 style respectively. The elliptical arrangement is preferable to the figure 8 as the rope in the latter case is subjected to reverse bending on the drums. Suitable slip rings should always be used on drums to equalize the tension of the different winds of rope, and a tension carriage with counterweight is also necessary. Position of engine and driving drums is usually dependent upon the location of pit mouth. Slow speed of about 3 to 4 miles per hour is the average of this system.

2. Tail rope systems consist of two ropes known respectively as head line and tail line, the latter usually being about double the length of the former. Each rope is carried upon a separate drum and it differs from the endless system in that its operation is intermittent and the cycle of operations is for the head line to pull out a trip of about fifty loaded cars at a speed of about ten miles per hour. The time taken for the trip is dependent upon the length of the headline. The tail line is always attached to the rear car of the trip and as soon as the loaded cars have run to the tipple by gravity, an empty trip of cars is pulled back into the mine by the tail line while the head line is at the same time attached to the front end of the train. The train of loaded cars or empty cars as the case may be, is thus always under perfect control whether coming from the mine or returning to it.

Plow Steel
Transmission, Haulage or Standing Rope.

Standard Strengths, Adopted May 1, 1910

6 Strands—7 Wires to the Strand—1 Hemp Core

Diameter in Inches	Circumference in Inches	Approximate Weight per Foot in Pounds	Approximate Strength in Tons of 2000 Pounds	Proper Working Load in Tons of 2000 Pounds	Diameter of Drum or Sheave in Feet Advised
1½	4¾	3.55	82	16.4	11
1⅜	4¼	3	72	14.4	10
1¼	4	2.45	60	12	9
1⅛	3½	2	47	9.4	8
1	3	1.58	38	7.6	7
⅞	2¾	1.20	31	6.2	6
¾	2¼	.89	23	4.6	5
11/16	2⅛	.75	18	3.6	4¾
⅝	2	.62	16	3.2	4½
9/16	1¾	.50	12	2.4	4
½	1½	.39	10	2	3½
7/16	1¼	.30	7	1.4	3
⅜	1⅛	.22	5.9	1.2	2¾
5/16	1	.15	4.4	.88	2¼
9/32	⅞	.12½	3.4	.68	1¾

Crucible Cast Steel Transmission, Haulage or Standing Rope

Standard Strengths, Adopted May 1, 1910

6 Strands—7 Wires to the Strand—1 Hemp Core

Diameter in Inches	Circumference in Inches	Approximate Weight per Foot in Pounds	Approximate Strength in Tons of 2000 Pounds	Proper Working Load in Tons of 2000 Pounds	Diameter of Drum or Sheave in Feet Advised
1½	4¾	3.55	63	12.6	11
1⅜	4¼	3	53	10.6	10
1¼	4	2.45	46	9.2	9
1⅛	3½	2	37	7.4	8
1	3	1.58	31	6.2	7
⅞	2¾	1.20	24	4.8	6
¾	2¼	.89	18.6	3.7	5
11/16	2⅛	.75	15.4	3.1	4¾
⅝	2	.62	13	2.6	4½
9/16	1¾	.50	10	2	4
½	1½	.39	7.7	1.5	3½
7/16	1¼	.30	5.5	1.1	3
⅜	1⅛	.22	4.6	.92	2¾
5/16	1	.15	3.5	.70	2¼
9/32	⅞	.12½	2.5	.50	1¾

Extra Strong Crucible Cast Steel Transmission, Haulage or Standing Rope

Standard Strengths, Adopted May 1, 1910

6 Strands—7 Wires to the Strand—1 Hemp Core

Diameter in Inches	Circumference in Inches	Approximate Weight per Foot in Pounds	Approximate Strength in Tons of 2000 Pounds	Proper Working Load in Tons of 2000 Pounds	Diameter of Drum or Sheave in Feet Advised
1½	4¾	3.55	73	14.6	11
1⅜	4¼	3	63	12.6	10
1¼	4	2.45	54	10.8	9
1⅛	3½	2	43	8.6	8
1	3	1.58	35	7	7
⅞	2¾	1.20	28	5.6	6
¾	2¼	.89	21	4.2	5
11/16	2⅛	75	16.7	3.3	4¾
⅝	2	.62	14.5	2.9	4½
9/16	1¾	50	11	2.2	4
½	1½	.39	8.85	1.8	3½
7/16	1¼	.30	6.25	1.25	3
⅜	1⅛	.22	5.25	1.05	2¾
5/16	1	.15	3.95	79	2¼
9/32	⅞	12½	2.95	59	1¾

Courtesy American Steel & Wire Co.

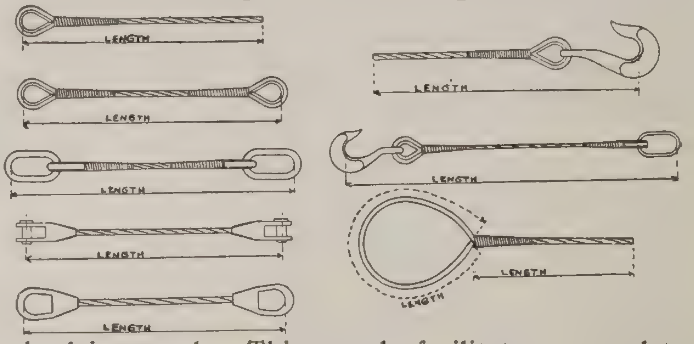
How to Order Wire Rope

State length, size, diameter (or circumference), quality, number of strands, number of wires in the strand, and whether hemp center or wire center is wanted, also whether bright or galvanized is desired, e. g., 750 feet long, 1⅛ inches in diameter, plow steel hoisting rope, six strands, nineteen wires, hemp center, one piece.

If rope is to be equipped with thimbles, sockets, hooks, links, loops or other fittings, state the length from the pull of thimble, socket, hook, link, loop, etc., to end of the rope. Where fittings are to be put on each end, be sure and state the length from pull to pull of fittings.

If in doubt as to the material to be used, the conditions under which the rope operates should be given or a sample of rope that is satisfactory submitted so that the proper quality and construction may be furnished.

If possible, submit a rough sketch with the order, or inquiry showing the size and relative position of the sheaves, together with the figures of maximum load in pounds. This greatly facilitates a complete understanding of the requirements which the rope must fill.



Inspection, Care, Lubrication And Handling Of Wire Rope

As a rule, mining companies carry spare ropes on hand which should be stored in a thoroughly dry place. If they are put in a damp place, or left exposed to the weather, they will be more or less injured, unless the rope is thoroughly lubricated, and even in this case it is far better policy to have the rope well protected.

Hoisting and haulage ropes are shipped on reels and unwinding is a simple matter. If the reel is heavy, a large diameter pipe may be passed through its center, which will then serve as an axis. Each end of the pipe is then rested on a brace, or other support, at such a height that the reel is lifted off the ground and is free to turn about its center. Ropes of shorter lengths are sometimes received in a coil and great care must be taken to prevent kinks in unwinding. The rope should be rolled along the ground like a hoop, and under no consideration should be taken off coil by coil.

A rope should be carefully inspected when it is installed in order to determine whether or not it has been injured in transit, and, moreover, for the purpose of detecting imperfections in manufacture. Manufacturers would much rather be advised of anything of this description than to have the rope installed and complaints made afterwards.

Hoisting ropes should be examined daily, especially where men are brought in or out of the mine. In most states this examination is made compulsory. Frictional wear and corrosion externally, along with abrasion of the wires and deterioration of the core internally, due to use and conditions, are continually taking place. When this wear has progressed to such an extent that the cross sections of the wires are reduced and their strength materially lessened, broken wires begin to appear along its surface. As wearing continues, the number of breaks increases. This is a sure indication of the diminished strength of the rope, since the broken wires are the result of the weakened condition.

As long as the breaks are far apart, little effect is produced on the strength of the rope, since the frictional tenacity is not impaired by a few breaks far removed from each other. But when several breaks occur close together, the strength is much more affected. It will thus be seen that the number of breaks in the rope and the relation they bear to each other provides an index of the safe condition of the rope.

All ropes should be lubricated, and in wet shafts the rope should be well protected from the entrance of moisture. In some instances ordinary black oil is used. This has little or no value, as it does not cling to the surface, penetrate to the core, nor resist the effects of moisture or other damaging elements. An efficient wire rope lubricant must be free from any material that will attack the constituent parts of the rope, must remain soft and pliable under all atmospheric conditions, and must not be subject to evaporation. It must be insoluble in water and must be unaffected by the acids contained in mine water. It must, moreover, have the property of penetration, enabling it to reach every wire and each strand into the core. It must have great adhesiveness and must not peel.

As a general rule, hoisting ropes give out at a point near the socket. As the slack is taken up at the beginning of hoisting there is considerable vibration, and as the length of rope constantly diminishes during the hoist, the effects of this swaying of the rope are concentrated at or about the socket. Crystallization of the wires takes place, and in order to eliminate this weakened section a portion of the rope should be cut off at regular intervals. Wire ropes will always stretch after being put into service, and unless ample provision is made at the cage connections for taking up the increase in length, the excess may have to be taken up on the drum or else the rope cut and re-socketed.

ALLIS-CHALMERS MFG. CO.

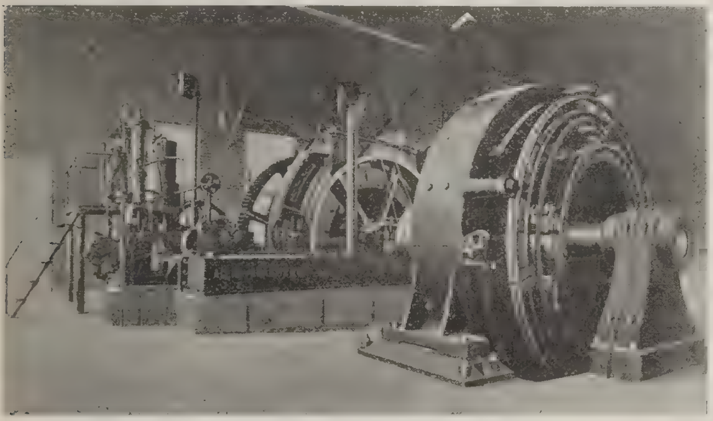
MILWAUKEE, WISCONSIN

Branch Offices in All Principal Cities

Steam and Electric Hoists

Products

Electrical Hoists, Steam Hoists, Power Transmission Machinery, Ventilating Fans, Coal Crushing Rolls, Crushers and Pulverizers, Hoist Cages, Revolving and Shaking Screens.

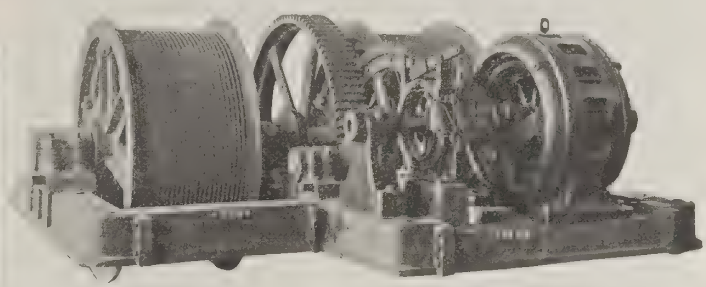


20,300 ft. Rope Pull 1660 ft. per minute Electric Hoist built for Peabody Coal Co., Chicago, Ill.

The Allis-Chalmers Manufacturing Company, having a wider experience than any other manufacturer in the successful design and operation of Mining Machinery, has had an unusual opportunity to obtain a comprehensive knowledge of all operating conditions to be met in hoisting engineering. Being also one of the largest manufacturers of electrical apparatus, its experience in this line has given it a thorough knowledge of the difficulties to be met and overcome in adopting electric power to the operation of hoists.

This Company extends the services of its Engineering Department to recommend the proper type of hoist to be used.

A complete line of special drum motor driven hoists is built in capacities ranging from 2,000 pounds rope pull to 7,000 pounds rope pull and the small double drum hoist 3,500 pounds rope pull and 7,000 pounds.



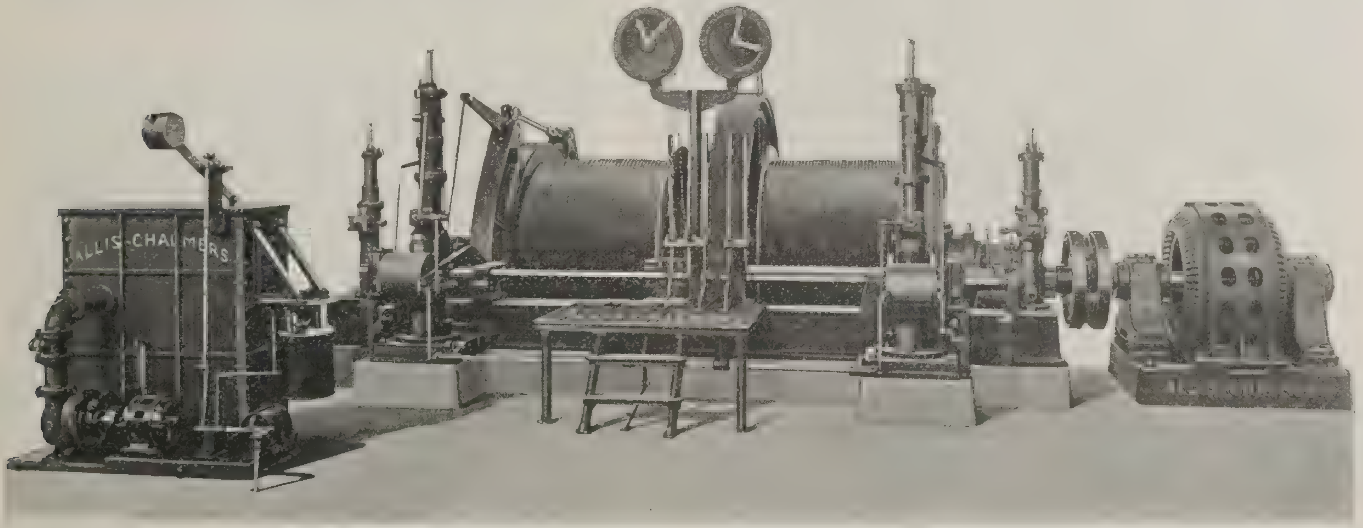
24,000 ft. Rope Pull 375 ft. Rope Speed double drum Automatic Electric Hoist.

The larger hoists are built in capacities to meet local conditions. Consult the Company for further information. Bulletin No. 1445 will be sent on request.

Power Transmission Machinery

This Company manufactures a complete line of Power Transmission Machinery, including shafting of all kinds, pulleys, couplings, hangers, bearings, etc. The material and workmanship used in the building of this class of machinery is of the highest grade throughout. We solicit your inquiries. Send for Catalogue No. 133.

This Company manufactures a complete line of coal crushing rolls, shaker screens, revolving screens, pulverizers, crushers, etc., and solicits inquiries for same. Send for Catalogues Nos. 1412-A and 1411.



17,000 ft. Rope Pull 650 ft. per minute Rope Speed double drum Electric Hoist.

Connellsville Mfg. & Mine Supply Co.

Main Office and Works
CONNELLSVILLE, PA.

Brown-Marx Building,
Birmingham, Ala.

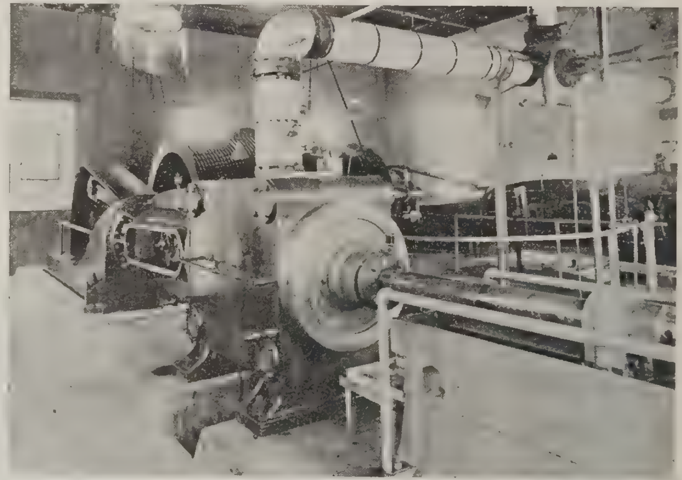
918 Webster Building,
Chicago, Ill.

Designers and Builders of

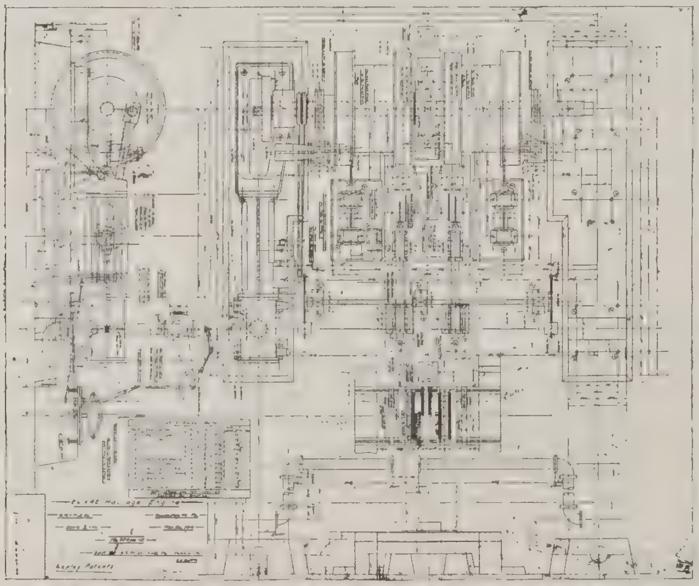
Steam and Electric Hoists

Our Reputation:—Strength—Durability—Service.

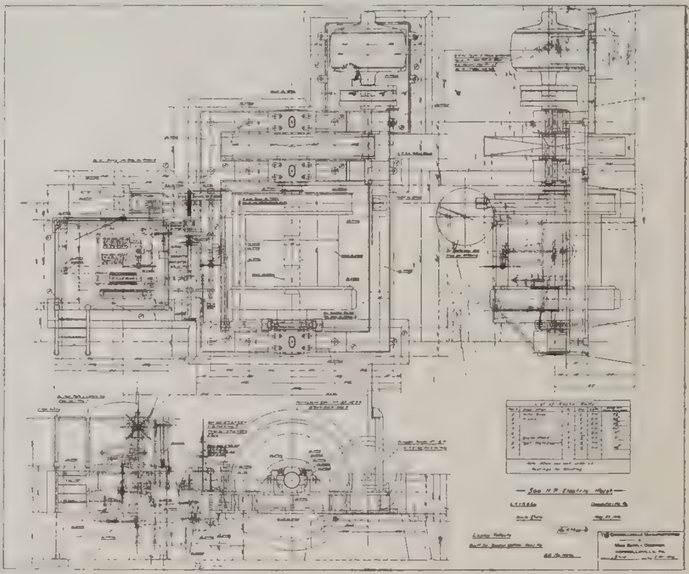
26 x 48" First Motion, Double Conical Drum, Shaft Hoisting Engine, of the four valve Corliss type; equipped with the Lepley Patent Safety Stop Mechanism. Ask for Safety Bulletin No. 88.



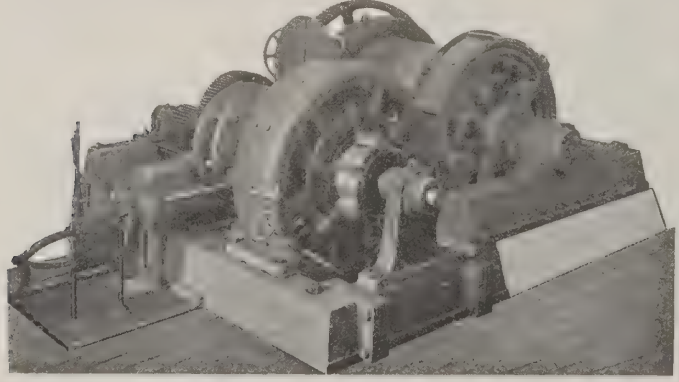
26 x 48" First Motion, Double Conical Drum, Shaft Hoisting Engine. A modern, high class Hoist, embodying all of the best features of design and construction.



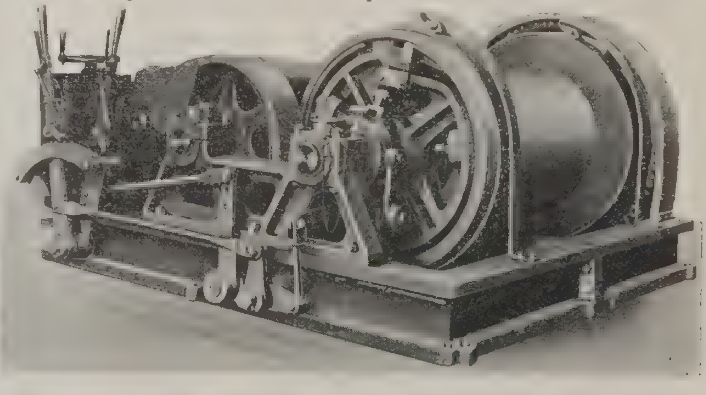
An under-ground installation at the Colonial Mine of the H. C. Frick Coke Co. Being a pair of 26 x 42" Tail Rope Haulage Engines with cast steel sectional drums, steam operated friction clutches and brakes.



A Modern, single, friction drum, 500 H. P. Slope Hoist installed at one of the mines of the Consolidation Coal Co., in Penna., equipped with all of the latest automatic, regulating and safety features. Write for particulars.



A 500 H. P. single, friction drum, electric Slope Hoist, installed in one of the mines of the Washington Coal & Coke Co., at Star Junction, Pa., equipped with the Lepley Internal Expansion Band Friction Clutch, hand operated. Ask for Bulletin No. 86.



Our standard type of single friction drum Entry Hoist for 50 to 75 H. P. motors. Built in many sizes and equipped with the Lepley Patent Internal Expansion Band Friction Clutches, hand operated, double brakes and steel cut gears.

Favor us with your Hoist Problems and they will have immediate and intelligent attention.

The Connellsville Mfg. & Mine Supply Co.

Birmingham, Ala.
Brown-Marx Building,

Main Office and Works
CONNELLSVILLE, PA.

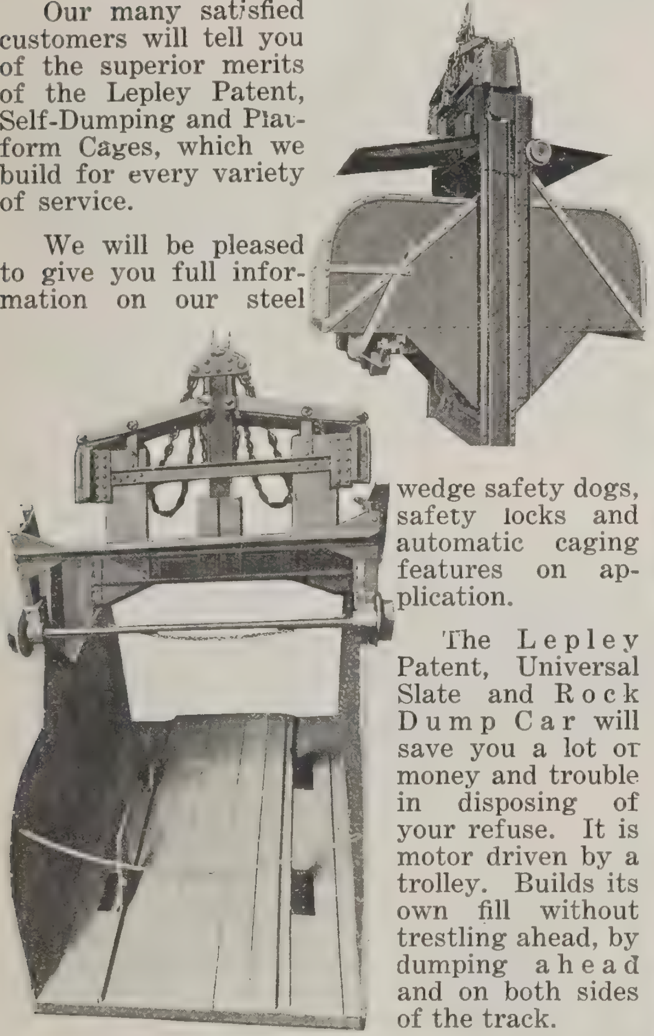
918 Webster Building,
Chicago, Ill.

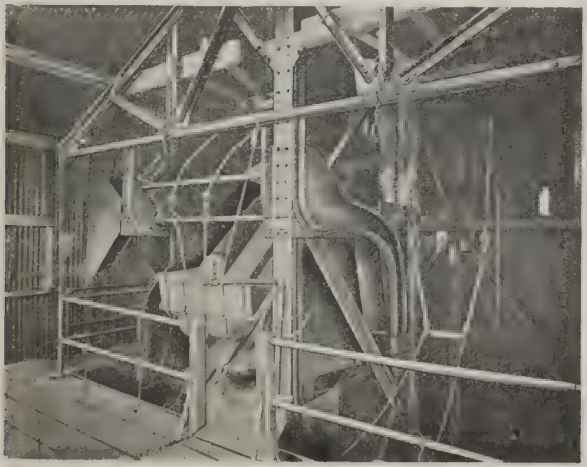
The Cage Builders and Manufacturers of Special Mine and Coke Works Equipment

Our many satisfied customers will tell you of the superior merits of the Lepley Patent, Self-Dumping and Platform Cages, which we build for every variety of service.

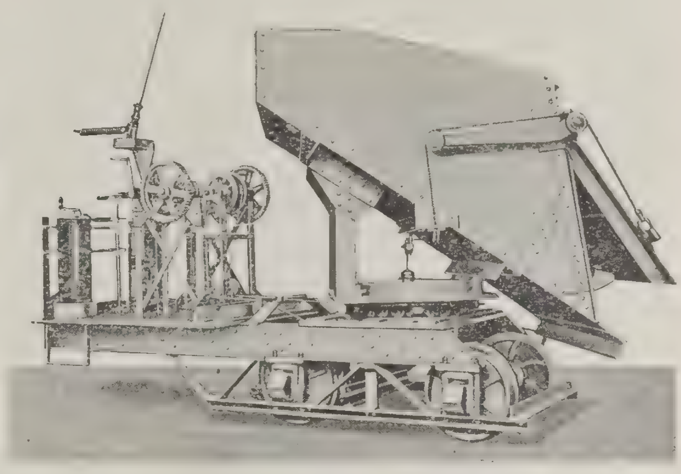
We will be pleased to give you full information on our steel wedge safety dogs, safety locks and automatic caging features on application.

The Lepley Patent, Universal Slate and Rock Dump Car will save you a lot of money and trouble in disposing of your refuse. It is motor driven by a trolley. Builds its own fill without trestling ahead, by dumping ahead and on both sides of the track.

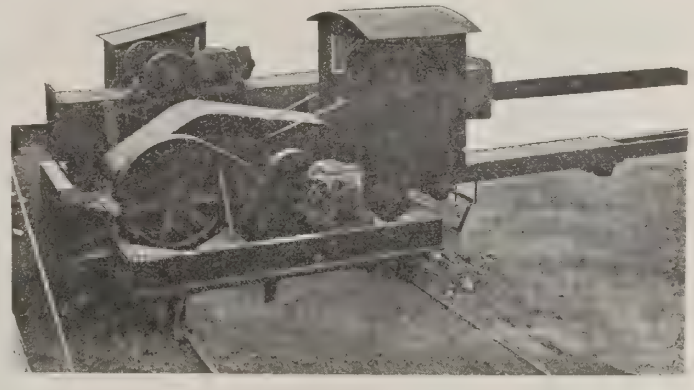




We build this in 5 and 10 ton capacities. Ask for our Bulletin No. 81 for full particulars.



We design and build a full line of machinery for operating rectangular coke ovens, consisting of the Lepley Patent Coke Pushing, Leveling and Conveying Machines.



This cut shows a side view of our long ram Pushing and Leveling Machines on the yard of the W. Harry Brown Coke Plant near Brownsville, Pa. The Conveyor is on the opposite side of the ovens and not shown. These three machines have a record of serving 125 rectangular ovens daily for two years without losing an oven.

Our customers look upon us as leaders in these lines.

If interested, will be pleased to furnish you full information upon application.

CHERRY TREE MACHINE COMPANY

CHERRY TREE, PA.

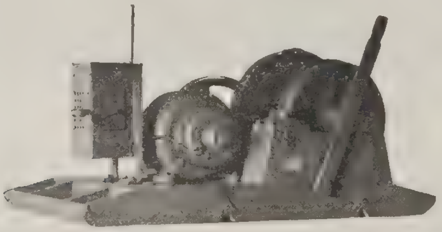
Manufacturers of:—

- "Brownie" Hoists.
- Mine Cars of all descriptions.
- "Ring Oiler" Mine Car Wheels.
- Rope Sheaves, Grate Bars and Brake Shoes.
- Mining Machine Parts.
- General Iron and Brass Castings.

THE BROWNIE HOIST

A portable Electric Hoist built especially for hauling mine cars in Rooms or Headings that are on a grade, or for hoisting light loads.

Use:—To eliminate, what is very often a just cause for complaint by the Miner;—the pushing of Mine Cars on heavy grades.



Specifications:

Rope Drum—Capacity 1000 ft. of 3/8″ or 700 ft. of 1/2″ wire rope.

Motor—Any standard make AC or DC can be furnished. Standard equipment is a 5HP—30-minute rating series—shunt elevator type motor.

Gearing, Etc.—Double reduction spur gears, cut forged Steel pinion. Automobile type band brake.

Dimensions—Width 30″, Length 60″, Height 28″, Weight 1400 lbs.

Performance

The Brownie Hoist will give a rope pull of 1500 pounds at a speed of 125 feet per minute.

ELECTRICAL EQUIPMENT

We are representatives for and can furnish expert engineering advice on:

- Crocker-Wheeler Co. Motors and Generators.
- Detroit Fuse & Mfg. Co.—Enclosed Switches.
- Stimple & Ward Co.—Electrical Repairing.

Sales Engineers for:—

- Small Motors.
- Electrical Repairing.
- Automatic Controllers.
- Enclosed Switches.

MINE CARS

Kinds:—Wood or composite, according to design submitted.

Trucks:—We recommend our "Cherry Tree" riveted bar truck with boxings. It is as light as possible, consistent with strength and assures permanent alignment of the axles.

Wheels:—We recommend our Special "Ring Oiler." The Oil ring is cast inside the oil reservoir and rides on the hub, feeding oil to the axle through an opening in the inner hub. This system of oiling assures continuous lubrication and greatest economy of lubricant. All wheels are made from special analysis iron, and are deeply chilled and carefully annealed.

CASTINGS

We make a specialty of all kinds of Iron or Brass Castings for mine use, such as Brake Shoes, Grate Bars, Frogs, Door Liners, Sheaves, Gears, etc., and are able to offer prompt and careful service on all special machine parts or repair work.

The sheave and base illustrated is a special design suited particularly for use with the "Brownie" Hoist.

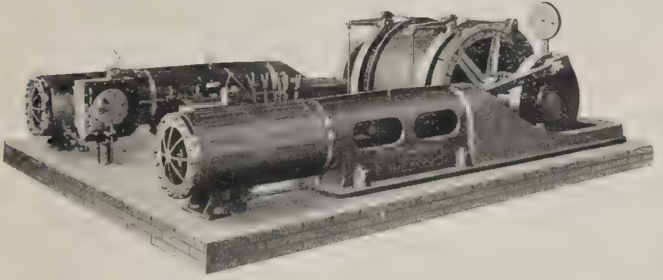
CRAWFORD & McCRIMMON CO.

Established 47 Years.

BRAZIL, INDIANA.

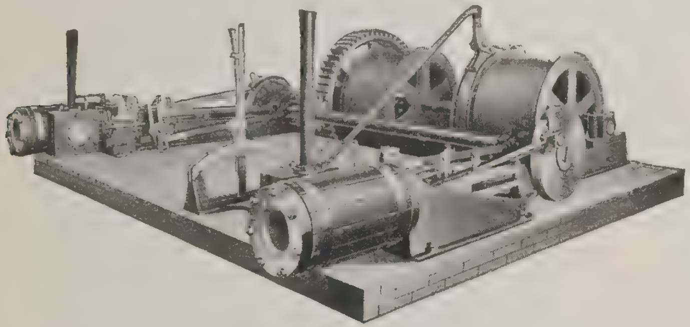
HOISTING AND HAULING ENGINES, FANS, PUMPS AND ELECTRIC HOISTS

New Type Heavy Duty Steam Hoist

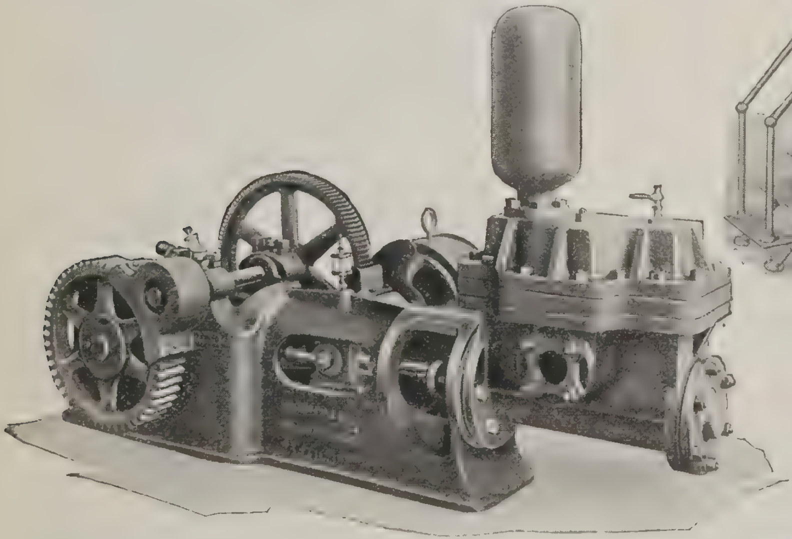


This is the big engine for big work. Has more than a dozen new features, including the stationary links. (Ask the engineer about this). One-piece Bed, Steel Drums, New and Reliable Steam Brake and Reverse, Non-Stick Automatic Throttle.

Geared Hoists

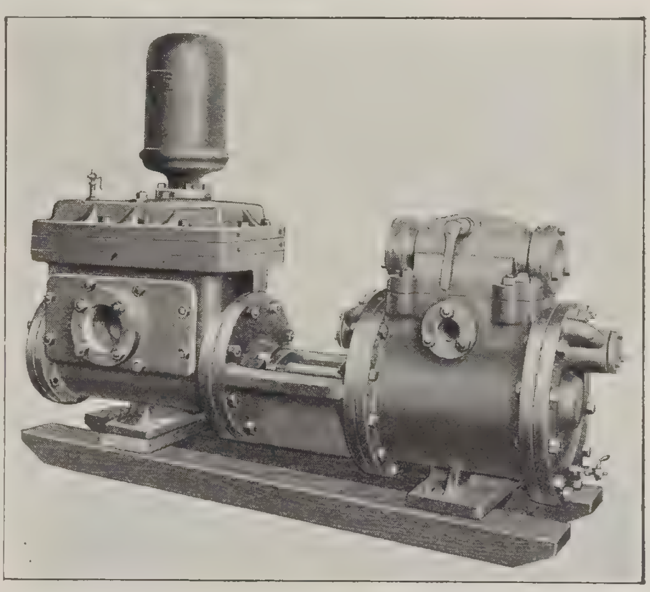


Ask for bulletins. Ask for list of American and foreign users.



Electric Pump. Semi-Steel Cut Gears. Massive Strength. Improved Design.

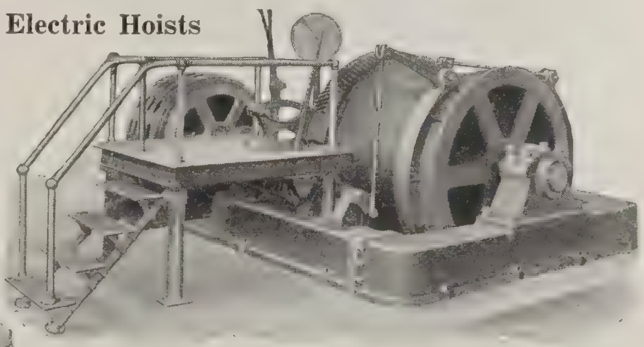
Modern New Daylight Shops
100,000 sq. ft. floor space. New machine tools and equipment. All standardized work.



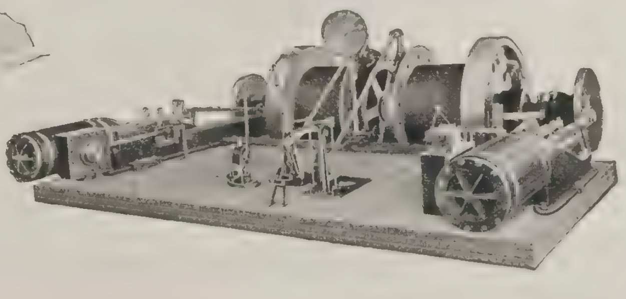
The Lead Lined Acid-Proof Pump. Original and only builder. Steam and electric.

Not an ordinary pump, and not a "price pump." Best guaranteed pump value offered and proven. Numerous companies use as many as a dozen. Learn why.

Electric Hoists

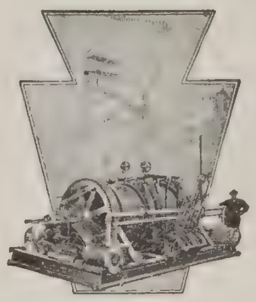


Improved Type Friction Clutch Hoists



S. FLORY MANUFACTURING CO.

Modern Mine Hoists
Steam--Electric--Air



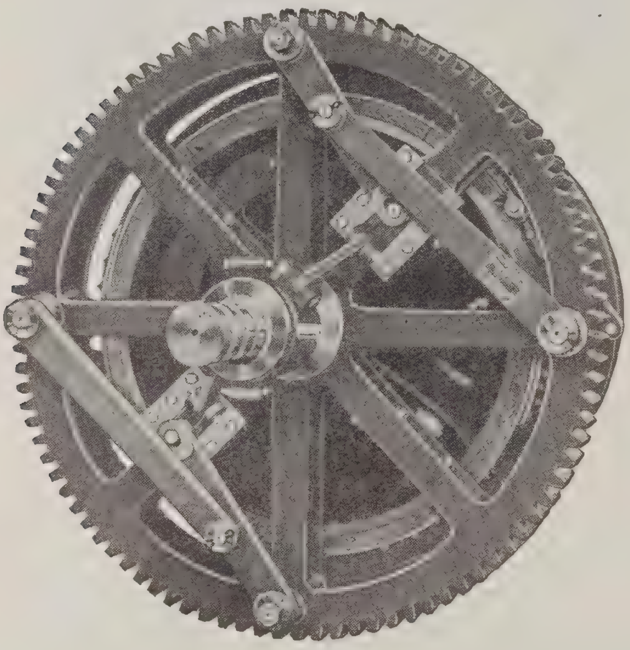
General Office and Works
Bangor, Penna.

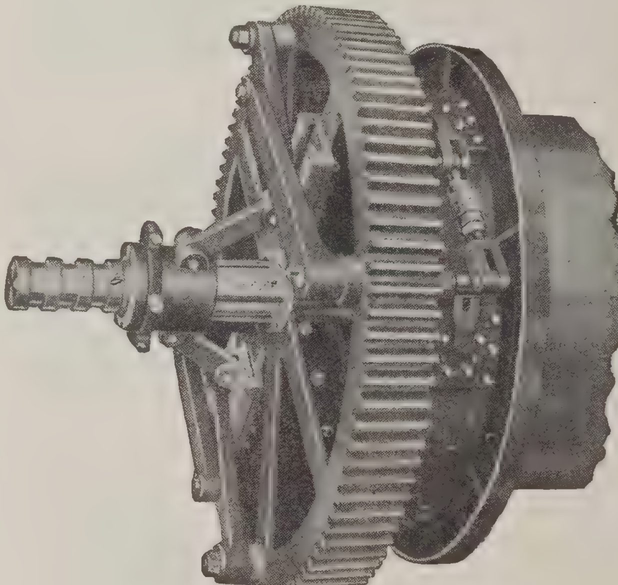
New York Office
95 Liberty St.

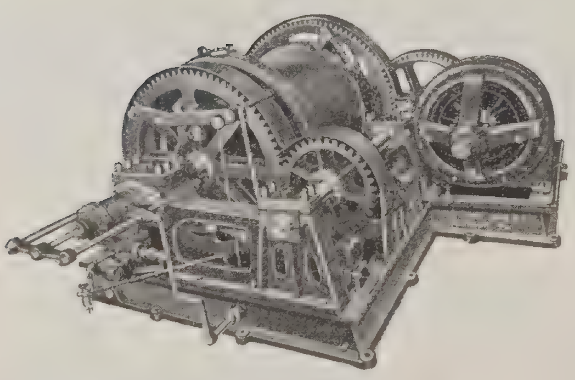
Since 1878 we have manufactured Mining Hoists to meet all conditions and requirements, using Cone and Band Friction, operated by steam, air or hand. Wood or Asbestos Brakes operated by steam, air or hand. The **Flory Hoist** has never failed. Our guarantee goes with every hoist. Give us an opportunity to submit our prices before you buy.

The Werner (Patented) Band Friction

A distinctive feature. Used only on **Flory Hoists.** The Werner Band Friction transmits its load directly from the gear to the Friction Ring on the Drum, thereby eliminating all tortional stress in the Drum Shaft. For simplicity, perfect balance, ease and rapidity of operation and maximum efficiency, it is unexcelled by any other type. It has been tested in the hardest slope and cage operations to perfect satisfaction of the users.



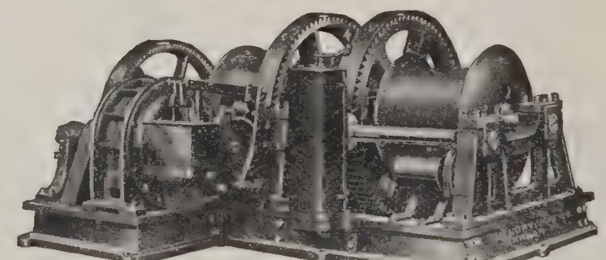




Flory Two Speed Electric Hoist

Two Werner (patented) Band Frictions, operated by air. Air equipment, automatic pump, tank, etc., all mounted on the frame of the hoist.

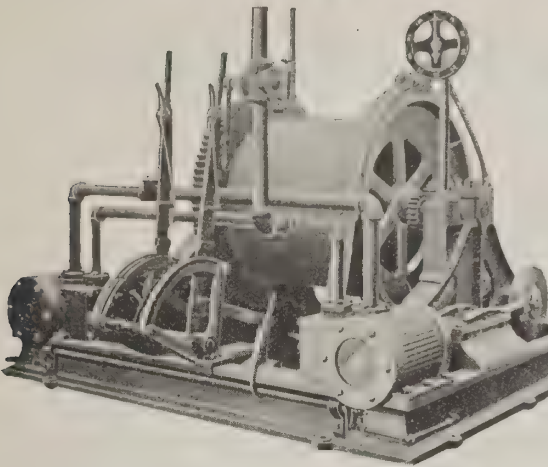
Adaptation—Same as two-speed steam hoist described on opposite page.



Flory Single Reverse Motor, Double Drum Electric Hoist

with solenoid brake, electric overwinding attachment, preventing the operator from overwinding the cage at either end of shaft. Drums keyed to drum shaft. All gears and pinions well guarded, with heavy steel bands. An ideal double compartment shaft hoist.

We can supply your requirements satisfactorily as well as economically.

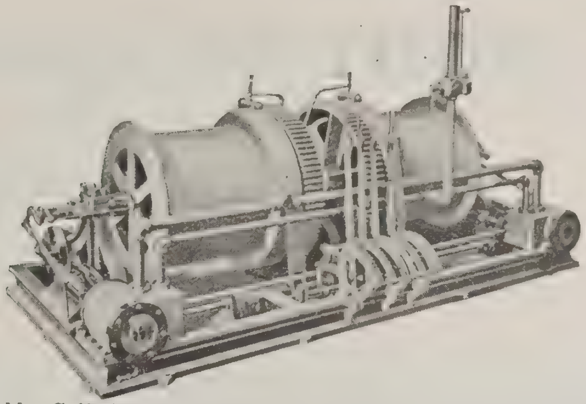


Double Cylinder, Single Drum, Link Motion Engine with Band Brake and Dial Indicator. Especially Adapted for Mines, Incline Planes, Etc.

The drum is keyed fast to the shaft and the hoisting and lowering is done by steam, insuring safety and complete control of all operations. Has one powerful differential brake of wood or asbestos.

TABLE OF SIZES, ETC.

Size Number of Engine,	Horse Power.	Cylinders.		Size of Drums.		Average Hoisting Speed Per Minute, Feet.	Weight Hoisted Single Line Rope, Lbs.	Bed Plate.		Estimated Ship. Weight, Lbs.
		Diam. Inches.	Stroke Inches.	Diam. Inches.	Length Inches.			Width Inches.	Length Inches.	
137b	30	8¼	10	34	30	500	3000	82	85	9500
139d	35	8¼	12	42	38	450	3500	91	90	10800
141f	50	10	12	42	38	600	4500	108	91	11800
142g	50	10	12	48	42	650	4000	108	91	13000
141i	65	11	14	48	42	600	5000	119	97	15500
145j	65	11	14	54	42	650	4500	119	97	16300
146k	75	12¼	15	48	42	550	6500	126	103	19700
147l	75	12¼	15	54	42	600	6000	126	103	21400
150p	100	14	18	60	48	500	8500	143	128	28000
151q	110	14	20	60	60	450	9500	158	132	31000
152r	110	14	20	66	60	500	9000	158	132	33000



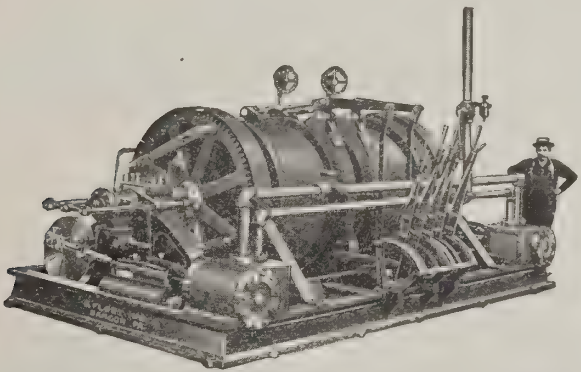
Double Cylinder, Double Friction Drum, Link Engine With Powerful Brakes. Special Adaptation: Double Track Inclines, Double Shafts in Mines and Tail Rope Haulage.

The drums being loose on the shaft, when not in gear, gives them absolute independence of each other in action.

The advantage of this style of engine for Tail Rope Haulage is at once apparent, one drum being thrown into gear winds up the cable while the other, being loose on the shaft, unwinds, and by reversing the engine the opposite winding and unwinding takes place.

TABLE OF SIZES, ETC.

Size Number of Engine.	Horse Power.	Cylinders.		Drum		Average Hoisting Speed Per Minute, Feet.	Weight Hoisted Single Line Rope, Lbs.	Bed Plate		Estimated Ship. Weight, Lbs.
		Diam. Inches.	Stroke Inches.	Diam. Inches.	Length Inches.			Width Inches.	Length Inches.	
239	30	8¼	10	34	30	500	3000	146	85	14200
241	35	8¼	12	42	38	450	3500	162	90	17000
243	50	10	12	42	38	600	4500	167	91	19000
244	50	10	12	48	42	650	4000	172	91	22000
246	65	11	14	48	42	600	5000	194	97	25000
247	65	11	14	54	42	650	4500	194	97	27000
248	75	12¼	15	48	42	550	6500	199	103	30000
249	75	12¼	15	54	42	600	6000	199	103	32000
252	100	14	18	60	48	500	8500	223	125	48000
253	110	14	20	60	60	450	9500	250	132	50500
254	110	14	20	66	60	500	9000	250	132	52500



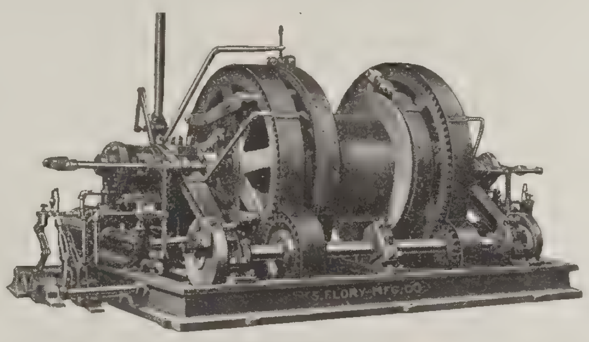
Double Cylinder, Double Band Friction Drum, Link Engine with Powerful Post Brakes and Dial Indicators. Frictions operated by steam thrusts (patented). Special Adaptation: Double Track Inclines, Double Shafts in Mines and Tail Rope Haulage.

For general mining use this engine is especially adapted and recommended for economy and efficiency in operating shafts, etc., as no steam is used for lowering, and, when hoisting, the links may be adjusted with the lever to cut off steam at any point of the stroke, using it expansively in the cylinder.

TABLE OF SIZES, ETC.

Horse Power	Cylinder		Size of Drum		Average Hoisting Speed Per Minute, Feet.	Weight Hoisted Single Line Rope, Lbs.*	Approx. Floor Space.		Estimated Shipping Weight, Complete, Lbs.
	Diam. Inches.	Length Inches.	Diam. Inches.	Length Inches.			Width Inches.	Length Inches.	
45	9	12	37	38	500	4000	92	228	19500
50	10	12	42	38	500	5000	95	234	25000
65	11	14	48	42	550	6000	109	252	38000
75	12¼	15	54	42	600	7000	114	258	46000
100	14	18	60	48	700	8000	128½	280	67000
120	14	20	66	54	700	9000	136	306	78000

* Duty based on 100 pounds steam pressure at cylinders.



2 Speed Hoist, with Werner Patented Band Friction, All Cut Steel Gearing, Non-Reversible.

Specially adapted for heavy planes and slopes, drag line excavators, car pulls, tipples, switch backs, and general heavy duty hoisting where the load varries and output counts. Frictions are operated by steam thrusts (patented). Regularly furnished with band brake, wood lined, but can furnish any other type brake. Levers can be assembled on hoist, arranged for remote control.

Note—Duty based on 125 pounds steam pressure at cylinders.

TABLE OF SIZES, ETC.

Horse Power	Cylinders		Size of Drum.		Duty Single Line Rope Pounds.		Speed Feet Per Min.		Approx. Floor Space		Estimated Shipping Weight, Complete, Lbs.
	Diam. Inches.	Length Inches.	Diam. Inches.	Length Inches.	Hoisting	Lowering	Hoisting	Lowering	Width Inches.	Inches. Length	
45	9	12	24	24	3000	6800	600	250	126	92	16000
55	10	12	30	28	3800	8000	650	275	132	95	20000
65	11	14	42	30	4500	9000	700	300	156	109	32000
85	12¼	15	48	36	5300	10000	800	350	168	114	40000
100	14	18	48	42	7000	15000	850	350	186	128½	60000
120	14	20	54	48	7500	16500	850	350	194	136	70000

Use our Patent "Noburn"—"Nowear" brake blocks to eliminate your brake troubles.

ROBT. HOLMES & BROS., Inc.

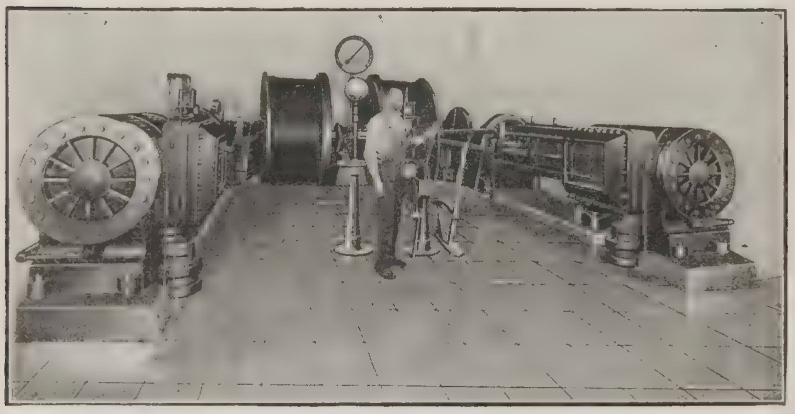
DANVILLE, ILL.

Engineers, Founders and Machinists

"Danville" Hoisting and Haulage Engines

PRODUCTS

Steam and Electric Hoists, heavy duty, first motion with bored guides, steel, cross heads, cranks, links, drums and spiders.



Direct acting or geared from 100 to 1500 H. P.

We use the Beech balanced valve.

All types of Geared, Steam and Electric Haulage and Winding Engines.

Iron and Steel Cylindrical and Conical Hoisting Drums.

Walker's Patent Haulage Drums.

Halbert's Patent Self-Dumping Cages.

Plain Cages, single and double deck.

Holmes' Patent Shaker Screens with single eccentric drive for each section.

Gravity Screens, all types.

Chutes, Straight and spiral

Holmes' Patent End Loading Telescoping Chutes, box type, full or half elbow, adaptable to the loading of highest and lowest cars, without breakage of coal.

Holmes' Patent Weigh Hoppers, with single or double door, steam, air, or hand operated.

Plain and Bicycle Sheaves from one foot to twelve feet in diameter.

Holmes' Car Lift, single and double, will increase your output 25% to 40%. (See opposite page for detailed description.

Iron, Brass and Bronze Castings of all kinds.

Iron and Steel Forgings.

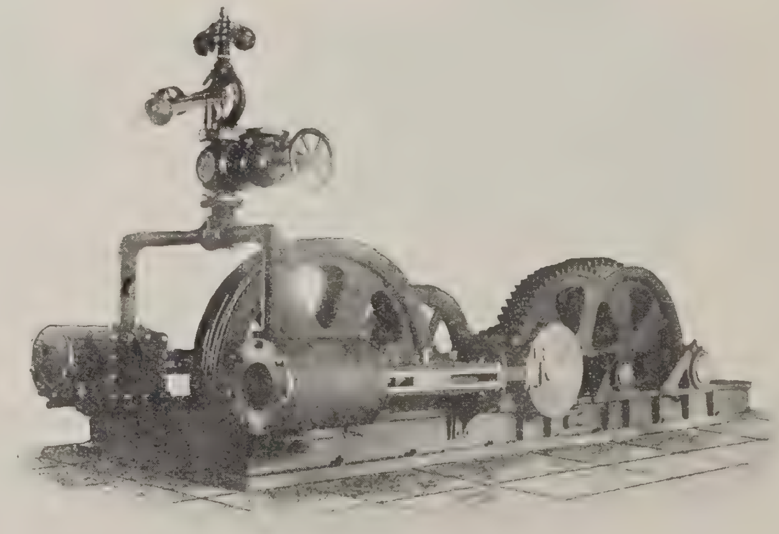
Plate and Sheet Work.

Repairs of all kinds promptly executed.

Cylinders bored and Pistons fitted in position with our portable boring machine. Saves time and trouble and does perfect work.

All kinds of special equipment built to suit your requirements.

Let us figure with you.



ROBT. HOLMES & BROS., Inc.

DANVILLE, ILL.

MANUFACTURERS OF

AUTOMATIC CAR LIFT.

Products

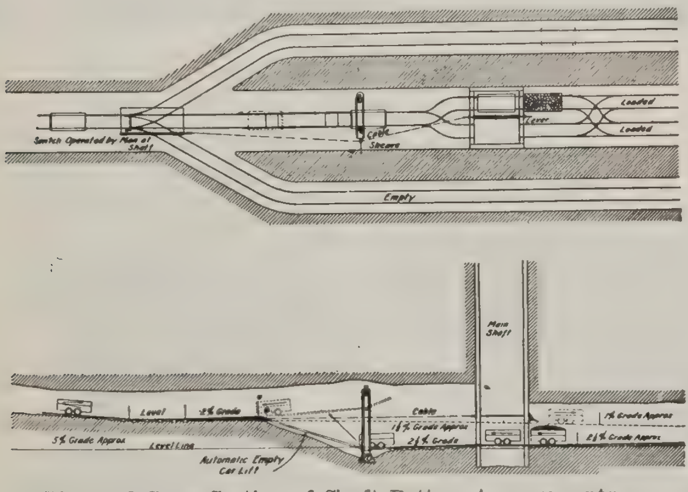
We manufacture Single or Double Automatic Car Lift to handle empty cars in bottom of mines.

Location

The machine is set from twenty to thirty feet from cage landing, opposite load side of shaft. Tracks leading from cage to machine have a fall of three per cent.

Operation

A loaded car is pushed on the cage, bumping off the empty car, which runs down the above mentioned grade until it strikes the forward lever which causes steam or air to be admitted to cylinder by operation of slide valve. Track and car are then elevated to a sufficient height that by gravity the car will be carried far enough back to be reversed and switched to either right or left runaround and thence to main entries, where driver or motorman can hitch on. As the car leaves the movable track it strikes another lever which closes the stream of air ports and opens the exhaust, letting the track down in position for another empty.



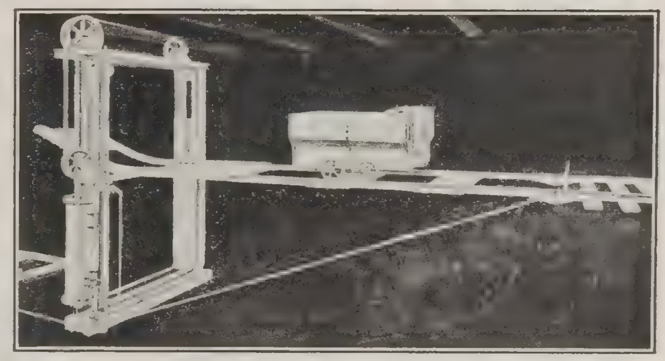
Plan and Cross-Section of Shaft Bottom Arrangements.

The speed of descent of track, and the rapidity of action in lifting cars is controlled by valves which after being adjusted to suit requirements, no further attention to them is required. This machine has a range of from 4 ft. 6 in. to 12 ft. 6 in. net lift above top of cage rails. For other elevations see circular describing No. 1 and No. 3 Lifts, both single and double.

Specifications

The above machine is equipped with 15-in. cylinders, requiring a pressure of 80 to 100 lbs. steam or air.

The feed pipe is 1½ in.



Single Automatic Car Lift and Transfer.

The sheaves are all machined, insuring a long life of the cables.

Cables are ⅝ in. crucible steel, with modern fastenings.

All bearings are large, reducing the wear to a minimum.

All levers are made of cast steel and will last a lifetime.

One ½ pint lubricator for each cylinder is furnished.

The track is made of 60 lb. rails riveted firmly together by ¼ in. steel cross plates and equipped with guard rails.

The frame work is made up of 6 in. I beams and riveted throughout with ⅝ in. rivets.

From four to six cars per minute can be handled with this equipment.

Drawing

The drawings necessary for the erection of machine will be furnished free of charge.

THE AUTOMATIC CAR LIFT is exactly what its name implies. The empty car is taken from the cage and lifted to a height which will allow it to travel by gravity back to main entry, thus entirely eliminating congestion of empties at mine bottom.

The consumption of steam or air is directly proportional to the number of cars handled, consequently there is no waste of power in operation, as the steam or air is used only as each car is raised.

The mechanism is not complicated and does not easily get out of order. Each machine is so constructed that the height of lift may be varied within certain limits, thereby assuring perfect action and proper speed of cars.

The only attention required after installing is an occasional oiling. The workmanship and material are of the best, making a strong and durable machine. Will pay for itself every year. Blue prints mailed upon application and further information cheerfully furnished.

DIAMOND MACHINE CO.

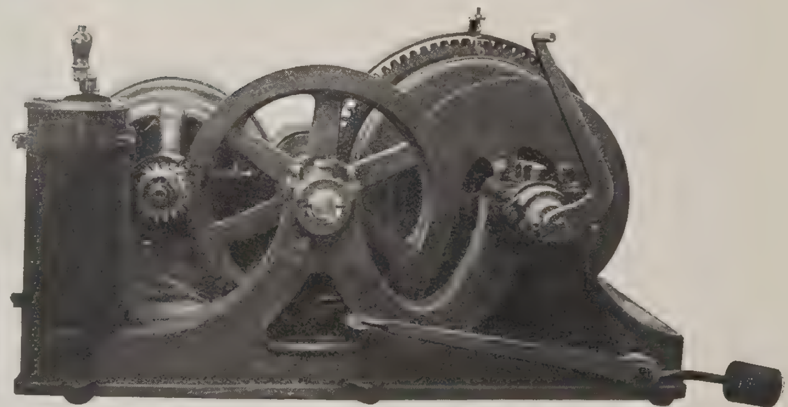
MONONGAHELA, PA.

Manufacturing Engineers

Products

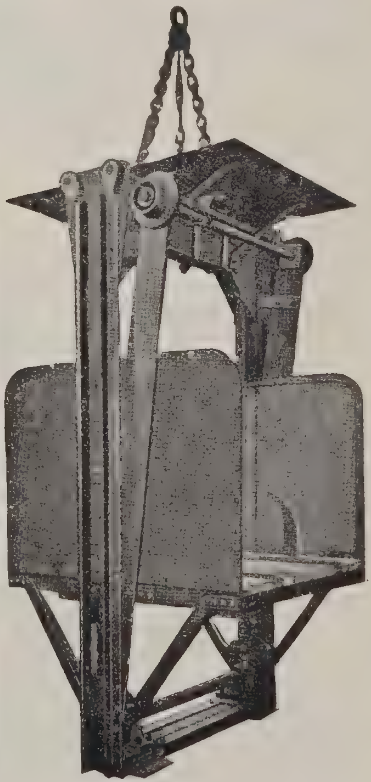
- Electric Hoists.
- Incline Machinery.
- Sheaves—Cast Iron and Bicycle Type.
- Cages.
- Rope Grips for Endless Haulage.
- Miller Automatic Safety Cage Controlled Gates.
- Tipple Equipment.

Four Friction Drum Barge Mover for River Tipples.



Friction and Keyed Drum Hoists for All Classes of Service.

Miller Automatic Safety Cage Controlled Shaft Gate. This Gate is designed to meet the requirements of the Pennsylvania mining code. Write for Bulletin No. 11.



Platform and Self-Dumping Cages.

Lidgerwood Manufacturing Company

96 Liberty Street, New York, N. Y.

Branch Offices
Pittsburgh Philadelphia Seattle Chicago
London, England

Hoists for Every Mine Service

Products

We build Steam Mine Hoists of all types up to 1000 H. P. in size, and electric mine hoists in all sizes and types.

We have been building steam mine hoists since 1873, and were the first hoist manufacturer to build electric mine hoists.

The experience we have gained during this time enables us to meet every requirement of mine haulage work. Great advance has been made in late years in the development of motors, and control equipment. We have kept in close touch with the advancement in this line, and furnish mine haulage hoists equipped with motors and control systems best adapted for the conditions under which they are to work. Every mine hoist we supply is carefully designed for the particular work it is to perform.

We have expert mining engineers who study the conditions at the mine, the work that is to be done, and recommend the suitable hoist.

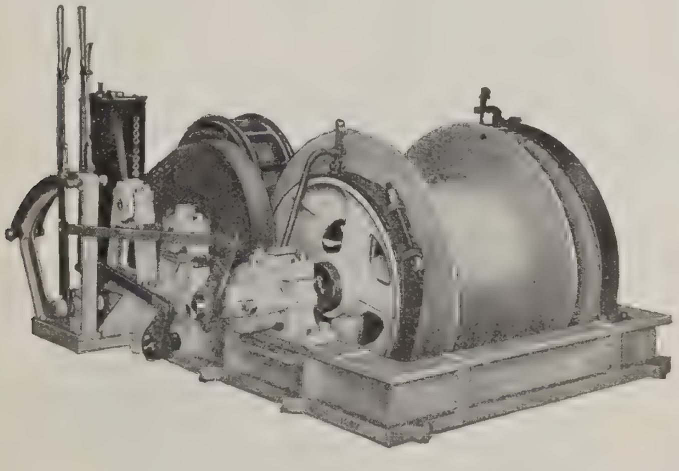


Fig. No. 1247.

New Type Single Friction Drum Hoist especially adapted for supply inclines, inside haulage. When lowering duty is severe we furnish two non-burn lined band brakes.

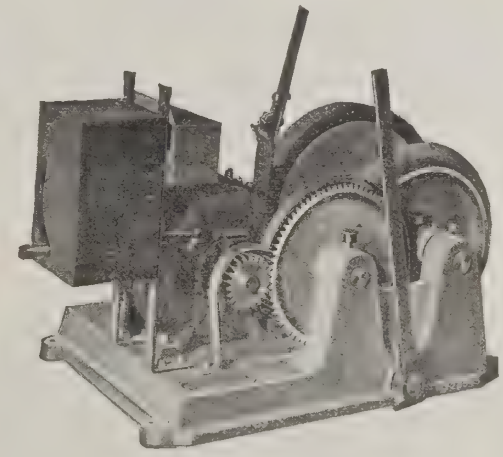


Fig. No. 1235.

Small Mine Hoist built with Direct Current or Alternating Current Motor, coiling 1,000 ft. of ⅜" rope or 800 ft. of ½" rope, adapted for handling cars in rooms, or tipples, supply inclines and various other uses around mines. Same type hoist built with two drums. Carried in stock.

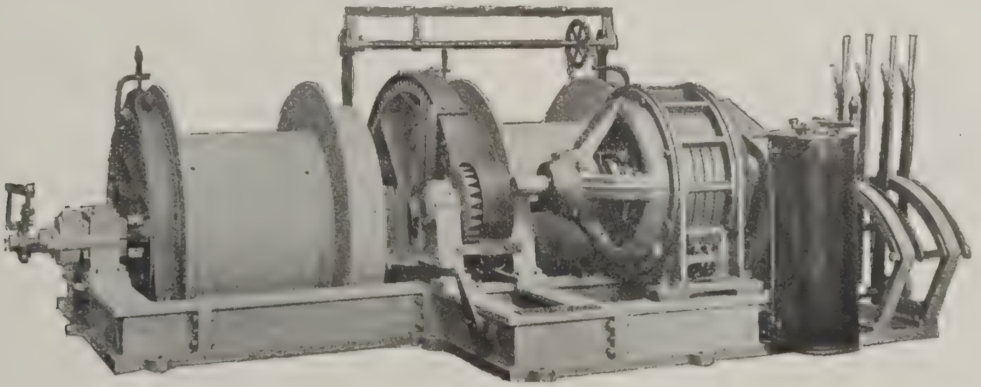


Fig. No. 981.

New Type Double Side by Side Friction Drum Hoist Adapted for Tail Rope Service.

Litchfield Foundry & Machine Co.

Litchfield, Illinois.

Designers and Builders of

Hoisting and Haulage Machinery

Steam or Electric.

"Litchfield" Hoists

Are built in all sizes for every kind and variety of service.

Boiler Steel Shell Drum Faces with Annealed Cast Steel Spiders, Steel Cranks, and Steel Crossheads. All have a very high factor of safety.

Heavy Steam Reverse Auxiliary Engines, with Heavy Links and Reversing Mechanism.

Heavy Steam Brake Auxiliary Engines, with Improved Heavy Brake, and Equipment.

Safety Stops and Overwind Devices.

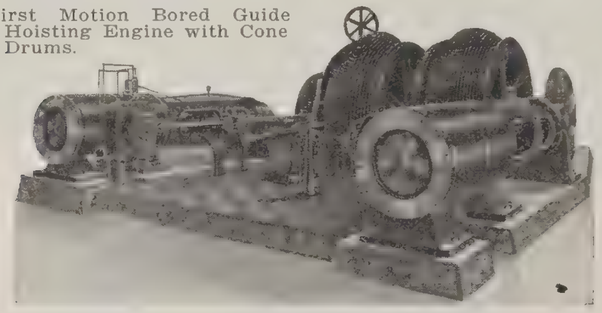
Walker Patent Differential, W. I. Spoke, Haulage Drums. Depression Sheaves, and Rollers.

Morgan Patent Cable Grips, Standard or Extra Heavy Type, and All Haulage Equipment.

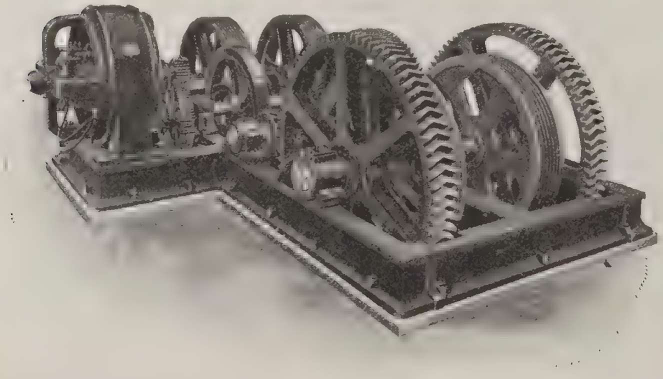
Our Special Machines Pass U. S. Government Inspection.

Special Machinery built to order.

First Motion Bored Guide Hoisting Engine with Cone Drums.



First Motion Tail Rope Haulage Engine With Band Friction Clutches.



Electric Driven, 4 Drum Compound Geared, Endless Rope, Haulage Machine.

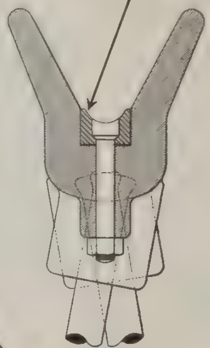
"Litchfield" Bicycle Type Sheaves

(Give Maximum Service). Our method of manufacture eliminates all shrinkage strains.

Made in sizes from 24 inches to 12 feet in diameter.

We offer you the best in design, material and workmanship.

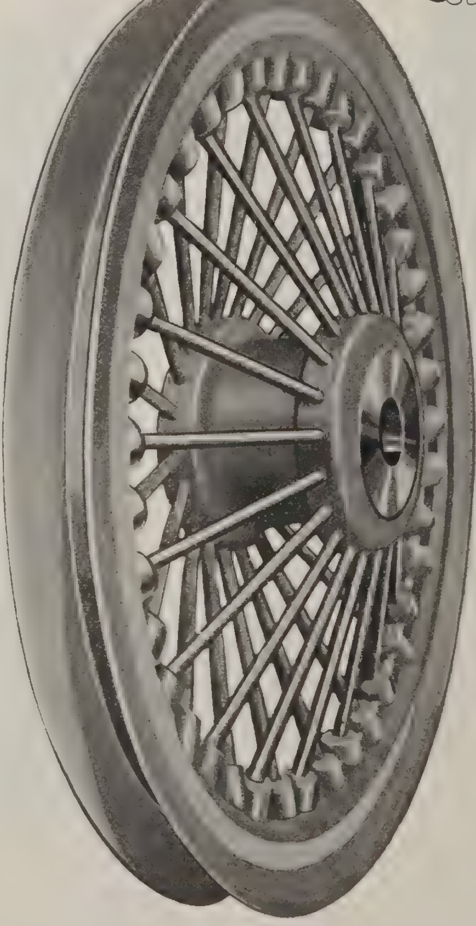
OUR IMPROVED HEAVY DUTY SHEAVES HAVE RENEWABLE STEEL LINING.



Repeat Orders, From the Largest Modernly Equipped Mines, Indicate the Merit of These Sheaves.

Prompt estimates for your requirements.

The Best Is "Safety First."
Quality and Service.

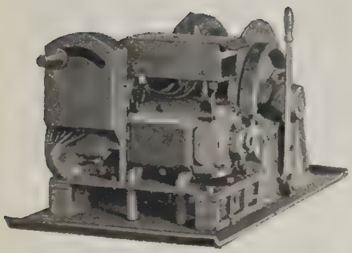


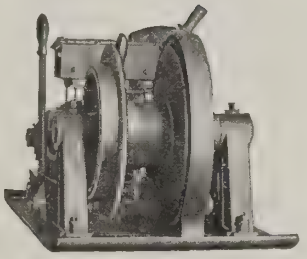
The Pneumelectric Machine Company

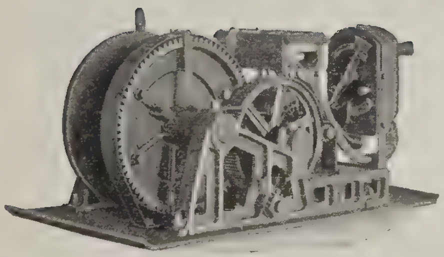
SYRACUSE, N. Y.

Pneumelectric
TRADE MARK

Electric Room Hoist







A small portable electric Hoist that is built especially for hauling mine cars and hoisting light loads in and about coal mines. It can be furnished standard with one or two drums, and in special cases with three drums, the details being the same in all forms.

Uses

Single Drum Hoist—Hauling mine cars on grades in headings or rooms. Hoisting material anywhere around a mine. Hauling cars to or from dumps or tipples.

Double Drum Hoist—Hauling cars by head and tail rope system for short distances. To do the work of two single drum hoists in special cases.

Triple Drum Hoist—For special cases where there are three different duties to be performed. This hoist is especially valuable in the Anthracite Field.

A very important application of the Single Drum Hoist is for the handling of cars from the working faces in headings. It eliminates delays for the men and for the locomotive and helps to speed up heading advancement. The Miner operates the Hoist and the cars are therefore gathered at practically no expense.

Specifications

Rope Drum—Capacity 800 ft. of 3/8″ or 500 ft. of 1/2″ rope.

Motor—Rated hoist capacity, 5 H. P. Can be furnished for any standard voltage, either D. C. or A. C. The D. C. motor is compound wound, thus assuring uniform hauling speed at various loads.

Gearing, etc.—All spur gearing, double reduction cut gears; heavy shafts and bronze bushed bearings; positive clutch; automobile type band brake.

	Width	Length	Height	Weight
Single Drum Hoist	28″	52″	26″	830 lbs.
Double Drum Hoist	44″	52″	26″	1375 lbs.
Tripple Drum Hoist	60″	52″	26″	1920 lbs.

Performance

The Pneumelectric Room Hoist can give a rope pull up to 1800 pounds at a speed of from 200 feet per minute at no load to 100 feet per minute on full load.

VULCAN IRON WORKS

WILKES-BARRE, PA.
NEW YORK CHICAGO

Vulcan Steam and Electric Hoists; Steam, Gasoline and Air Locomotives, Mine Ventilating Fans

Products

Vulcan Electric Hoists and Haulage Machines for Construction Work and Mining; Vulcan First Motion Steam Hoisting and Haulage Engines; Breaker Driving Engines; Geared Engines; Corliss Engines; Stationary Steam Engines with slide, piston or Corliss valves, simple or compound.

Vulcan Steam Locomotives up to 100 tons weight, with saddle tank or separate tender; Vulcan Gasoline Locomotives; Vulcan Compressed Air Locomotives.

Vulcan Mine Fans and other ventilating equipment; Safety Cages and other Mining Machinery.

Vulcan Rotary Kilns, Dryers and Coolers for Nodulizing and Portland Cement Manufacture.

Vulcan-Hamilton Sugar Cane Mills and Gearing and other driving apparatus.

Vulcan Locomotive-Type and Return-Tubular boilers.

Vulcan Steel Stacks.

General Iron Work.

Vulcan Free Engineering Service On All Products

The Vulcan Iron Works is divided into several distinct departments, each of which devotes its entire attention to one line of work. The engineering staff of any of these departments is always ready to assist prospective buyers in the solution of their individual problems. This service is entirely free of cost and obligation.

Vulcan Hoists For Hoisting, Hauling, Winding and Breaker Driving

The experience in the manufacture of such machinery dates back to 1849, when VULCAN IRON WORKS was founded.

There are thousands of Vulcan Hoists in use throughout the world, the bulk being in service, of course, in the American anthracite and bituminous fields.

In order to meet an insistent need for quick deliveries there are several **stock** hoist designs, covering the most usual requirements.

These designs cover most mining needs, but where conditions require special treatment, and immediate delivery is unnecessary, the VULCAN Engineering Department should be consulted freely for a thorough and systematic analysis of the factors influencing the conditions in question.

Special Features

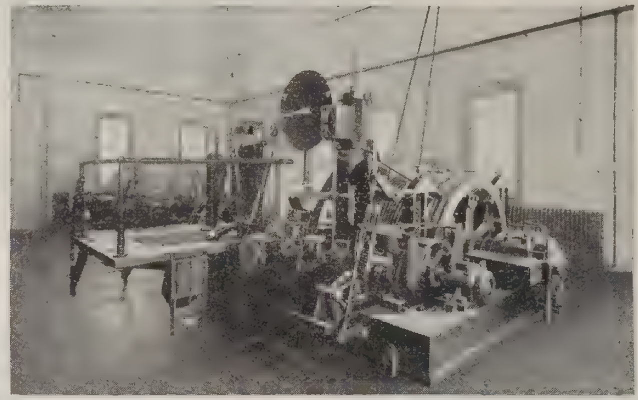
Frames and Pedestals—Heavy, cast- iron box-section. The distribution of metal in the beds is the result of careful calculations—putting the most metal **where it is needed.**

Gears—The metal depends on the particular conditions the hoist is to meet. The teeth are always cut from the blank. Spur gears are generally used in the smaller hoists, while WUEST herringbone cut from a solid blank, are preferable in larger machines. All gears are enclosed.

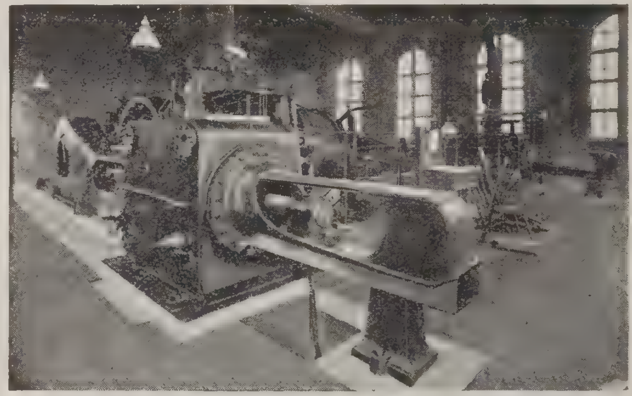
Bearings—They are very generously proportioned. The diameter and length of VULCAN Hoist Bearings give them greater area per unit load than usual practice.

Drums—Are ordinarily made of smooth or grooved cast iron, mounted on cast iron spiders. For extra heavy service cast steel is the proper metal.

Brakes—Steam, electric or air, according to the hoist, with either contracting band or post-shoe application.



One of six hoists made for Pittsburg Coal Co., Montour Mines.

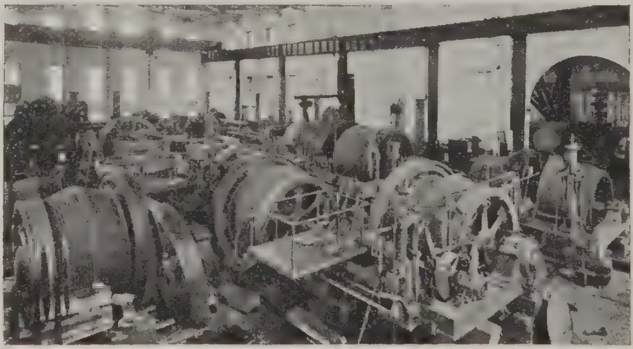


New Corliss-Engine Hoist just installed in Loomis Colliery, Lackawanna Railroad.

The Vulcan Plants

They are big enough to take care of practically any volume of business that may come to them. Their equipment includes machine tools of every character necessary for the complete manufacture of every one of their products.

All the plants have equally good shipping facilities, and with their central locations give purchasers the benefit of excellent freight rates.

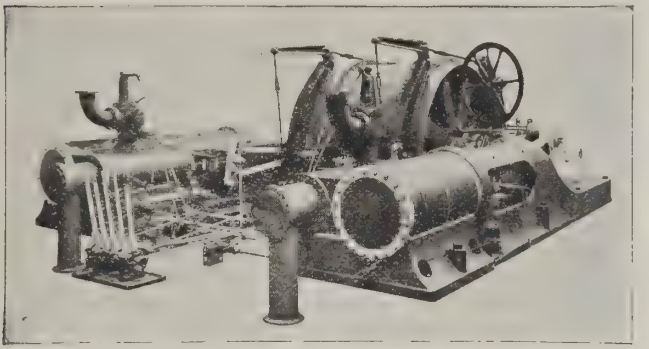


A Part of the Vulcan Hoist Shop.

The Wellman-Seaver-Morgan Company

Cleveland, Ohio U. S. A.
New York Office: 50 Church St
Denver Office: 612 Ideal Bldg.

Steam and Electric Hoists and Hauling Engines



First Motion Hoist.
Maryland Coal Co. of Penna.

Coke Pusher for By-Product Ovens.

W-S-M hoists are built in all sizes for every kind and variety of service. The complete equipment of our two large factories, including steel foundry, forge and extensive machine shops, enables us to handle work of the heaviest character.

Strength and efficiency are the first considerations in designing W-S-M steam or lectric hoists.

A long list of satisfied customers is our best advertisement, to whom we gladly refer prospective customers.

Our electric hoists are equipped with machined herringbone gears encased in oil tight housings, steel drums, weighted steel safety brakes and powerful steel clutches; also the completest possible safety equipment to prevent over-speed or over-winding.

Send for catalogues of our specialties as follows:

Steam and Electric Mine Hoists.

Endless Rope Haulage Plants.

Mine Cages, Skips and Ore Cars.

Rotary Car Tipples.

Hulett Coal-Handling Bridges and Buckets.

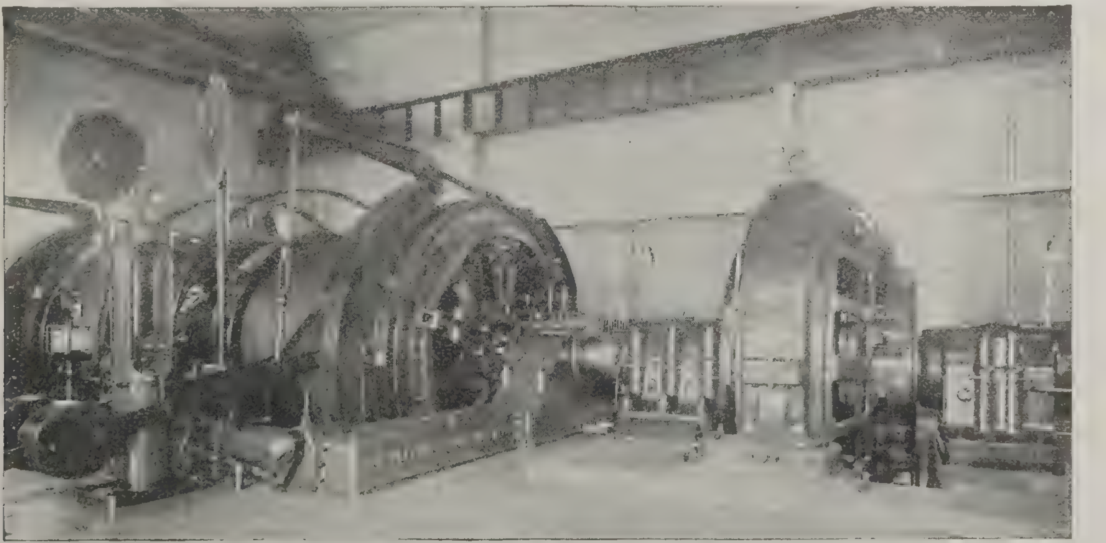
Coal Pier Machinery.

Car Dumpers for Coal Shipment.

Coke Pushers, Coal Leveling, Quenching and Loading Machines for Coke Ovens.

Hughes Gas Producers.

Hydraulic Turbines.



The Largest Electric Hoist in America. North Butte Mine, Butte, Montana.

THE FALK COMPANY

Milwaukee, Wisconsin

Manufacturers of

Wuest Herringbone Gears For All Classes Of Mine Equipment.

AGENTS AND BRANCH OFFICES:

Pittsburgh, W. O. Beyer, 1024 Park Bldg., Pittsburgh, Pa.
New York and New England, M. P. Fillingham, 50 Church St., New York City.
West Coast, F. W. Grimwood, Santa Marina Building, San Francisco, Cal.
Pennsylvania Coal Fields, Vulcan Iron Works, Wilkes Barre, Pa.
Colorado District, Denver Engineering Works Co., Denver, Colo.

The use of Wuest Gears in connection with mine hoists, pumps, tube mills and other mining plant has led to a great simplification in design combined with reduced power consumption and complete absence of shock and vibration with elimination of noise.

These remarkable gears are hobbed from solid blanks on special machines designed and built for this purpose.

Practically all gear problems in connection with mining plant can be met with a single gear and pinion where double and triple trains were formerly used.

Wuest Gears with a reduction ratio of 20 to 1 are not uncommon.

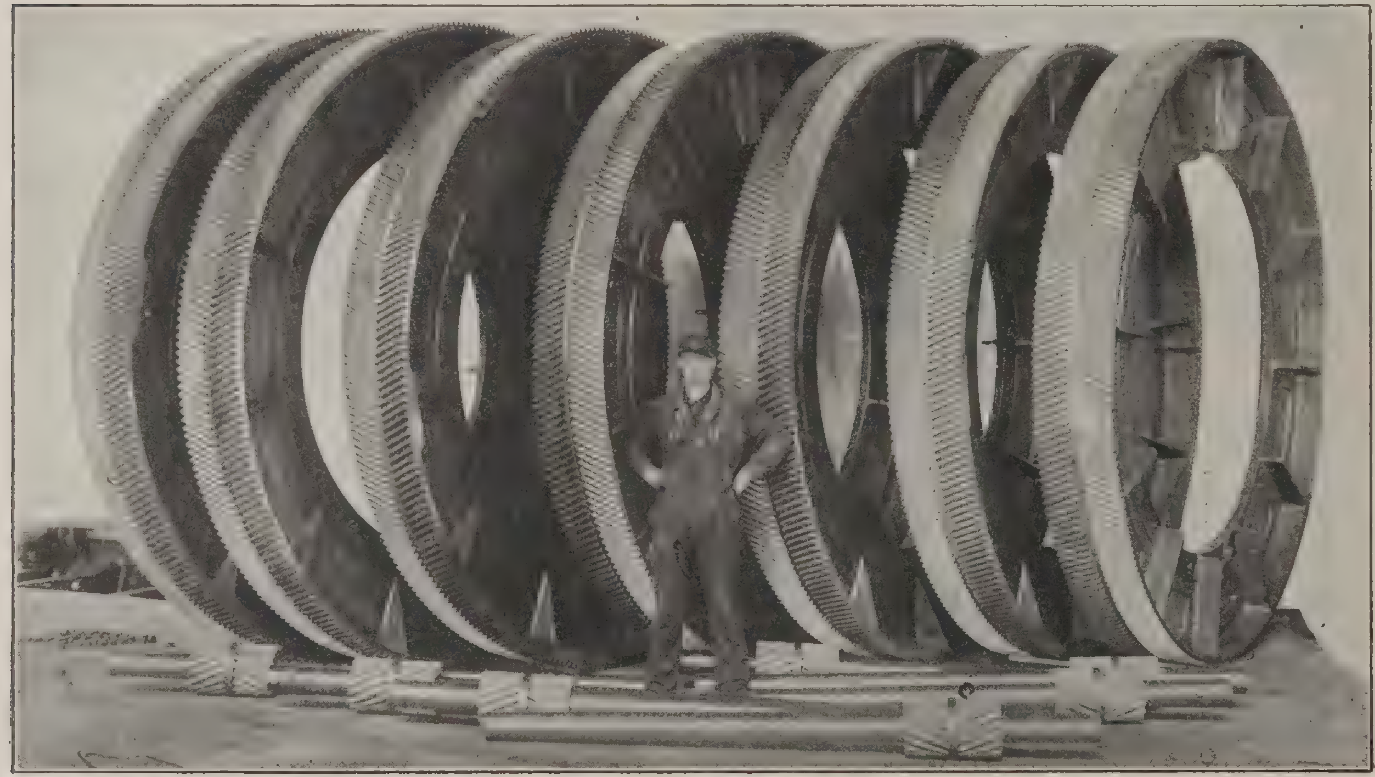
For the electrification of mine hoists and pumps these gears are indispensable.

The illustration shows a group of high ratio Wuest gears for 300 H. P. ball mills. The cast steel gears are made in ring form for mounting direct on the mills. The pinions are forged solid with their shafts and the shafts are coupled to the motors.

The smooth running qualities of Wuest gears have led to their adoption on steam and air driven hoists where high ratios of reduction are not needed.

We manufacture special fly wheel gears for large air compressors driven from high speed motors.

Full particulars for any kind of drive may be obtained by application to The Falk Company.



THE EVERHART BRASS WORKS

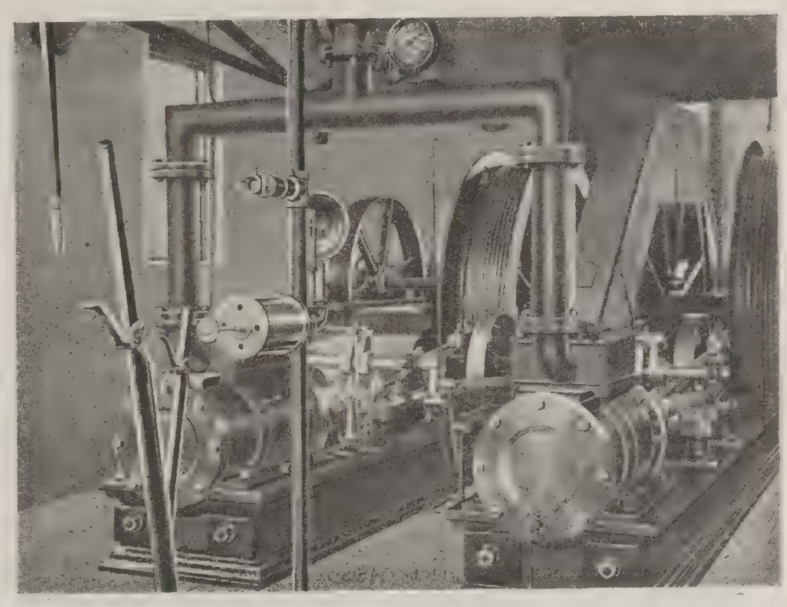
422-424 Penn Avenue, Scranton, Pa., U. S. A.

Products

Anemometers; Babbitt Metal; Castings, (Brass & Bronze); Gongs; Valves, (Globe, Angle and Check); Signaling Systems.

Pneumatic Signal Gong

The illustration herewith gives a clear idea of the Pneumatic Signal Gong Attachment for Speaking Tubes, and shows the outfit which is generally installed at each station or place at which signals are to be sent and received. The installation of the proper number of these attachments makes a complete hoisting and communicating system between shaft, engine house and tipple or other places as desired. The outfit as shown in the illustration herewith, consists of a heavy brass gong with stem and striker, brass air-chamber and an extra heavy brass speaking tube mouthpiece with whistle.



The air-chamber cylinder is fitted with a bronze plunger having a steel plunger rod, on the outer end of which is attached a bronze handle. The gong regularly furnished is eight inches in diameter, made of cast bell metal, and gives a loud, clear signal. The stem of the gong contains a striker which normally rests on a projection made by counterboring the stem.

Advantages

Misunderstanding of signals impossible.

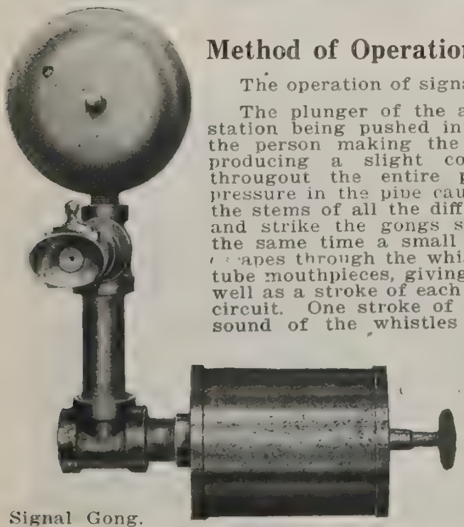
There is no possibility of either Engineer or Footman receiving different signals.

All signals are repeated **simultaneously** at all stations, clear and sharp, without the slightest echo.

There are no wires to break, to short-circuit or cross by falling material.

Maintenance cost, nothing.

Greater safety and efficiency.

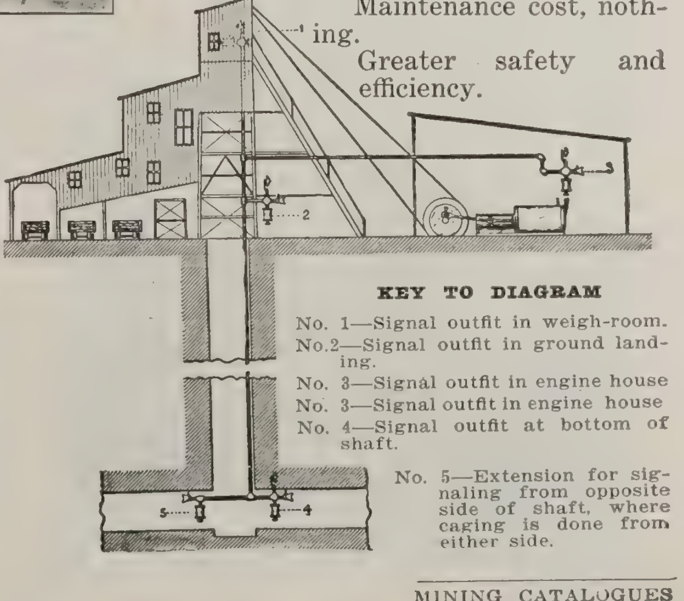


Signal Gong.

Method of Operation

The operation of signaling is as follows:

The plunger of the air-cylinder at any station being pushed into the cylinder by the person making the signal, results in producing a slight compression of air througout the entire pipe circuit. This pressure in the pipe causes the strikers in the stems of all the different gongs to rise and strike the gongs simultaneously. At the same time a small amount of the air escapes through the whistle at all speaking tube mouthpieces, giving whistle signals as well as a stroke of each gong on the signal circuit. One stroke of the gongs and one sound of the whistles is obtained every time any one of the different air-cylinder plungers is operated. Any number of gong and whistle signals can be made by pressing the air-cylinder plunger the desired number of times.



KEY TO DIAGRAM

No. 1—Signal outfit in weigh-room.
No.2—Signal outfit in ground landing.
No. 3—Signal outfit in engine house
No. 3—Signal outfit in engine house
No. 4—Signal outfit at bottom of shaft.
No. 5—Extension for signaling from opposite side of shaft, where caging is done from either side.

GENERAL ELECTRIC COMPANY

General Office:
Schenectady, N. Y.

The Guarantee of Excellence
on Goods Electrical

Sales Offices
In All Large Cities

Electrical Equipment for Mines---Hoists

G-E motor driven hoists have been installed in large numbers during the past year (1914-15). Many of these hoists were furnished on repeat orders from satisfied users.

APPROXIMATE LIST OF ELECTRIC COAL MINE HOIST INDUCTION MOTORS 250 H.P.

Name of Company and Location of Mines	Inclination to Horizontal	Maximum Depth in Feet	Hourly Tonnage (2000) Lb.	Material Per Trip in Lb.	Wt. of Skip or Cars and Cage	Rope Speed in Ft. Per Min.	Hoist Motor Rating in H.P.	Hoist Motor Speed in R.P.M.	Hoist Motor Voltage	Hoist Motor Frequency
Lehigh & Wilkesbarre Coal Co., Ashley, Pa.							250	450	440	60
Lehigh & Wilkesbarre Coal Co., Wilkesbarre, Pa.							250	450	440	60
Cerro de Pasco Mining Co., Peru, S. A.	90°	1000		7,000	7,500	800	250	450	2200	60
Consolidation Coal Co., Acosta, Pa.	90°	440		3,500	10,000	1225	250	450	2300	60
Davis Coal & Coke Co., Cumberland, Md.	2¾°-3½°	7000		52,500	27,000	750	270	600	550	60
Philadelphia & Reading Coal & Iron Co., Shamokin, Pa.	20°	500		23,700	10,800	600	275	450	2100	60
Pittsburgh Coal Co., Pittsbrugh, Pa. (3 equipments)	90°	220	480	8,000	12,000	800	300	300	2300	60
Pennsylvania Coal Co., Dunmore, Pa.	3½°-9°	2775	158	71,000	33,000	500	300	450	440	60
Pennsylvania Coal Co., Dunmore, Pa.	2½°-9°	3535	125	71,000	33,000	500	300	450	440	60
Pennsylvania Coal Co., Dunmore, Pa.	5°-11°	4930	112	71,000	33,000	500	300	450	440	60
Consolidated Indiana Coal Co., Melcher, Iowa	90°	215		4,000	8,700	1030	300	450	2200	60
Consolidation Coal Co., Jenner, Pa.							300	450	2200	60
Greensburg Coal & Coke Co., Greensburg, Pa.	90°	190	353	4,500	13,650	1140	300	450	2300	60
J. K. Dering Coal Co., Clinton, Ind.	90°	274	300	3,400	6,200	1370	300	514	2200	60
Central Coal Co., Kimberly, Ala.		575				800	300	600	220	60
Victor American Fuel Co., Trinidad, Colo.	Slope	2600		70,000	36,000	600	300	600	440	60
Victor American Fuel Co., Gallup, N. M.	Slope	3600		76,000	36,000	600	300	600	440	60
Lehigh Coal & Navigation Co., Lansford, Pa.	90°	1110	110	11,500	16,500	900	325	375	2200	25
Victor American Fuel Co., Hastings, Colo.	Slope	5000		70,000	36,000	600	375	600	440	60
Victor American Fuel Co., Gallup, N. M.	Slope	5000		70,000	36,000	600	375	600	440	60
Henderson Coal Co., Gwendolen, Pa.	90°	360		5,200	10,300	1740	400	514	440	60
Lackawana Coal & Coke Co., Wehrum, Pa.	90°	271	500	16,000	10,000	700	400	514	2200	60
New River Co., McDonald, W. Va.	90°	453	252	4,200	6,700	1680	400	600	2300	60
New River Co., McDonald, W. Va.	90°	467	216	3,600	6,000	2000	400	600	2300	60
New River Co., McDonald, W. Va.	90°	525	180	3,000	9,600	1780	400	600	2300	60
New River Co., McDonald, W. Va.	90°	422	198	3,300	6,600	1780	400	600	2300	60
Lehigh Coal & Navigation Co., Lansford, Pa.	73°	825	267	11,500	13,500	900	425	375	2200	25
New River Co., McDonald, W. Va.	90°	609		3,360	6,500	2070	450	600	2200	60
Vandalia Coal Co., West Terre Haute, Ind.	90°	280	540	6,000	7,000	1560	500	450	2200	60
Kemmerer Coal Co., Sublet, Wyo.	18°	4000	150	50,000	25,000	1200	500	450	2200	60
D., L. & W. Coal Co., Nanticoke, Pa.	4½°-30°	4000	200	40,000	15,000	1200	600	400	440	60
Victor American Fuel Co., Gallup, N. M.	Slope	6000		95,000	45,000	600	600 {300 300}	600	440	60
New River Co., McDonald, W. Va.	90°	695		3,360	6,500	2400	600	600	2200	60
Keystone Coal & Coke Co., Greensburg, Pa.	2½°-3½°	8750	300	240,000	100,000	1000	700	300	2200	60
Lehigh Coal & Navigation Co., Lansford, Pa.	90°	900	80	11,500	16,500		750	300	2200	25
D., L. & W. Coal Co., Hampton, Pa.	90°	550	1020	34,000	17,000	740	800	225	2200	60
Lehigh Coal & Navigation Co., Lansford, Pa.	90°	865		30,000	17,000	1100	1200	300	2200	25
Tennessee Coal Iron & Railway Co. Muscoda, Ala.	23½°	5280	100	26,880	13,440	2700	1800	360	2200	60

APPROXIMATE LIST OF ELECTRIC COAL MINE HOIST D-C. MOTORS 200 H.P.

Name of Company and Location of Mine	Inclination to Horizontal	Max. Depth in Feet	Hourly Tonnage (200) Lb.	Material Per Trip in Lb.	Wt. of Skip or Cars and Cage	Rope Speed in Feet	Hoist Motor Rating in H.P.	Hoist Motor Speed in R.P.M.	MOTOR-GENERATOR SET				
									Motor			Generator Flywheel	
									Voltage	Rating in H.P.	In Volt-R.P.M.	In Voltage	Weight in Lb.
Colorado Fuel & Iron Co., Denver, Colo.	90°						250	90	440	125	900	260	6500
Cambria Coal Co., Royalton, Ill.	90°	280		7,000	10,000	910	250	600	2200	200	900	250	6000
Silver King Coalition Mines, Park City, Utah	90°	1100	437	6,000	3,300	1630	300	65	2200	240 kv-a.	720	600	Syn. motor
Osage Coal Mining Co., McAlester, Okla.	60°	720	250	8,350	5,500	1140	350 {175 175}	350					
N. River & Pocahontas Consol. Coal Co., Herberton, W. Va.	90°	420	225	3,000	8,000	2200 max.	380	88	2200	850 kv-a.	720	275	Syn. motor
Middle Pork Mining Co., Benton, Ill.	90°	650		8,000	11,000		1150	100	2200	600	720	450	25,000
Christopher Coal Co., Christopher, Ill.	90°	687	643	9,000	11,000	2400	1150	109	2300	650	600/510	550	22,600
Peabody Coal Co., Nokomis, Ill.	90°	687	874	16,000	19,000	1950 max.	1300	57	2300	950	514/435	550	33,000
Consolidation Coal Co., Fairmont, W. Va.	90°	559	585	6,500	14,800		1400	90	2200	600	720	550	29,000
Consolidation Coal Co., Fairmont, W. Va.	90°	529		6,500	14,800		1400	90	2200	600	720	550	29,000

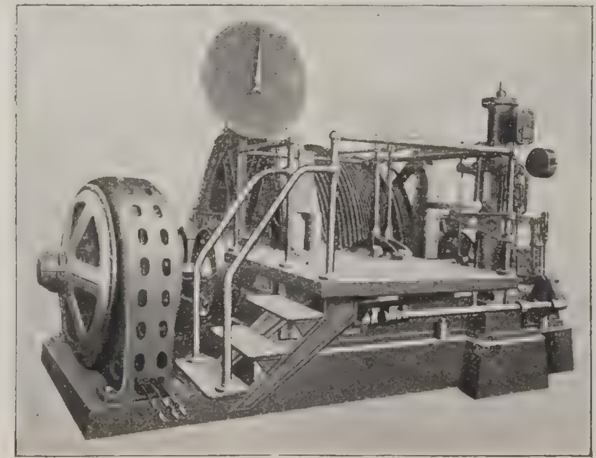
Mine hoists driven by G-E motors are operated at low costs because, first, boilers are eliminated, saving cost of their attendance; second, vibration on rope is decreased—increasing its life and that of the head gear, etc., finally because no power is used during idle moments though ample power is always available when needed.

In 1912 South African engineers selected G-E equipment for the largest hoist in the world. This 4000 h. p. hoist has carried momentary loads of 11,000 h. p. on test.

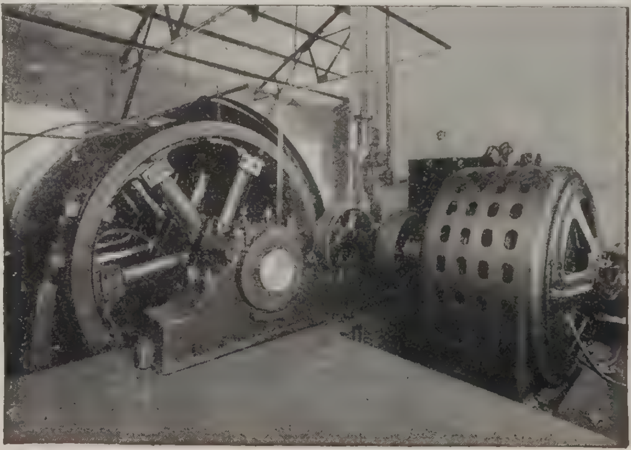
The Tennessee Coal & Iron Company ordered the motor and control equipment for the largest 1800 h. p.—alternating current hoist in the world from the General Electric Company.

Scores of smaller hoists are driven by G-E equipment and in common with the large ones have practically no repair bills after years of service.

A large Pennsylvania Coal Company have a 750 h. p. electric hoist, operated by G-E equipment at Lansford, Pa., which they state when working up to capacity, has an electric power bill less than the boiler labor required with steam hoists.



Mine Hoist Driven by G-E Motor, Pittsburgh Coal Company.



750 H. P. Hoist, No. 5 Shaft, Lehigh Coal & Navigation Co.

WESTINGHOUSE ELECTRIC & M'F'G CO.

EAST PITTSBURGH, PA.

SALES OFFICES

Atlanta, Ga.
Baltimore, Md.
Birmingham, Ala.
Bluefield, W. Va
Boston, Mass.
Buffalo, N. Y.
Butte, Mont.
Charleston, W. Va.
Charlotte, N. C.
Chicago, Ill.
Cincinnati, Ohio.
Cleveland, Ohio.
Columbus, Ohio.
Dallas, Tex.
Dayton, Ohio.
Denver, Colo.
Detroit, Mich.
*El Paso, Tex.
*Houston, Tex.
Indianapolis, Ind.
Joplin, Mo.
Kansas City, Mo.
Louisville, Ky.
Los Angeles, Cal.
Memphis, Tenn.
Milwaukee, Wis.
Minneapolis, Minn.
New Orleans, La.
New York, N. Y.
Omaha, Neb.
Philadelphia, Pa.
Pittsburgh, Pa.
Portland, Ore.
Rochester, N. Y.
St. Louis, Mo.
Salt Lake City, Utah.
San Francisco, Cal.
Seattle, Wash.
Syracuse, N. Y.
Toledo, Ohio.
Washington, D. C.

*W. E. & M. Co., of Texas.

Westinghouse Induction Motors for Hoisting and Similar Service

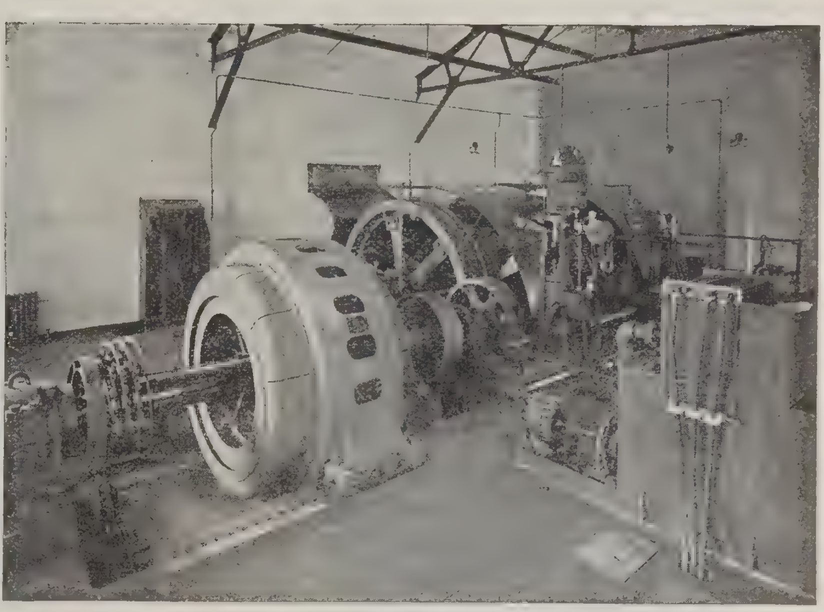
Products

Electrical Equipments for all mining apparatus.

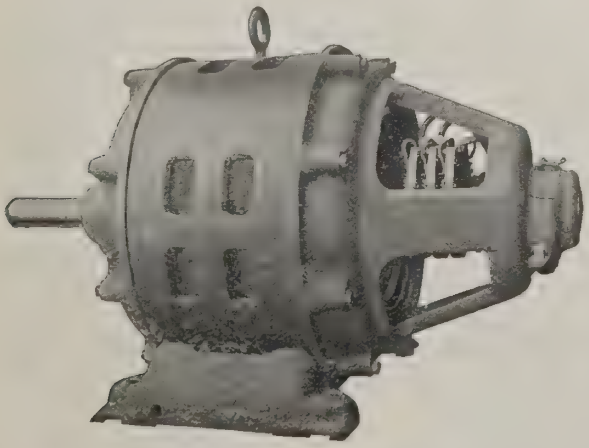
Type CI With Wound Secondaries

These motors have strong starting torque for starting heavy loads, especially in reversing service. The rotors are small in diameter, permitting ready braing and quick reversal.

In general the mechanical construction is similar to our squirrel cage induction motors type CS, except for the rotor winding, embodying the latest methods of construction, such as pressed or rolled steel instead of cast iron, etc. Form wound coils are used throughout, making possible quick repairs in case of accident. The bearings are very liberal and the air gap is large, giving unusually long life.



200 H. P. Type C. I. Motor, Showing Massive Frame Construction.



75 H. P. Type C. I. Motor, Showing Rolled Steel Frame Construction.

These motors are built for 60 cycle circuits, two or three phase, 220 and 440 volts, and 3 phase 550 volts. Motors for 2200 volts 3 phase can be supplied in most sizes.

RATINGS

H. P.	APPROXIMATE FULL LOAD SPEEDS.			
75	900	720	600	
100		720	600	
150		720	600	
200			600	514
250			600	514
300			600	514

ESTABLISHED 1900.

ROYER AND ZWEIBEL

WILKES-BARRE, PA.

Manufacturers of the

ROYBEL

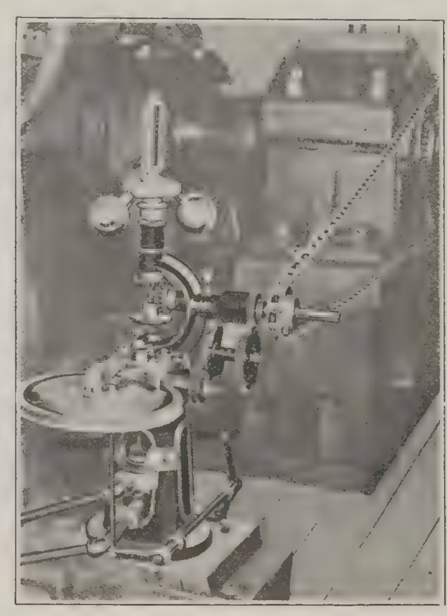
Emergency Governor for Steam or Electric Hoists

Products

Roybel Emergency Governors for Steam or Electric Hoists;Steam Brakes, and Fan or Cage Rest Indicators. Ask us about them.

The Roybel Emergency Governor

The insurance policy that does not reimburse for sustained losses by over winding, but pays in advance by preventing loss of life, destruction of property and delays in operation from this cause. Let us prove this.

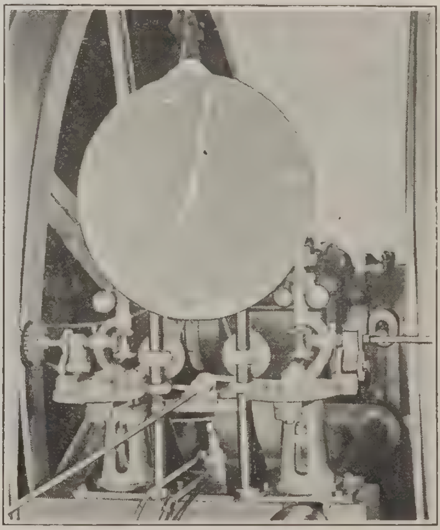


Single or Tight Drum Governor.

In calling attention to the ROYBEL Emergency Governor for preventing the overwinding of hoisting machinery, especially in mine cages, we wish to say that we could print many pages explaining the merits of our governor, produce testimonials from users as to its efficiency, call attention to the many thousand times the cage ascends and descends the shaft in a given time, cite cases of great loss of life and property on account of a moment of forgetfulness on the part of the engineer—produce statistics to show that from an insurance standpoint you can not afford to be without it, all of which no doubt would make interesting reading matter for advertising purposes, but fully realizing that under the efficient and up-to-date present day mine management the necessity for a governor of this kind is well known, we solicit an opportunity to prove that our governor governs in emergency.

Just A Word As To How Our Governor Governs

It is regulated so that the hoist can not exceed a certain speed during a complete trip, the operator must reduce the speed when approaching the landing within determined safe limits, failure to reverse on completion of a trip the hoist is brought to rest, and is automatically arranged so that when hoisting passengers the cage can not pass the ground level.



Double or Clutch Drum Governor
With Dial.

The DIAL on the double or clutch drum governor tells the exact position of each cage in the shaft, the pointers stop at the one mark regardless of which level is being served.

If you want the best, specify the ROYBEL when ordering a new hoist.

Some of the users of the ROYBEL

- L. V. Coal Co.
- Maryd Coal Co.
- Payne Coal Co.
- Meadow Lands Coal Co.
- D. L. & W. Coal Co.
- D. & H. Coal Co.
- Temple Coal Co.
- W-B Anthracite Co.

THE OSBORN MACHINE CO.

DU BOIS, PENNA.

Manufacturers of

Automatic Engine Controlled Safety Gate

Products

- Steel Stacks.
- Boiler Repairs.
- Plate and Sheet Metal Work.
- Structural Steel Work.
- Fire Escapes.
- Oxy-Acetylene Welding—Field or Shop.
- Machine Work.
- Cylinder Reboring—Field or Shop.
- Mine Shaft Safety Gate.
- Iron and Brass Castings.
- Mine and Mill Supplies.

Engineering Staff at Your Service.

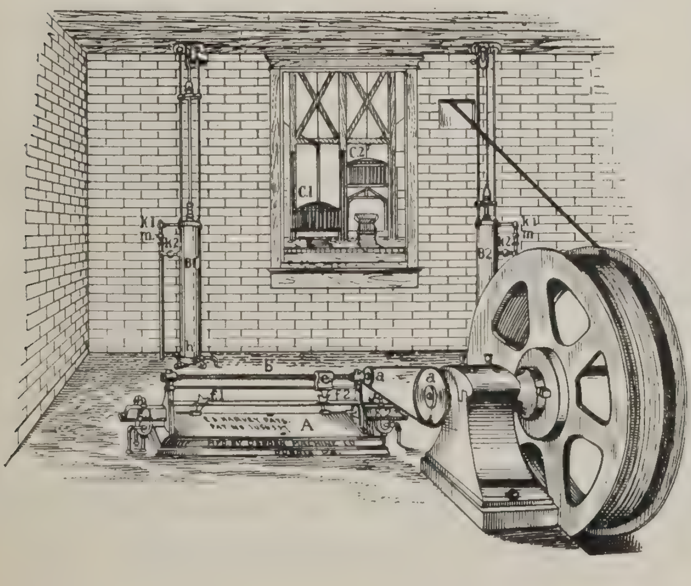
Prompt and Careful Attention to Orders and Inquiries.

Let us quote you.

The Harvey Automatic Gate
is intended for the protection of shaft landings, to preclude the possibility of anyone falling down the shaft when the cage is not at the landing, and is so designed as to open automatically as the cage stops there, and close again as it leaves.

The apparatus consists essentially of a control mechanism A, air cylinders with pistons, B-1 and B-2, and gates with connecting ropes, C-1 and C-2.

Control mechanism A is driven by sprockets and chain (a) from the winding engine shaft, which operates feed screw b. Screw b carries a traveling nut e, which acts on the levers f-l or f-2 and controls valves in cylinders g-1 or g-2, admitting air to upper side of piston in cylinders B-1 or B-2, and thus raising the gates. A cushion spring h, in bottom of cylinders B-1 or B-2, brings the piston and gates to rest without any jar. When traveling nut e has passed over lever f-1 or f-2, valves g-1 or g-2 open to atmosphere and cylinders B-1 or B-2 exhaust. Gates C-1 or C-2 fall by reason of their own weight, and assisted by the compression of spring h, in cylinders B-1 and B-2, which starts the piston.



By the arrangement of two pipe openings and two check valves k-1 or k-2, in the upper part of cylinders B-1 or B-2, the air in that length of cylinders is trapped by the piston on its upward stroke and acts as a cushion, bringing the piston, and consequently the gate, to rest quietly.

A ⅜ stranded steel rope running over suitable sheaves connects the piston to the gate.

The stop cock m is to regulate the air pressure necessary to operate the gate.

The apparatus works equally well with steam or air pressure.

All mechanism is in the engine room, so there is no trouble due to frost.

The control mechanism is so constructed that the levers f-1 and f-2 can be timed and adjusted correctly at the installation.

Control apparatus A occupies a space of about 4′ 0″ x 15″. Cylinders B are 5″ I. D. and 7″ 0″ long.

The gates are made of 1x4″ pine lumber, have an arched top, and are re-inforced with iron bars. The guides are 2″ pipe, with suitable castings on gates. One end is so arranged that by taking out one bolt the gate can be swung open, to facilitate handling long material such as rails.

If desired the gate can be equipped with an automatic catch to engage with the guides and prevent gate from falling on anyone passing beneath, should the rope break while the gate is up.

By looking at the piston rod the engineer can tell at any time if the gate is working properly; when the rod is up the gate is closed, and vice versa.

References

We have installed a great number of these gates and all are giving general satisfaction. They are endorsed by the leading operators, state mining departments and various inspectors.

Write for list of installations.

THERMOID RUBBER COMPANY

Factories and Main Offices
Trenton, New Jersey, U- S. A.

BRANCHES

Chicago, Ill.
Philadelphia, Pa.
Indianapolis, Ind.
Coventry, England

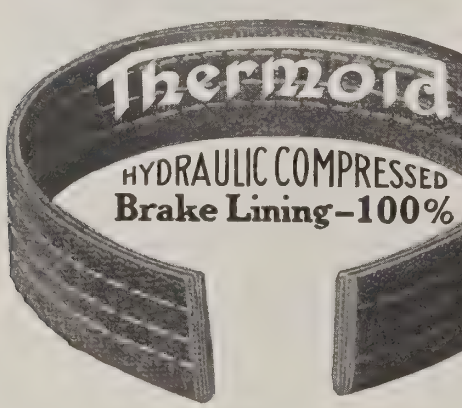
San Francisco, Cal.
Boston, Mass.
New York, N. Y.
Berlin, Germany

Pittsburgh, Pa.
St. Louis, Mo.
Detroit, Mich.
Paris, France

Moulded in Any Shape or Furnished in Rolls of any Width or Thickness.

For Cranes, Hoists, Steam Shovels, Dredges, Tractors, Clutches, Mining Equipment, Industrial Machinery, etc.

As a chain is only as strong as its weakest link, so also is a brake or clutch only as efficient as the material composing its gripping or braking surface. The function or purpose of all brakes is fundamentally the same. Stationary bands, shoes, blocks, etc., come into contact with some revolving part of the mechanism, and the friction or gripping of the brake retards the motion. Brakes or clutches are but other names for safety. Their efficiency, at any cost, must never be jeopardized. Wood, leather, metal, fiber-board, canvas belting, etc., for this purpose are rapidly becoming obsolete.



Not Affected by Heat, Oil or Gasoline.

Ten years of practical tests on every known class of machinery using brake lining has proven that Thermoid Hydraulic Compressed Brake Lining is the most efficient and outwears any brake lining, foreign or domestic, or any other brake material.

It is constructed of pure Canadian asbestos, interwoven and reinforced with brass wire and impregnated with a compound which adds great strength, durability and gripping power, and which makes the lining impervious to oil, water, gasoline, grease or dirt, and any heat to which it will ever be subjected in service. It is cured under 2,000 pounds pressure and extra high heat, and will not swell, burn out or dry out and get brittle. The hydraulic compression causes it to retain its full gripping or braking power, and it is not to be compared with a stringy, loosely-woven lining which has the friction or gripping qualities only on the surface.

Thermoid Hydraulic Compressed Brake Lining is flexible and conforms readily to the shape, and is easily fitted to brake band or drum, presenting a smooth, uniform wearing surface.

Asbestos Brake Blocks.

Thermoid Asbestos Brake Blocks are made any shape from special moulds and will accurately fit any style of machine. Composed of Canadian fibre asbestos, interwoven with brass wire impregnated with heat-proof friction compound, compressed and cured under 2,000 pounds hydraulic pressure, giving the same advantages enjoyed by our Hydraulic Compressed Brake Lining, such as being heat proof and not affected by oil, water, gasoline, dirt, etc. Will outlast many sets of ordinary blocks or bands of any other material. Made in any width, thickness, design or shape.

Unreliable brake lining is a deadly peril—Safety First.

GUARANTEE—Thermoid Brake Lining will make good or we will.

Inquiries solicited. Samples on request.

We want one good salesman, specializing on the mining trade, in each mining territory.

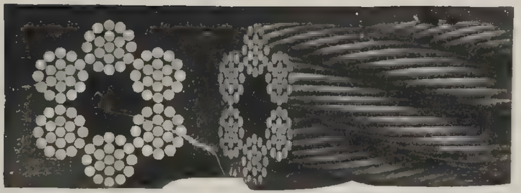
AMERICAN STEEL & WIRE CO.

Sales Offices:

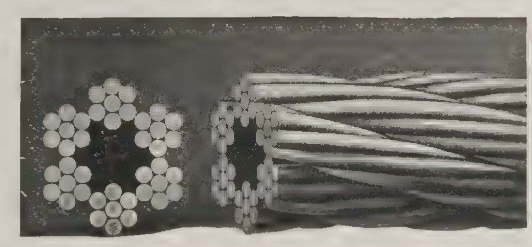
CHICAGO......208 So. La Salle Street
NEW YORK......30 Church Street
WORCESTER......94 Grove Street
BOSTON......120 Franklin Street
PHILADELPHIA......Widener Building
PITTSBURGH......Frick Building
BUFFALO......337 Washington Street
DETROIT......Foot of First Street
CINCINNATI......Union Trust Building
CLEVELAND......Western Reserve Building
BALTIMORE......32 So. Charles Street
WILKESBARRE, PA......Miners Bank Building
ST. LOUIS......3d National Bank Building
ST. PAUL-MINNEAPOLIS..Pioneer Bldg., St. Paul
OKLAHOMA CITY....State National Bank Building
BIRMINGHAM, ALA......Brown-Marx Building
DENVER......1st National Bank Building
SALT LAKE CITY......Walker Bank Building

Export Representative: U. S. Steel Products Co., New York
Pacific Coast Representative: U S. Steel Products Company
San Francisco Los Angeles Portland Seattle

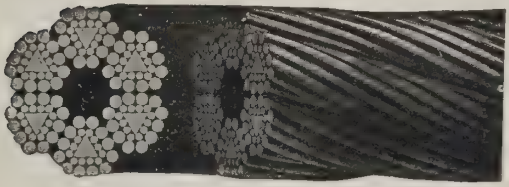
AMERICAN WIRE ROPE



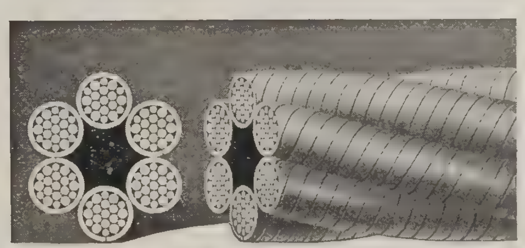
STANDARD HOISTING ROPE.
6 Strands, 19 Wires, 1 Hemp Core.



HAULAGE ROPE.
6 Strands, 7 Wires, 1 Hemp Core.



FLATTENED STRAND ROPE.
6 Strands, 25 Wires, 1 Hemp Core.



STEEL CLAD ROPE.
Note Exterior Serving of Flat Steel.

For Mine Hoists

In mine shaft the Standard Hoisting Rope shown above is almost universally used. Crucible and Extra Strong Crucible grades are most popular, but Plow Steel is sometimes employed, especially where the load is heavy. Standard Hoisting Rope in high strength Monitor grades are used (in ½ and ⅝ inches in diameter) in connection with coal cutting machines, also as main hoisting rope on steam shovels where the stripping process of mining is employed.

For Haulage and Tail End Purposes

The Haulage Rope is best suited. We make these ropes in many different constructions and of several grades of wire depending upon conditions at the mine.

For Steam Shovels

The Flattened Strand and Steel Clad Ropes are generally being particularly well adapted to the heavy strains and abrasion encountered in this class of work.

Stocks

Carried with jobbers and dealers in all mining communities also in our own warehouses at Chicago, New York, Pittsburgh, Buffalo, Cleveland and St. Louis.

BRODERICK & BASCOM ROPE CO.

New York ST. LOUIS Seattle

FACTORIES, ST. LOUIS AND SEATTLE. AGENTS IN ALL LOCALITIES.

From the early days when wire rope was made by hand, to the present when wonderful machines do the work better and quicker, Broderick & Bascom Wire Ropes have always been known as "quality" ropes. The standard set for each particular grade has never been lowered to meet price competition. And these standards are maintained by rigid tests both of the raw material and the finished rope.

Yellow Strand "Powersteel" Wire Rope manufactured by this company is undoubtedly the strongest steel rope of equal flexibility and elasticity ever made. Yellow Strand "Powersteel" of special construction was put to the most severe tests when employed in unloading spoil train at Panama. Government records show that it unloaded **three times** as many trains before breaking as had ever been unloaded before by any other rope. Yellow Strand hoisting ropes are used in every coal field with wonderful success.

Following are the brands of Broderick & Bascom wire ropes and descriptions, with list prices of the sizes most used in coal production:

"YELLOWSTRAND"
POWERSTEEL WIRE ROPE

(Registered Trade Mark)

Hoisting Rope

The most powerful wire rope made. 6 strands, 19 wires per strand, around a hemp center.

Diameter in inches	List price per foot	Circumfer. in inches	Approx. weight per foot	Approx. streng. tons 2000 lbs.	Prop. work load tons 2000 lbs.	Diam. drum or sheave feet advised
¼	$ .13	¾	.10	3.15	.63	1
5/16	.13½	1	.15	4.50	.9	1¼
⅜	.14½	1⅛	.22	6.75	1.35	1½
7/16	.15½	1¼	.30	9.4	1.9	1¾
½	.17	1½	.39	12.1	2.4	2
9/16	.19	1¾	.50	14.5	2.9	2¼
⅝	.22½	2	.62	19	3.8	2½
¾	.31	2¼	.89	26.3	5.3	3
⅞	.39	2¾	1.20	35	7	3½
1	.50	3	1.58	45	9	4
1⅛	.62	3½	2	56	11	4½
1¼	.75	4	2.45	69	14	5
1⅜	.90	4¼	3	84	17	5½
1½	1.10	4¾	3.55	98	20	6

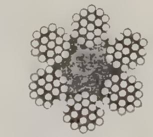
Patentsteel Wire Rope

(Registered Trade Mark)

"Patentsteel" is the result of twenty-five years of experimenting with high grade steel wire.

Its strength is between that of ordinary Crucible Cast Steel and Plow Steel. While not so strong as either Plow Steel or Yellow Strand, it has the advantage of extreme pliability, which must be sacrificed to some extent in making wire rope for extra heavy work.

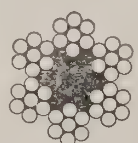
"Patentsteel" is made from a very fine grade of mild Plow Steel wire, and combines the greatest degree of toughness, ductility and elasticity, together with a very high degree of tensile strength. It is especially recommended for Haulage Ropes.



Patentsteel Hoisting Rope

6 strands, 19 wires per strand, around a hemp center.

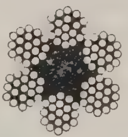
Diameter in inches.	List price per foot.	Circumfer. in inches.	Approx. weight per foot.	Approx. streng. tons 2000 lbs.	Prop. Work. load tons 2000 lbs.	Diam. drum or sheave in ft. advised.
¼	$ .10½	¾	.10	2.43	.49	1
5/16	.10¾	1	.15	3.50	.70	1.25
⅜	.11	1⅛	.22	5.30	1.06	1.50
7/16	.11½	1¼	.30	7.25	1.45	1.75
½	.12½	1½	.39	9.2	1.84	2
9/16	.14	1¾	.50	11.2	2.24	2.25
⅝	.16½	2	.62	14	2.80	2.5
¾	.22	2¼	.89	20.2	4.04	3
⅞	.29	2¾	1.20	26	5.20	3.5
1	.37	3	1 58	34	6.80	4
1⅛	.46	3½	2	43	8.06	4.5
1¼	.56	4	2.45	53	10.6	5
1⅜	.68	4¼	3	64	12.8	5.5
1½	.80	4¾	3.55	73	14.6	6



Patentsteel Haulage Rope

6 strands, 7 wires per strand, around a hemp center.

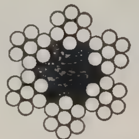
½	.09½	1½	.39	8.85	1.8	3½
9/16	.12	1¾	.50	11	2.2	4
⅝	.14¼	2	.62	14.5	2.9	4½
11/16	.17	2⅛	.75	16.7	3.3	4¾
¾	.20	2¼	.89	21	4.2	5
⅞	.27	2¾	1.20	28	5.6	6
1	.35	3	1.58	35	7	7



Plow Steel Hoisting Rope

6 strands, 19 wires per strand, around a hemp center.

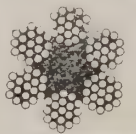
Diameter in inches.	List price per foot.	Circumference in inches.	Approximate weight per foot.	Approximate strength tons of 2000 lbs.	Proper work'g load in tons 2000 lbs.	Diam. of drum or sheave in feet advised.
¼	$ .12	¾	.10	2.65	.53	1
5/16	.12¼	1	.15	3.8	.76	1.25
⅜	.12½	1⅛	.22	5.75	1.15	1.50
7/16	.13	1¼	.30	8	1.6	1.75
½	.14	1½	.39	10	2	2
9/16	.16	1¾	.50	12.3	2.4	2.25
⅝	.19	2	.62	15.5	3.1	2.5
¾	.26	2¼	.89	23	4.6	3
⅞	.34	2¾	1.20	29	5.8	3.5
1	.43	3	1.58	38	7.6	4
1⅛	.54	3½	2	47	9.54	4.5
1¼	.65	4	2.45	58	12	5
1⅜	.79	4¼	3	72	14	5.5
1½	.93	4¾	3.55	82	16	6
1⅝	1.08	5	4.15	94	19	6.5
1¾	1.30	5½	4.85	112	22	7



Plow Steel Haulage Rope

6 strands, 7 wires per strand, around a hemp center.

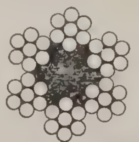
9/32	$ .05½	⅞	.12½	3.4	.68	1¾
5/16	.06	1	.15	4.4	.88	2¼
⅜	.06¾	1⅛	.22	5.9	1.2	2¾
7/16	.09	1¼	.30	7	1.4	3
½	.11½	1½	.39	10	2	3½
9/16	.14½	1¾	.50	12	2.4	4
⅝	.17½	2	.62	16	3.2	4½
11/16	.21	2⅛	.75	18	3.6	4¾
¾	.24½	2¼	.89	23	4.6	5
⅞	.32	2¾	1.20	31	6.2	6
1	.41	3	1.58	38	7.8	7
1⅛	.51	3½	2	47	9.8	8
1¼	.62	4	2.45	60	12.4	9
1⅜	.76	4¼	3	72	14.6	10
1½	.90	4¾	3.55	82	16.8	11



Crucible Cast Steel Pliable Hoisting Rope

6 strands, 19 wires per strand, around a hemp center.

Diameter in inches.	List price per foot.	Circumfer. in inches.	Approx. weight per foot.	Approx. streng. tons 2000 lbs.	Prop. work load tons 2000 lbs.	Diam. drum or sheave in feet advised.
¼	$ .09	¾	.10	2.2	.44	1
5/16	.09¼	1	.15	3.1	.62	1.25
⅜	.09½	1⅛	.22	4.8	.96	1.50
7/16	.10	1¼	.30	6.5	1.30	1.75
½	.11	1½	.39	8.4	1.68	2
9/16	.12	1¾	.50	10	2	2.25
⅝	.14	2	.62	12.5	2.5	2.5
¾	.19	2¼	.89	17.5	3.5	3
⅞	.24	2¾	1.20	23	4.6	3.5
1	.31	3	1.58	30	6	4
1⅛	.38	3½	2	38	7.6	4.5
1¼	.46	4	2.45	47	9.4	5
1⅜	.56	4¼	3	56	11.2	5.5



Crucible Cast Steel Haulage Rope

6 strands, 7 wires per strand, around a hemp center.

7/16	.06½	1¼	.30	5.5	1.1	3
½	.08	1½	.39	7.7	1.5	3½
9/16	.10	1¾	.50	10	2	4
⅝	.12	2	.62	13	2.6	4⅓
11/16	.14½	2⅛	.75	15.4	3.1	4¾
¾	.17	2¼	.89	18.6	3.7	5
⅞	.22½	2¾	1.20	24	4.8	6
1	.29	3	1.58	31	6.2	7

HAZARD MANUFACTURING CO.

WILKES BARRE PA

NEW YORK
533 Canal Street

PITTSBURGH
1st Nat'l Bank Building

CHICAGO
552 W. Adams Street

**HOISTING
AND
HAULAGE
ROPES**

HAZARD WIRE ROPE

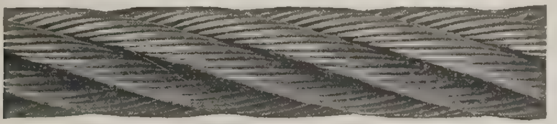
**GALVANIZED
STRAND
HAND FORGED
FITTINGS**

MADE FOR USERS WHO WANT THE BEST

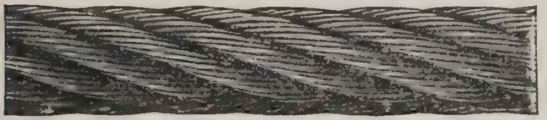
Products

Wire Rope, Galvanized Strand and Fittings.

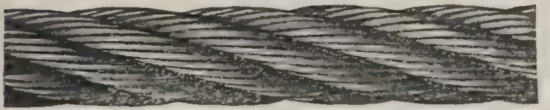
The following sections show the various ropes applicable to mine use.



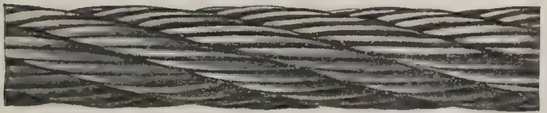
HAZARD Standard Hoisting Rope.



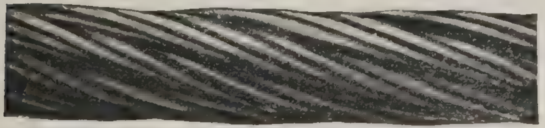
HAZARD Flexible Hoisting Rope.



HAZARD Cable Construction Rope.
(Seal Patent)



HAZARD Haulage Rope, Regular Lay.



HAZARD Haulage Rope, Lang Lay.

HAZARD Swedes Iron Wire Rope

Is made from the Best Swedish Iron, imported by us in the form of rods, drawn and finished into Wire in our own Wire Mill. It is made according to standards of material and construction that are uncheapened under competition, and gives the best value, because the best is the cheapest.

HAZARD Cast Steel Wire Rope

Is made from the best steel obtainable in the markets of the world for Wire Rope use. It is unexcelled because it contains the best material and is constructed by methods embodying the best skill and workmanship which have been developed in this country. The HAZARD MANUFACTURING COMPANY has never cheapened or lowered its standards of material or construction.

HAZARD Plough Steel Wire Rope

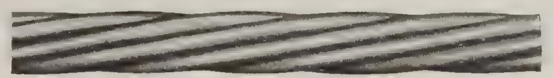
Is made from the best Plough Steel that is to be obtained in the markets of the world. It stands for absolute fidelity to the best standards of construction and material. It gives the best results under listed conditions of load, diameter of drums and sheaves that can be secured at the price charged.

HAZARD "Olympic Brand" Wire Rope

Represents the latest and best development in the adaptation of steel to Wire Rope use. It is made with breaking strains 15 to 20 per cent above the strains given in our regular Plough Steel Wire Rope lists. The Wire is specially treated in our Tempering Mill and Wire Mill for the greatest obtainable strength.

HAZARD Extra Galvanized Special Strength Strand

Is made in three grades of strength and quality; **Siemens-Martin Steel, High Strength** and **Extra High Strength.** It is the best Galvanized Strand that can be made in the three grades of strength. It is sold by special list with **guaranteed weights and strains,** subject also to the A. T. & T. Co., Western Union and Postal Telegraph Companies' specifications for galvanizing.



HAZARD Extra Galvanized Special Strength Strand.

HAZARD Hand Forged Wire Rope Fittings

Are made to meet the demand for Fittings which are absolutely reliable, to be used on Wire Ropes.

These Fittings are made of the finest quality of Imported Triple Refined Iron, in our own blacksmith shop. They are made extra heavy and of proper dimensions to develop the maximum breaking efficiency of the Wire Rope with which they are designed to be used.

A. LESCHEN & SONS ROPE CO.

ST. LOUIS, U. S. A.

Branch Stores:
NEW YORK CHICAGO DENVER SALT LAKE CITY SAN FRANCISCO

MANUFACTURERS OF

High Grade Wire Rope for All Purposes---Aerial Wire Rope Tramways

Products

Wire Rope for all purposes, of both special and stadard grades and constructions, including the famous HERCULES (Red Strand) Wire Rope, Wire Ropes of Patent Flattened Strand construction, Locked Coil Wire Ropes and Locked Coil Cables; Wire Rope Blocks, Clips, Thimbles, Sockets and Hooks; Wire Rope Lubricants; Aerial Wire Rope Tramways.

RED HERCULES STRAND WIRE ROPE
The Original Colored Strand Wire Rope

Design and Workmanship

Every process in the manufacture of Leschen Wire Rope is according to our own exclusive methods, and is accompanied by exacting tests and rigid inspections. Each rope is made to conform to the design that we have found from experience to be best for the particular work the rope is to perform, and the remarkable success of Leschen wire rope is in no small measure due to its special method and manner of construction.

Quality of Material

Leschen Wire Ropes for mining are furnished in the following grades: HERCULES (Red Strand) Wire Rope, Special Steel, Plough Steel and Cast Steel.

Hercules Wire Rope

This is a rope of the very highest quality. It represents the correct combination of strength, elasticity, toughness and flexibility for maximum service. It is the best that can be bought at any price, and because of its durability it is the most economical rope for heavy work, that can be obtained. It is recommended for mine hoisting and hauling, steam shovels, mining machines, etc. HERCULES Wire Rope always has one **red** strand for identification purposes. It is made in Round and Patent Flattened Strand constructions.

Special Steel

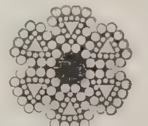
A grade of rope of but moderate cost, but possessing high efficiency in a wide variety of operating conditions. Its flexibility is equal to lower strength ropes (an uncommon property), consequently it is well suited for work over small drums and sheaves. Its advantages in point of strength, toughness, durability, and general trustworthiness, are exceptional.

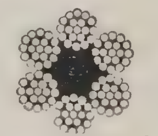
Plough Steel

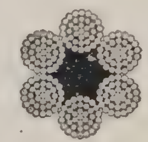
The tensile strength developed in Plough Steel Wire Rope is high, and this rope is successfully used where heavy work is performed under conditions where sufficiently large drums and sheaves are practicable.

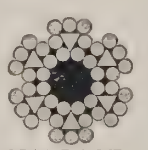
Cast Steel

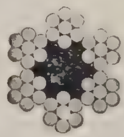
Cast Steel Wire Rope is standard for ordinary work, being of moderately high tensile strength and quite flexible. It works to good advantage over small sheaves and drums. Its use is general where there are no excessive stresses or unusual conditions encountered.


HOISTING
Patent
Flattened
Strand
(6 x 25)


HOISTING
AND
MINING
MACHINES
Round Strand
(6 x 19)


HOISTING
AND
MINING
MACHINES
Round Strand
(6 x 37)


HAULAGE
Patent
Flattened
Strand
(6 x 8)


HAULAGE
Round Strand
(6 x 7)

Wire Rope Construction

The numerous wire rope uses, each having its peculiar working conditions, require the manufacture of wire rope in a number of constructions.

Patent Flattened Strand

The greatest advantages afforded by the Patent Flattened Strand construction are: additional wearing surface, greater strength and flexibility, and resistance to crushing. For reasons simple and practicable it operates with economy under conditions where no other constructions of wire rope can work successfully. Especially recommended for mine hoisting and hauling, and for steam shovels.

Round Strand

Round Strand Wire Rope is composed of a number of wires twisted into a round strand, which are then laid around a hemp center. A rope is usually composed of six or eight strands, which are in turn made of seven, nineteen or thirty-seven wires each.

Dragon Brand Wire Rope

Dragon Brand Wire Rope is especially recommended for conveying machinery. It is a Patent Flattened Strand construction having the wires in every other strand laid in different directions, which eliminates twisting and rotating. The keystone shape of the strands prevents them from straightening out, thereby making it nonstretching.

Lay of Wire Rope

We can furnish wire rope in right lay, left lay, regular lay or Lang's lay. Tell us how your rope is to work and we will recommend the best lay to be used.

Aerial Wire Rope Tramways

Leschen Aerial Tramways provide efficient and economical means of transporting material of every description. Special system for disposing of waste materials. Full information upon request.

Wire Rope Lubricant

If best results are to be obtained from wire rope, its proper lubrication is essential. We furnish correct lubricant for every class of wire rope service. Write for catalog.

Engineering Department

An important factor in wire rope economy is the correct selection of rope construction. We have a large Engineering Department which has made careful study of mining conditions, and we shall gladly help you solve your wire rope problems.

MACOMBER & WHYTE ROPE CO.

MONARCH WIRE-ROPE
"ALWAYS ONE WHYTE STRAND."
TRADE MARK REGISTERED.

Main Office and Works:
KENOSHA, WIS.
BRANCH OFFICES
Chicago, Portland, Pittsburgh,
Manufacturers of
Wire Rope of Every Description
Sole Makers
PATENT "KILINDO" NON-ROTATING WIRE ROPE
"MACWHYTE" WIRE ROPE
MONARCH WHYTE STRAND WIRE ROPE

KILINDO WIRE-ROPE
"ROPE THAT'S RIGHT"
MACOMBER & WHYTE.
POSITIVELY NON-ROTATING
TRADE MARK REGISTERED.

Products

Wire Rope, Sockets, Hooks, Thimbles, Wire Rope Clips, Turnbuckles, Sheaves, Blocks, "Monarch" Mine Car Hitchings, Manila Rope, Tramways.

Monarch "Whyte" Strand Wire Rope.

This is the highest grade rope manufactured. It is made from wire having a tensile strength of 125 tons to the square inch. It is uniform and dependable. The wire before entering the rope is subjected to stringent tests and unless our high standards have been complied with, the wire is rejected. In the manufacture of this rope great care is exercised. The lay of the wires in the strands as well as the strands themselves are perfectly proportioned so as to give each wire an equal portion of the working load. The core is number one hard laid Manila rope, which prevents the rope from pulling in and distorting its lays when subjected to severe strains. This rope is made in various constructions to suit working conditions. It is an absolutely safe rope, incomparable in wearing quality to any other cable on the market and is strong, durable and tough.

Patent Kilindo Non-Rotating Wire Rope

This rope is manufactured by us under a patent issued to George S. Whyte. It is being imitated by several concerns who will probably be lead to see the error of their ways before very long. Kilindo Non-Rotating Rope is exactly what its name implies. It does not rotate or spin when hoisting a loose load. It is, therfore, especially adapted for shaft sinking purposes, and it is also especially desirable to use this rope wherever a non-spinning rope is needed.

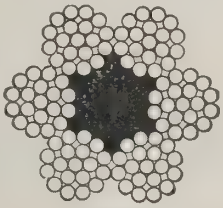
The word "Kilindo" is a combination of Greek words meaning "almost round." This brand of rope has a much larger wearing surface than the ordinary six strand rope.—About 200%.

We manufacture Kilindo in all grades such as "Monarch" steel, Plough steel, "MacWhyte" steel, Mild Plough steel, Crucible steel and Swedes iron.

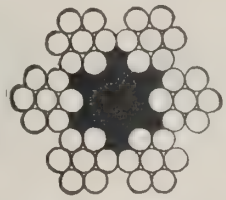
"Macwhyte" Wire Rope

A rope of superior merit, built for mining service where conditions are difficult. Made in various constructions to suit conditions.

This illustration shows our Standard Hoisting Wire Rope, which is composed of six strands of nineteen wires each, laid around a hemp center, making a total of 114 wires. It is the most common rope used for hoisting purposes and is manufactured in all grades of iron and steel, and where sheaves are built to accomodate it, it is the most practical rope to use.

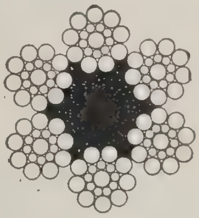


This illustration shows the construction of a wire rope usually termed haulage, transmission or standing wire rope. It is composed of six strands of seven wires each, laid around a hemp center, this making a total of 42 wires. It is constructed in various grades of iron and steel, which grades are suited to different working conditions. These ropes should never be operated over small drums or sheaves, the wires being too coarse.



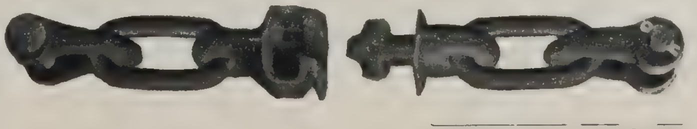
Seale Patent Wire Rope

This is a rope composed of six strands of nineteen wires each laid around a hemp core. Each strand is composed of nine large outer wires, nine small inner wires and one large center wire, as shown in the adjoining cut. By this method of construction a rope is produced which is almost as flexible as a standard nineteen-wire rope, in which all the wires in each strand are the same size, but of greater durability in any service where the rope is exposed to unusual abrasion.



The Monarch Patent Mine Car Hitching

Is applicable to all classes of haulage—Electric, Rope or Mule. It is the result of practical experience and experiment conducted with a view of producing a device for all classes of mine haulage, for all local mine conditions, for adaptability to any car, drawbar or load, and made interchangeable, which obviates the necessity of investment in different sizes. Has no screws, nuts, springs or washers to become lost or loose. It is made of malleable iron, the links and clevises are drop forged. Its entire legth is twenty-three inches. Operated entirely by hand, either in coupling or uncoupling. Absolutely impossible to become detached.



GEORGE C. MOON COMPANY, INC.

124 WHITE STREET, NEW YORK CITY

Works, Garwood, N. J.

Manufacturers of

Wire Rope for All Purposes

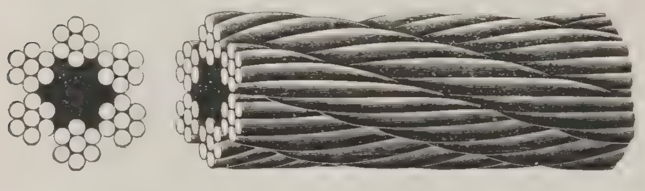
Products

Iron and Steel Wire Ropes of all constructions and grades and Marline Covered Wire Ropes.

The following lists and cuts describe the standard constructions of ropes generally used in the mining field. Our general catalog which will be furnished on request contains full data on all other constructions and grades of rope which we make.

Cresent Haulage Rope

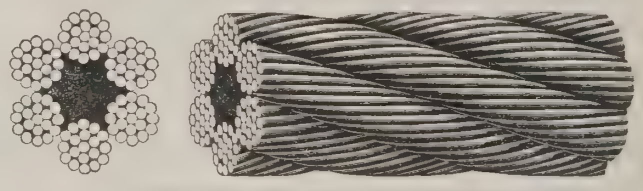
6 strands—7 wires to the strand—1 hemp core.



List Price Per Foot	Diameter in Inches	Circumference in Inches	Approximate Weight Per Foot in Pounds	Approximate Strength in Tons of 2000 Pounds	Proper Working Load in Tons of 2000 Pounds
Cast Steel.					
.36	1⅛	3½	2	37	7.4
.29	1	3	1.58	31	6.2
.22½	⅞	2¾	1.20	24	4.8
.17	¾	2¼	.89	18.6	3.7
.14½	11/16	2⅛	.75	15.4	3.1
.12	⅝	2	.62	13	2.6
.10	9/16	1¾	.50	10	2
.08	½	1½	.39	7.7	1.5
Mild Plow Steel.					
.44	1⅛	3½	2	43	8.6
35	1	3	1.58	35	7
.27	⅞	2¾	1.20	28	5.6
.20	¾	2¼	.89	21	4.2
.17	11/16	2⅛	.75	16.7	3.3
.14¼	⅝	2	.62	14.5	2.9
.12	9/16	1¾	.50	11	2.2
09½	½	1½	.39	8.85	1.8
Plow Steel					
.51	1⅛	3½	2	47	9.4
.41	1	3	1.58	38	7.6
.32	⅞	2¾	1.20	31	6.2
.24½	¾	2¼	.89	23	4.6
.21	11/16	2⅛	.75	18	3.6
.17½	⅝	2	.62	16	3.2
.14½	9/16	1¾	.50	12	2.4
.11½	½	1½	.39	10	2
Improved Plow Steel.					
.58	1⅛	3½	2	52	10
.48	1	3	1.58	42	8.4
.37	⅞	2¾	1.20	33	6.6
.28½	¾	2¼	.89	25	5
.24½	11/16	2⅛	.75	20	4
.20½	⅝	2	.62	17½	3.5
.17	9/16	1¾	.50	13	2.6
13½	½	1½	.39	11	2.2

Crescent Hoisting Rope

6 strands—19 wires to the strand—1 hemp core.



List Price Per Foot	Diameter in Inches	Circumference in Inches	Approximate Weight Per Foot in Pounds	Approximate Strength in Tons of 2000 Pounds	Proper Working Load in Tons of 2000 Pounds	Diameter of Drum or Sheave in Feet Advised
Cast Steel.						
1.16	2	6¼	6.30	106	21.2	8
1.02	1⅞	5¾	5.55	96	19	8
.90	1¾	5½	4.85	85	17	7
.77	1⅝	5	4.15	72	14.4	6.5
.66	1½	4¾	3.55	64	12.8	6
.56	1⅜	4¼	3	56	11.2	5.5
.46	1¼	4	2.45	47	9.4	5
.38	1⅛	3½	2	38	7.6	4.5
.31	1	3	1.58	30	6	4
.24	⅞	2¾	1.20	23	4.6	3.5
.19	¾	2¼	.89	17.5	3.5	3
.14	⅝	2	.62	12.5	2.5	2.5
.12	9/16	1¾	.50	10	2	2.25
.11	½	1½	.39	8.4	1.68	2
Mild Plow Steel.						
1.34	2	6¼	6.3	123	24.6	8
1.25	1⅞	5¾	5.55	112	22.4	8
1.10	1¾	5½	4.85	99	19.8	7
.94	1⅝	5	4.15	83	16.6	6.5
.80	1½	4¾	3.55	73	14.6	6
.68	1⅜	4¼	3	64	12.8	5.5
.56	1¼	4	2.45	53	10.6	5
.46	1⅛	3½	2	43	8.6	4.5
.37	1	3	1.58	34	6.80	4
.29	⅞	2¾	1.20	26	5.20	3.5
.22	¾	2¼	.89	20.2	4.04	3
.16½	⅝	2	.62	14	2.80	2.5
.14	9/16	1¾	.50	11.2	2.24	2.25
.12½	½	1½	.39	9.2	1.84	2
Plow Steel						
1.58	2	6¼	6.8	140	28	8
1.46	1⅞	5¾	5.55	127	25	8
1.30	1¾	5½	4.85	112	22	7
1.08	1⅝	5	4.15	94	19	6.5
.93	1½	4¾	3.55	82	16	6
.79	1⅜	4¼	3	72	14	5.5
.65	1¼	4	2.45	58	12	5
.54	1⅛	3½	2	47	9.4	4.5
.43	1	3	1.58	38	7.6	4
.34	⅞	2¾	1.20	29	5.8	3.5
.26	¾	2¼	.89	23	4.6	3
.19	⅝	2	.62	15.5	3.1	2.5
.16	9/16	1¾	.50	12.3	2.4	2.25
.14	½	1½	.39	10	2	2
Improved Plow Steel.						
1.85	2	6¼	6.30	166	33	8
1.75	1⅞	5¾	5.55	150	30	8
1.60	1¾	5½	4.85	133	27	7
1.30	1⅝	5	4.15	110	22	6½
1.10	1½	4¾	3.55	98	20	6
.90	1⅜	4¼	3	84	17	5½
.75	1¼	4	2.45	69	14	5
.62	1⅛	3½	2	56	11	4½
.50	1	3	1.58	45	9	4
.39	⅞	2¾	1.20	35	7	3½
.31	¾	2¼	.89	26.3	5.3	3
.22½	⅝	2	.62	19	3.8	2½
.19	9/16	1¾	.50	14.5	2.9	2¼
.17	½	1½	.39	12.1	2.4	2

Quality

The quality of the wire of which our ropes are made is of the very highest obtainable and is thoroughly tested by us before being made into rope.

Guarantee

We guarantee our product to be at least equal to any other on the market and will furnish, when requested to do so by the customer, certificate of test.

JOHN A. ROEBLING'S SONS CO.

TRENTON, N J

Also CHICAGO, PHILADELPHIA, PITTSBURGH, CLEVELAND, ATLANTA,
John A. Roebling's Sons Co., of New York, New York.
John A. Roebling's Sons Co., of California.
SAN FRANCISCO, LOS ANGELES, SEATTLE, PORTLAND, ORE.

MANUFACTURERS OF

WIRE ROPE

General

The first wire rope used in this country was a Roebling rope. Since its production the manufacture of wire rope has never been interrupted, and as the demand has increased the facilities for production and distribution have expanded so that the Roebling Company now has three works (two at Trenton, N. J., and one at Roebling, N. J.) and has also numerous branches in different parts of the country.

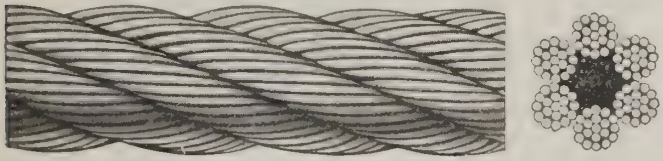
Stocks are kept at warehouses in connection with the branches and these can be drawn on for prompt shipments.

For detailed information apply to any address named above.

Products

Over 400 different sizes and constructions of wire rope are made at the Roebling works. Wire Rope Fittings such as hooks, sockets, etc., are also made and kept in stock for prompt deliveries.

None but carefully selected and thoroughly tested metals are used for Roebling rope. There are several grades of these metals. Those most commonly used are briefly described below.



Rope with 6 Strands of 19 Wires each and a Hemp Center.

Blue Center Steel Rope

Recent advances in the manufacture of steel have made possible the production of a grade particularly well adapted for rope wire, and excelling all others in strength and toughness.

Where conditions are such that the maximum of strength for a given diameter of rope must be obtained, or severe abrasive tendencies exist, blue center steel should be specified.

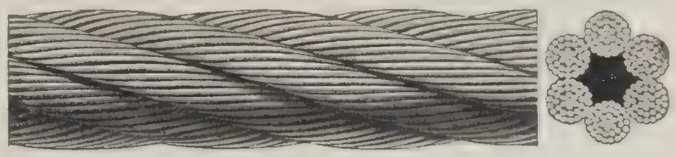
The largest haulage rope ever made (in use on the Mayari Inclines of the Spanish American Iron Co.,) is a Roebling blue center steel rope. The same is true of the biggest rope used in digging the Panama Canal.

Blue center steel rope is not only well adapted for ropes of unusual size, but it will give the maximum service in the ordinary diameters. To distinguish it from others, blue ceter steel rope is always made with **a blue hemp center.**

Plow Steel

Up to the time of the production of blue center steel, the strongest and toughest rope was made of plow steel.

Plow Steel comes next in strength to blue center steel and may be used in place of the latter if the maximum strength for the diameter is not essential or if it is not considered necessary to take advantage of the extra power of resistance to abrasion of blue center steel.



Rope with 6 Strands of 37 Wires each and a Hemp Center.

Extra Strong Cast Steel

Extra Strong Cast Steel Rope occupies an intermediate place between cast steel and plow steel. It can be used to advantage in place of cast steel under conditions suitable for the latter, when it is desired to increase the safety of a rope of given diameter.

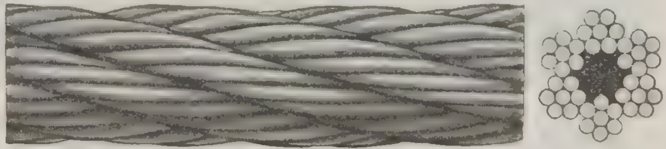
Cast Steel

Rope made of cast steel is used largely for mine hoists and haulages, and on coal hoists, cableways and conveyors. While cast steel does not have the strength per square inch of the other steels referred to above and lacks the resistence to abrasion of plow or blue center steel, conditions often exist where for a given diameter of rope the stress is not beyond the working strength of cast steel and its wearing qualities are amply sufficient.

In contemplating the selection of a wire rope, if doubt exists as to the grade, we shall be glad to make suggestions on being advised of conditions.

Iron

Iron Rope is used mostly for the operation of the drum type of passenger elevators. It is the best rope for that purpose, but being softer it lacks the strength of steel rope and will not resist abrasion as well. Iron Rope therefore is not economical to use under conditions generally encountered in mining.



Rope with 6 Strands of 7 Wires each and a Hemp Center.

Standard Constructions

The standard construction for hoisting rope is six strands of 19 wires each and a hemp center; for haulage rope, six strands of 7 wires each and a hemp center.

To obtain greater pliability in hoisting rope it is sometimes made of six strands of 37 wires each, or eight strands of 19 wires each.

WATERBURY COMPANY

63 PARK ROW

NEW YORK CITY

MANUFACTURERS OF

Wire and Fibre Rope for Operation of Mines and all General Uses

FACTORY—Brooklyn, N. Y.

BRANCHES

419 W. 12th Place, Chicago, Ill.
220 Franklin Street, Boston, Mass.
113 Davis Street, San Francisco, Cal.
911 Southwestern Life Bldg., Dallas, Texas.
1018 Maison Blanche Bldg., Canal and Dauphin Sts., New Orleans, La.

Products

Wire Rope, Manila and Sisal Rope, Non-Rotating or Non-Spinning Rope, Marline Covered Wire Rope, known as Fibreclad; Waterbury Armored Rope (Gore Patent March 14, 1911).

Waterbury Wire Rope

Is made in grades known as Swedish Iron, Crucible Cast Steel, Extra Strong Cast Steel, Plow Steel and Green Strand Giant Steel, the latter being the highest grade of Improved Plow Steel.

Mining Ropes

The importance of best quality ropes cannot be overestimated owing to the severity of work and danger to life. The size of rope or class of material depends largely on the character of operation, such as hoisting or haulage. Our Engineering Department will gladly render assistance in determining questions as to the most suitable rope for use, in case of incline planes, subdivided into gravity and self-acting systems, engine or power planes, tail ropes or endless rope systems.

Waterbury Armored Wire Rope (Gore Patent Mar. 14, 1911)

Is made 6 strands, 19 wires to the strand, 37 wires to the strand or 61 wires to the strand, according to size and conditions of use. It is furnished in Crucible Cast Steel, Extra Strong Cast Steel, Plow Steel or Giant Improved Plow Steel stock.

The strands in this class of rope are wound or served with flat wires having convex edges, which wires take the abrasion on crown of strands. The initial factor of safety is maintained longer in Waterbury Armored Rope than in any other class of rope. It is most suitable for mining purposes, and particularly so for haulage operations. Waterbury Armored Rope has the advantage over rope of ordinary construction inasmuch as wear on crown strands does not commence until the serving has worn down, and after that period such wire serving becomes packed into the interstices of rope, making it cylindrical and thus materially increasing the efficiency of the rope. A cylindrical rope is less subject to wear on crown strands than rope of ordinary construction.

Fibreclad Marline Covered Wire Rope

A combination rope of wire and the best grade of Tarred Russian Hemp Marline. It replaces Manila or Wire Rope for transmitting power at coal washers, coal breakers or wherever Wire or Manila Rope is used for power transmission purposes. The Tarred Marline affords protection against acid water and moisture, foreign matter, such as coal dust and residue, always prevalent where rope drives are in use. It is not affected by atmospheric conditions, as in the case of Manila Rope or Wire Rope. It is about one-third the diameter of Manila Rope of the same strength. Is flexible and will coil down as readily as Manila Rope. Will outwear bare wire rope under most all ordinary working conditions, likewise Manila Ropes, consequently is more satisfactory in the end. Is also used largely for hoisting and other purposes.

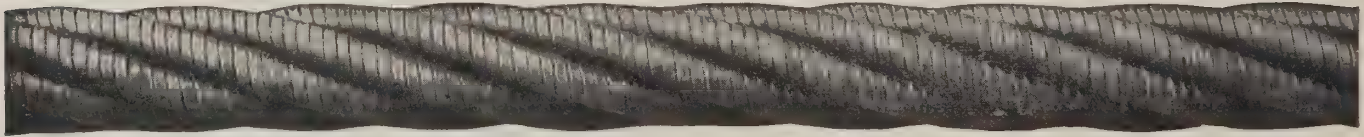
Manila and Sisal Rope (for General Use)

Manila Transmission Rope

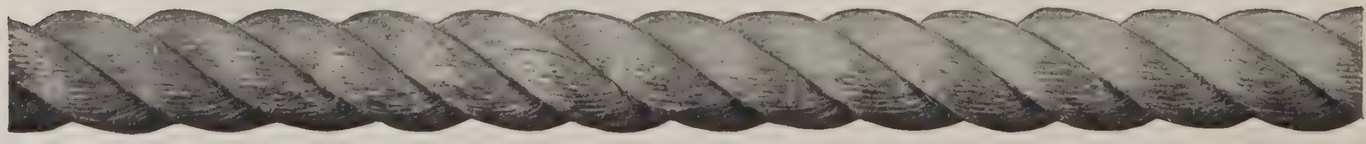
We make a special rope for power transmission purposes, made from the best selected Cebu Manila Hemp. Transmission Ropes are made 4 strands with heart, unless otherwise ordered. The yarns are treated with a special composition, which thoroughly lubricates the strands and individual fibres, making the rope as near waterproof as possible. Our Transmission Rope is especially adapted for rope driving and made as nearly perfect as the best machinery, superior quality of material and wormanship can produce.

Ask for prices, samples or other particulars.

Waterbury "Green Strand" Giant Steel Wire Rope. Write for Wire Rope Catalog.



Waterbury Armored Rope (Gore Patent). Write for Armored Rope Catalog.



Waterbury Fibre Rope—Manila and Sisal. Write for Fibre Rope Catalog.

Waterbury Fibreclad Wire Rope. Write for Fibreclad Wire Rope Catalog.

WRIGHT WIRE COMPANY

Worcester, Mass.

Manufacturers of

Wire, Wire Rope and Wire Products

Branch Offices:

Boston.................................256 Franklin St.
New York...............................256 Broadway.
Philadelphia..........................410 Commerce St.
Chicago...............................33 West Austin Ave.
San Francisco.........................111 Townsend St.

Products

Wire Rope; Wire Fencing; Wire Cloth; Wire Lathing; Iron and Steel Wire; Staples; Poultry Netting; Screen Cloth; Ornamental Iron Work of Iron, Brass, or Bronze, such as Elevator Cabs, Gratings, Railings, Window Guards, Gates, Bank and Office Fixtures. Also all kinds of Grille Work; Wire Partitions; Stock and Tool Room Enclosures; Machinery Guards; Stable Fittings; Clothes Lines; Picture Cord; Coal and Sand Screens, and Foundry Riddles.

Excelsior Wire Ropes are made from specially selected materials in a wide variety of types to meet every engineering need.

Materials

We furnish rope of iron, crucible cast steel, extra strong crucible cast steel, plow steel, and Excelsior plow steel.

The wire is drawn in our own mills under rigid supervision and the greatest care is used in the making of the rope.

Construction

The standard construction for hoisting rope is 6strands of 19 wires each laid about a center core of hemp. Where extra flexibility is desired 6 strands of 37 wires each may be employed.

Haulage rope has usually 6 strands of 7 wires each about a hemp core. This core is thoroughly saturated with a special compound to lubricate the wires and prevent rust.

Uses

We supply ropes for hoisting, haulage, derricks, dredges, power transmission, cableways, tramways, suspension bridges, and all purposes where wire rope can be utilized to advantage.

Fittings

We furnish a full line of wire rope fittings, such as sockets—both open and closed—hooks, thimbles, turn buckles, clamps, etc.

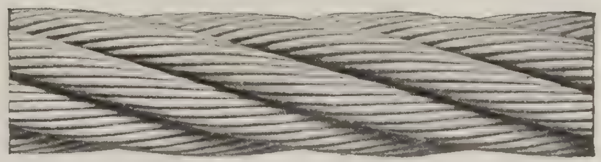
How to Order Wire Rope

In ordering be sure to state:

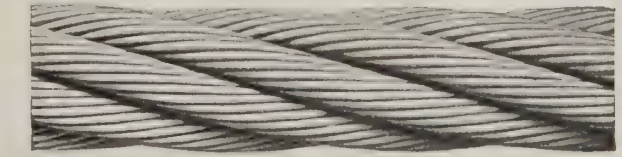
1. The diameter of the rope required.
2. Its exact length.
3. The number of strands.
4. The number of wires per strand.
5. The purpose for which it is to be used.
6. The stock from which it is made.

If uncertain what rope is best suited to your needs, state fully the use to which it will be put, giving details of loads, speed, and size of drums or sheaves.

Standard Haulage Rope.
6 strands of 7 wires each around hemp core.



Standard Hoisting Rope.
6 strands of 19 wires each around hemp core.



Special Flexible Hoisting Rope.
6 strands of 37 wires each around hemp core.

THE TEXAS COMPANY

NEW YORK HOUSTON

Petroleum and Its Products

The Preservation of Wire Rope

In these days the preservation of wire rope is assuming greater importance than ever before.

A rope which was formerly considered as just so much steel, is now coming to be understood and regarded as the intricate machine which it actually is.

It may surprise the average rope user to learn that 100 feet of 1″ wire rope shows a frictional surface which should—and CAN be lubricated, totaling 344 square feet. The true magnitude and the importance of this figure can be realized by comparison to the frictional surface on what is practically the largest engine in the United States.

This is a 35,000 H.P. engine of the Twin-Tandem Reversing Type, in use in a large steel mill and, incidently, lubricated with TEXACO LUBRICANTS. This engine has a total frictional area, including cylinder walls, valves, and all bearings of 319 square feet. In other words a mere 100 feet of wire rope has more surface to be lubricated than this huge engine. The wonder is that unlubricated or improperly lubricated wire ropes last as long as they do.

What We Have Accomplished

The engineers of The Texas Company have contributed much to the science of rope lubrication and preservation. Careful study and costly experiments extending over many years were required to reach our present status in this field.

Long ago we realized that we had a wire rope lubricant of unequalled efficiency, but we spent years of study in ascertaining the best methods of applying it before we marketed TEXACO CRATER COMPOUND. Now, we have encountered every known wire rope and gear condition in coal mine work, and can predicate the way in which TEXACO CRATER COMPOUND will meet each one.

What is Texaco Crater Compound ?

First. TEXACO CRATER COMPOUND is a straight heavy lubricant of unparalleled excellence for wire ropes. It contains no filler, such as rosin, tar, tallow, graphite, etc.

CRATER does what no other product on the market can. It COATS the rope, PENETRATES between the strands, saturates the core, and LUBRICATES. TEXACO CRATER COMPOUND clings to metal surfaces. It cannot be shaken from the rope by vibration or shock. It will not run, throw off, or drip. It is impervious to mine acids, weather, or water. It resists heat as well as cold. It does not harden, crack, nor flake, and it remains a lubricant at all times.

We ran a test on this water hoist. Rope laid up in and treated with "CRATER" hoisted 101,815 buckets. Two previous ropes hoisted 58,483 buckets, average. All ropes from the same rope maker.

Why Ropes Fail—How to Save Them

The lifting strain alone does not cause wire rope to fail—the main factors which do are corrosion and frictional wear—almost always internal. TEXACO CRATER COMPOUND saves the rope. It prevents corrosion, checks friction, stops wear. The next page explains fully.

How Texaco Crater Compound Saves Wire Ropes

How Crater Stops Wear

The fine coating of heavy lubricant given to every wire by "CRATER" means that wear due to the friction of drums and sheaves in stopped. But, what is more important is that internal wear is checked.

When the rope is laid up in CRATER, i. e., when the wires are coated in laying up and the hemp core is saturated with it, this core acts as a reservoir for the lubricant. Extra strains such as longitudinal stresses or the pressure caused by bending over or under the sheave wheel, or around the drum, serves to squeeze out a little of the lubricant and force it between the wire strands. Thus, the twisting and cutting action of the wires is performed on a film of CRATER and not upon each other. The wear is stopped. The rope lasts longer.

Furthermore, when a rope so treated is given frequent coatings, the outer as well as the inner strands will be continually lubricated, and a rope so treated will show a doubled length of life.

Prevents Corrosion

The saline or heavy sulphur and acid water met in mines attacks the metal. It is corroded and eaten away. The strands of the rope become thin and brittle, breakage occurs. Too often this is inside the rope and it is only discovered when the rope fails.

The outside may be whole and unworn, but the continuous contact with a moist tainted core often ruins the inner strands in a short time. If the core of that rope were saturated with CRATER, the acid water would have no effect upon it, and if the outside of the wire were coated with CRATER, the mine water would not have any effect upon them whatsoever.

That is why CRATER treated ropes last so much longer. A fine example of the resistance to corrosion afforded by CRATER was furnished by a performance on one of the water buckets of a large Pennsylvania coal mine. The acid water corroded the buckets, especially at the rivets. We coated the buckets with CRATER. Seven months later the coating was still intact. All this exposure to acid water, plus the dripping action in the sump, could not dislodge the protective acid-proof coating of TEXACO CRATER COMPOUND. Think how it will protect your wire rope.

When You Order New Rope Specify That It Be Laid Up in Texaco Crater Compound.

All the larger wire rope manufacturers will be glad to lay up your wire rope in TEXACO CRATER COMPOUND during the process of manufacture. It means that this rope is protected from the start. It means that you can readily apply the necessary light coatings to keep the rope in prime condition. It means that your wire rope will last longer, frequently more than twice as long. Specify TEXACO CRATER COMPOUND. It pays.

How To Apply

To secure proper results, the TEXACO CRATER COMPOUND is applied hot, and by means of a split box. This box serves as a container for the compound. An old rubber valve, or even a piece of burlap at the base of the box serves to hold the lubricant. The rope is run through the box slowly, and a clean light coating is secured. We will gladly furnish blueprints and descriptions of this simple and efficient contrivance for hoist or slope ropes.

Some Other Uses For "Crater"

As a gear dressing CRATER is without a rival. It's rich lubricating quality and its adhesiveness to metal surfaces mean that the teeth of gears are coated and lubricated. Wear and abrasion are stopped. Because water, acids, and the elements do not effect CRATER, operators are using it as a protection against corrosion on buckets and on iron and steel work around the mine. Because of its resistance to heat and gases, it has been used to preserve the INSIDE of iron smoke stacks.

And further proof of its high resistance to moisture and heat is shown by its use on the flanges and packings of steam lines with eminent success.

TEXACO CRATER COMPOUND is shipped in wooden barrels about 400 lbs. each, half barrels, and 25-lb. cans. Write us fully for prices at your mine and for further particulars. Remember also, CRATER is but one of a long line of the quality petroleum products we make. Some of the others are:

TEXACO CYLINDER OILS.
TEXACO MACHINE OILS.
TEXACO MINE CAR LUBRICANTS.
TEXACO MINERS WAX.
TEXACO BURNING OILS.
TEXACO NAPHTHAS.
TEXACO ROOFING, and many others.

We will thank you to address all inquiries to us at Department K., 17 Battery Place, New York City.

THE BURNET COMPANY

69 South Street
NEW YORK

What Is Worth Buying Is Worth Protecting

COTRO-PINE—
For Manila Transmission Rope

Exposure to moisture means short life to your rope.

THE BURNET COMPANY
69 SOUTH STREET
NEW YORK CITY
"COTRO-PINE"
"COTRO-PINE"
FOR PRESERVING AND LUBRICATING MANILLA OR COTTON TRANSMISSION ROPES
"COTRO-PINE"
DIRECTIONS
Hold bar endwise against moving rope until the rope is properly coated

For Transmission Rope.

Rope dried out is brittle, the fibre ends harden, work their way to the surface and break off.

Cotro-Pine forms a coating on the surface of rope, repels moisture and preserves the original condition of the interior.

Allow us to demonstrate our ability to reduce your rope expense.

These products on market over 20 years. Original users still our customers.

BURNET IMPROVED CABLE COATING—
For Mine, Hoisting and Haulage Rope

Burnet Improved Cable Coating penetrates the rope, preserves the core and keeps interior strand-wear down. At the same time it forms an exterior coating, preventing corrosion in contact with mine water and abrasion of surface where rope drags, wear of rope upon sheaves and wear of sheaves.

Burnet Improved Cable Coating, because chemically neutral, has no detrimental effect on interior or exterior of rope and is an efficient resistant of all injurious effects of the elements.

A Grade For Each Use or Condition.

Grade "A" (Light) Designed for Shaft Ropes and others that travel at a high speed.

Grade "B" (Medium) and Grade "C" (Heavy) Designed especially for haulage and slope ropes, or where there is much "rub".

For Wire Rope.

SAMPLES SENT FREE ON REQUEST.

KEYSTONE
THE.
MINING
CATALOG
COMBINED WITH
COAL FIELD
DIRECTORY
CONSOLIDATED PUBLISHING
COMPANY INC.

MINE CAR SECTION

Engineering Data

Mine Car Specifications

The following manufacturers have catalogue descriptions in this section:

American Car & Foundry Co.
Duncan Fdry. & Machine Co.
Enterprise Foundry & Mch. Works.
Fulton Pit Car & Mfg. Co.
Graham Nut Co.
Gustafson Mfg. Co.
Hockensmith Wheel & Mine Car.
Hyatt Roller Bearing Co.
Irwin Mine Car & Fdry Co.
Kanawha Mfg. Co.
Kenova Mine Car Co.
Lobdell Car Wheel Co.
McKay, James Co.
Mines Otolok Check Co., Inc., The.
Orenstein-Arthur Koppel Co.
Phillips Mine & Mill Supply Co.
Pittsburgh Knife & Forge Co.
Pressed Steel Car Co.
Sanford-Day Iron Works.
Southern Wheel Co.
Standard Chain Co.
Star Mfg. Co.
Watt Mining Car Wheel Co.
Youngstown Steel Car Co.

For additional descriptions of Mine Cars and Equipment, not appearing in this section, refer to Index of Products in front of book.

Specifications for Mine Cars

TYPE—

Over-hang Sides

Sloping Sides

Straight Sides

CONSTRUCTION—

All Steel

Steel with wood floor

All wood

CAPACITY—

Required

Gauge of Track . . . .in.

Diameter of Wheel, Exclusive of Flange ....in.

KIND OF WHEEL—

Self-Oiling Capless?

Ring Oiling Capless?

Roller Bearing?

Plain Wheels with Rollers in Boxes?

KIND OF AXLE—

Round?

Square?

Size of Axle . . . .in.

“ “ Iron Front Binder . . . .in.

“ “ “ Center “ . . . .in.

“ “ “ Rear “ . . . .in.

“ “ “ Draw Bar . . ..in.

Diam. of Coupling hole in Draw Bar ....in.

Send rough Sketch of draw bar.

Width of Car clear inside at top . ...in.

Depth of Car clear inside . . ..in.

Length of Car clear inside . . ..in.

Length Car overall including Bumpers ....in.

Height Car overall above top of rail ....in.

THICKNESS OF MATERIALS—

Sides . . . .in.

Bottom . . . .in.

Distance to center of Axles, (Wheel Base) . . . .in

Send rough sketch and dimension of Bumpers.

DO YOU WISH BRAKE—

Single?

Double?

If Single Brake, on which side when facing car from rear?

STYLE OF DOOR—

Lift Door?

Gate hinged at Top?

Gate hinged at Side?

Send rough sketch and dimensions of Couplings.

U. S. STANDARD SYSTEM OF BOLTS AND NUTS

As Recommended by the Franklin Institute, of Philadelphia, December 15, 1864.

Diameter of Bolt	Number of Threads per Inch	Diameter of Hole in Nut	Short Diameter of Nut*	Diameter of Bolt	Number of Threads per Inch	Diameter of Hole in Nut	Short Diameter of Nut
¼ in.	20	.185	½ in.	2 in.	4½	1.712	3⅛ in.
5/16 “	18	.240	19/32 “	2¼ “	4½	1.962	3½ “
⅜ “	16	.294	11/16 “	2½ “	4	2.175	3⅞ “
7/16 “	14	.344	25/32 “	2¾ “	4	2.425	4¼ “
½ “	13	.400	⅞ “	3 “	3½	2.628	4⅝ “
9/16 “	12	.454	31/32 “	3¼ “	3½	2.878	5 “
⅝ “	11	.507	1-1/16 “	3½ “	3¼	3.100	5⅜ “
¾ “	10	.620	1¼ “	3¾ “	3	3.317	5¾ “
⅞ “	9	.731	1-7/16 “	4 “	3	3.566	6⅛ “
1 “	8	.837	1⅝ “	4¼ “	2⅞	3.825	6½ “
1⅛ “	7	.940	1-13/16“	4½ “	2¾	4.027	6⅞ “
1¼ “	7	1.065	2 “	4¾ “	2⅝	4.255	7¼ “
1⅜ “	6	1.060	2-3/16 “	5 “	2½	4.480	7⅝ “
1½ “	6	1.284	2⅜ “	5¼ “	2½	4.730	8 “
1⅝ “	5½	1.389	2-9/16 “	5½ “	2⅜	5.053	8⅜ “
1¾ “	5	1.490	2¾ “	5¾ “	2⅜	5.203	8¾ “
1⅞ “	5	1.615	2-15/16“	6 “	2¼	5.423	9⅛ “

* Or Size of Wrench.

Duncan Foundry & Machine Works

ALTON, ILL.

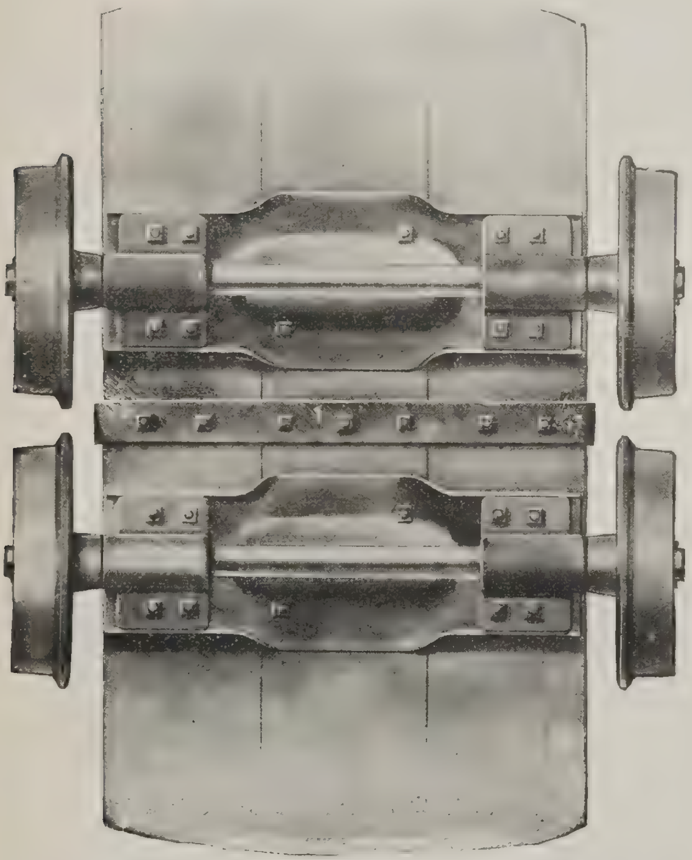
Manufacturers of

MINING MACHINERY

Products

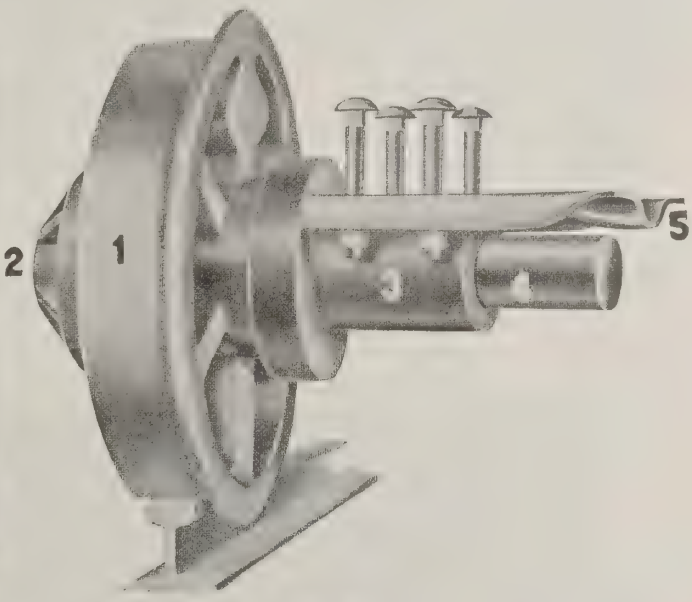
We manufacture the following: Mine Cars; Self Oiling, Roller Oiling and Plain Wheels; Roller Bearing Wheels; Car Irons; Shaker Screens; Revolving Screens; Self Dumping and Plain Cages; Weigh Hoppers; Etc.

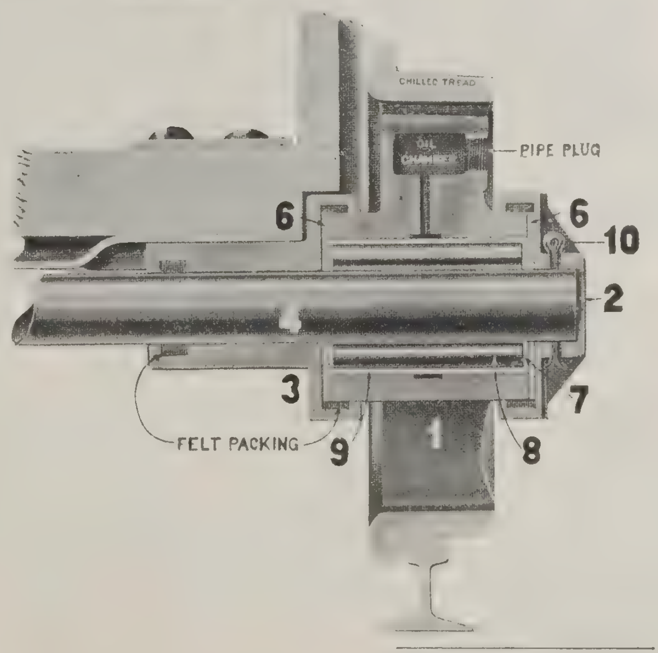
Duncan Hercules Truck
is constructed with pressed steel channels that hold the boxes in perfect alignment, running all the way across the car and thus preventing them from getting out of line. It has the bolts running through the bottom of the car, going through the axle boxes, pressed steel channels and wooden bottom, and the heads are protected on the inside of the car by a washer also, which does not allow the bolts to wear the wood and cause the axles to get out of line. The pressed channels are not of the ordinary rolled type channel, but are made from ¼″ plate, and the deformed part of the channel in the center gives it greater strength and also wider bearing on the bottom of the car, allowing the bolts to be placed further apart and giving a greater rigidity than is accomplished by the ordinary rolled channel section. The deformed part of the channel that is formed in the center takes the place of the flanges ordinarily used, and in addition to this gives it greater strength owing to the width of this deformed section. The flanges that come in contact with the boxes are driven down tight on either side of the axle box when the car is assembled, and there is no play between the channel and the box.



Duncan Roller Bearing Wheel

A special feature of this wheel are the loose steel washers No. 6, as shown in cut, which go in the front and back of the wheel hub, also the axle boxes project over the hub of the wheels and are felt packed preventing the entrance of dirt and the loss of grease, as is also the case with the wheel cap on the front end of the wheel. The axles are cold rolled steel, and the cages used in the wheels are constructed so that the five bars are riveted through the washer on either end making a very rigid cage which cannot be forced apart by the action of the rollers.





AMERICAN CAR & FOUNDRY CO.

General Offices

New York · Chicago St. Louis

Address for Mine Equipment, our Plant at
BERWICK, PA. or HUNTINGTON, W. VA.

Manufacturers of

All Kinds of Wood, Steel, or Composite Mine and Clay Cars.

Dump Cars.

Logging Cars.

Industrial Cars.

Railway Cars—For Freight and Passenger Service.

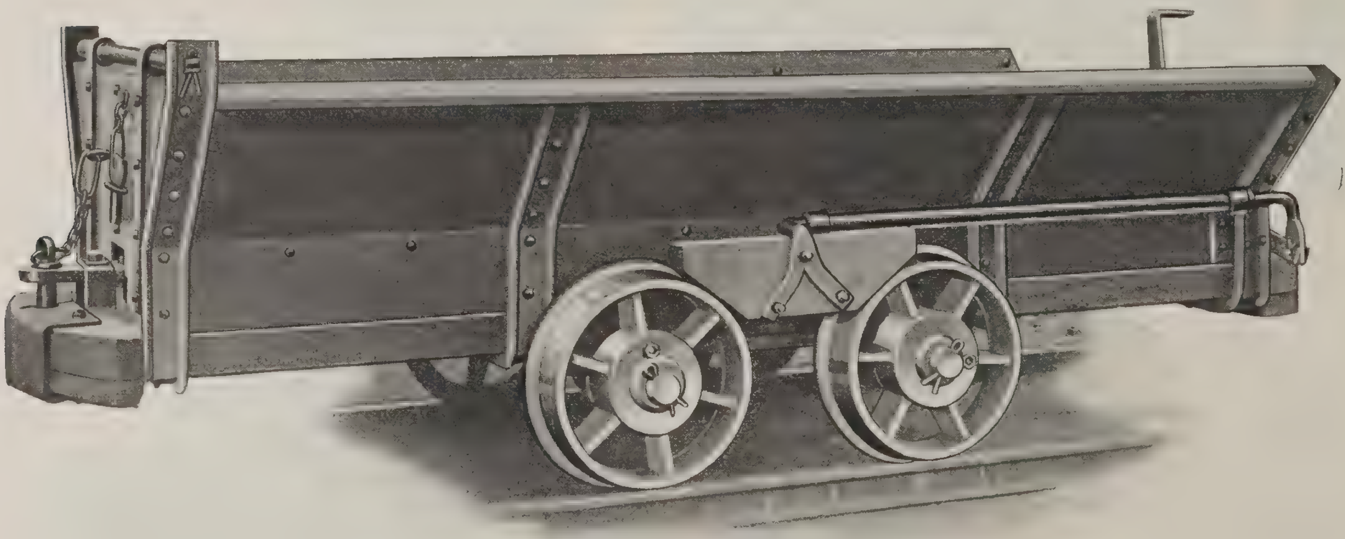
Bar Iron and Forgings.

Mine Car Trucks with Plain or Roller Bearing Wheels.

Chilled Iron Wheels of All Kinds for Mine, Motor, Street, and Freight Cars.

Cast Iron Flange Pipe and Fittings.

General Foundry and Machine Work.

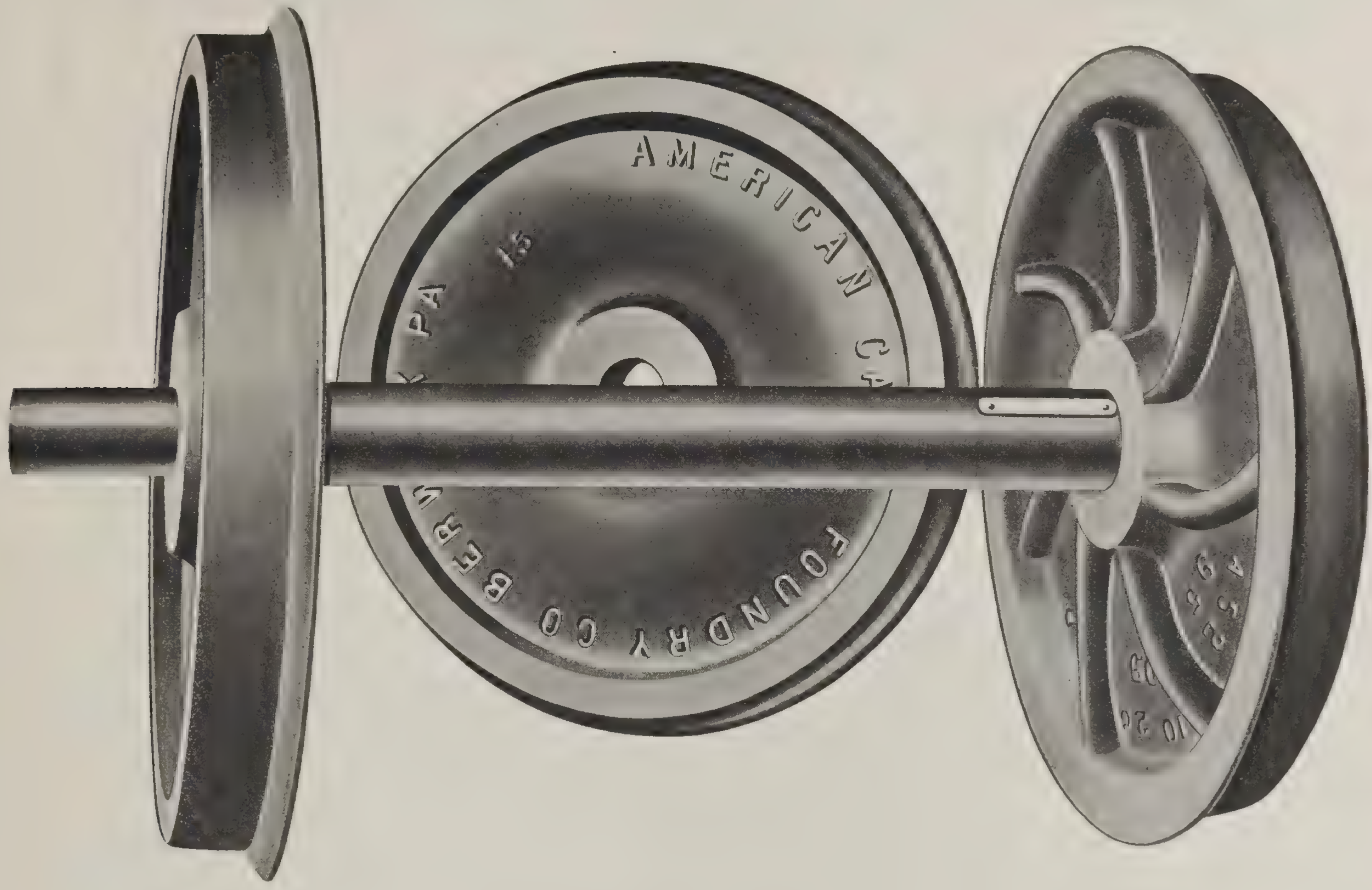


Composite Steel & Wood Mine Car, Capacity 1 Ton, 5 Cwt.

Features—Sectional sides if desired, making easy to repair, pressed roll at top, wood floor, channel section body bands.

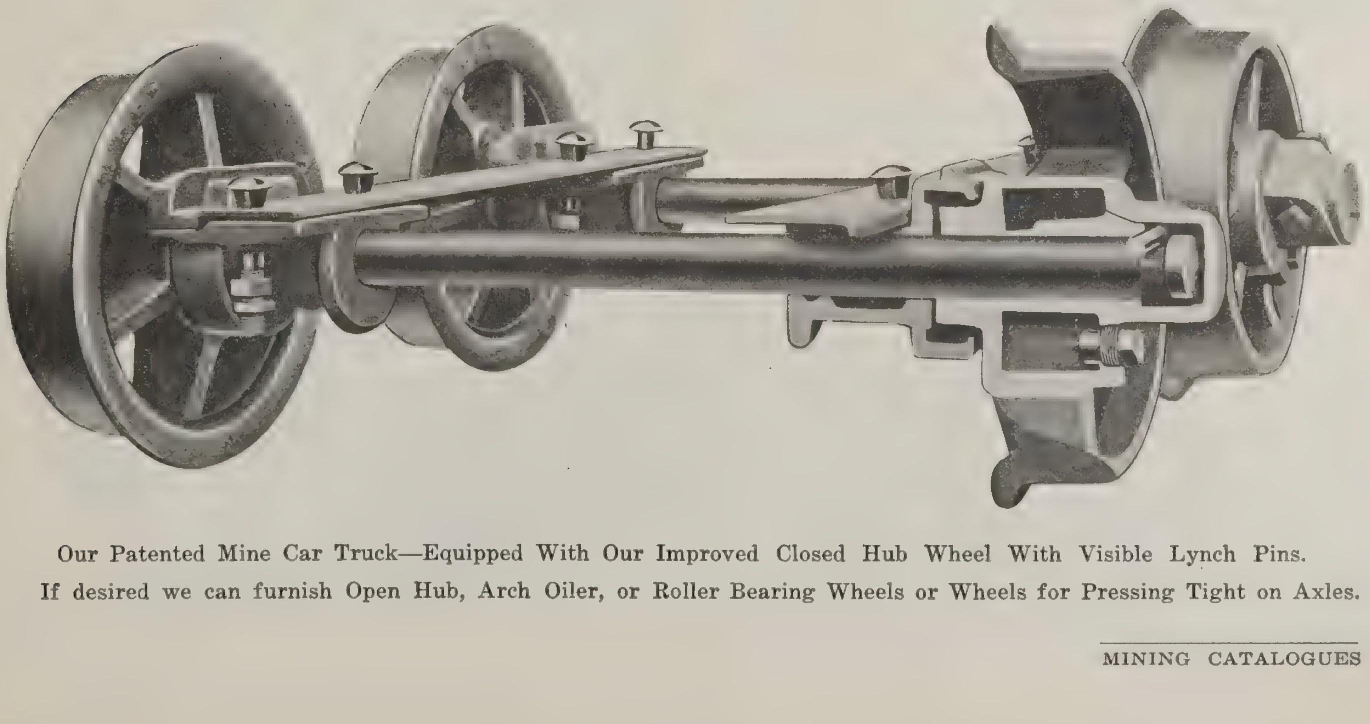
Bumpers—Either round or square—Our Standard round axle truck.

We are prepared to make any type of car desired, either designed to suit your requirements or made from your own drawings.



Wheels for Electric Mine Motors.

We are prepared to furnish New Wheels and Axles complete—Making a specialty of Refitting New Wheels on Old Axles. These wheels are cast in the same foundry and the same iron used as in wheels we make to meet P. R. R. specifications. All patterns in stock.



Our Patented Mine Car Truck—Equipped With Our Improved Closed Hub Wheel With Visible Lynch Pins.

If desired we can furnish Open Hub, Arch Oiler, or Roller Bearing Wheels or Wheels for Pressing Tight on Axles.

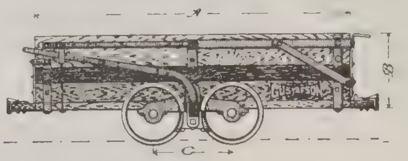
GUSTAFSON MANUFACTURING CO.

CHATTANOOGA, TENN.

TRADE
MFD BY
GUSTAFSON
MFG CO
MARK

Engineers, Founders, Machinists

Good News
is what you hear when you are using Gustafson Rolling Stock, etc.



We make a specialty of "Gustafson LEADER,, Chilled Tread ROLLER BEARING MINE CAR WHEELS, "Gustafson LEADER" Chilled Tread Self-Oiling Mine Car Wheels, PRESSED STEEL MINE CAR TRUCK FRAMES, Mine Cars, either wood or steel; Contractors' Cars, Circular Dump Cars, Incline Cars, Incline Rollers and special high-grade car castings, either in semi-steel or other special mixtures for making strong castings; Motor Wheels, Sheave Wheels, etc.; also axles for all kinds of narrow-gauge industrial cars, etc.

Gustafson "Rapid Fire" Car Wheel Oiler

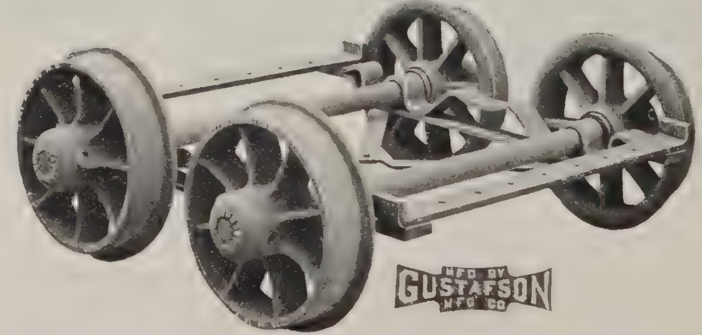
is the easiest and quickest device for oiling all kinds of open hub mine car wheels, and each oiler will save barrels of oil each month.

It is clean in operation and very convenient. It is simply a single-acting Spring Pump attached to a gallon can substantially made and guaranteed.

The Gustafson Leader Roller Bearing Wheel

is properly balanced—is fastened to axle by two loose steel pins inside of wheel and engaging each side of groove near the end of axle. This device is stronger than any other type of wheel lock, and the wheel can be easily taken off and replaced on axle without the necessity of having car turned over.

These wheels, in combination with our Pressed Steel MINE CAR TRUCK FRAMES, which are adapted to any type of wood bottom mine car, make a combination that has proven money makers wherever used.



ENTERPRISE FOUNDRY & MACHINE WORKS

Mine Wheel Department

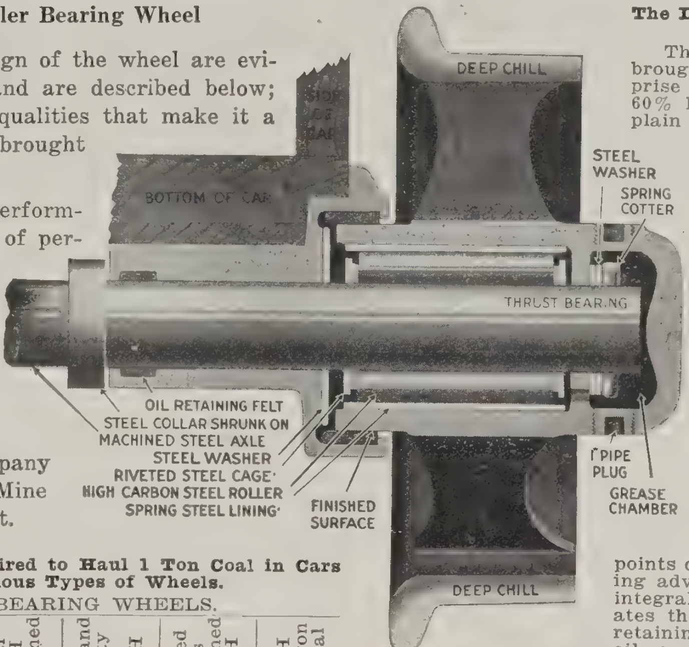
OFFICE AND WORKS: BRISTOL, TENNESSEE

Manufacturing Enterprise Chilled, Annealed, Self-Oiling, Roller Bearing Car Wheels for Mines and Industrial Railways. Car Trucks of All Types to suit every condition and service.

The Enterprise Improved Roller Bearing Wheel

The construction and design of the wheel are evident from the illustration, and are described below; the **unseeable** metallurgical qualities that make it a remarkable wheel will be brought out later.

But the actual, attested performance of the wheel—the kind of performance that is guaranteed by the contract reproduced below—is of first interest and importance to mining men. We, therefore, show that first. The test was made by engineers of the Stonega Coal & Coke Company on April 24th, 1915, at Mine No. 4 of the Roda, Va. Plant.



Test to Determine KWH Required to Haul 1 Ton Coal in Cars Equipped With Various Types of Wheels.

Run	Average Min. Elapsed Time	Total KWH Consumed	Motor and Empty Cars KWH	Loaded Cars Consumed KWH	KWH Per Ton of Coal
BUSHED PLAIN BEARING WHEELS.					
No. 1	8. sec.	7.2	1.8	5.4	.18
No. 2	7.25 sec.	7.6	1.8	5.8	.193
Average	7.42 sec.	7.4	1.8	5.6	.1865
WELL KNOWN ROLLER BEARING WHEEL.					
No. 1	6.40 sec.	5.4	1.8	3.6	.12
No. 2	6.25 sec.	4.6	1.8	2.8	.093
No. 3	6.25 sec.	3.8	1.8	2.	.066
Average	6.30 sec.	4.6	1.8	2.33	.093
ENTERPRISE ROLLER BEARING WHEEL.					
No. 1	6.45 sec.	4.4	1.8	2.6	.086
No. 2	6.05 sec.	4.4	1.8	2.6	.086
No. 3	5.30 sec.	3.6	1.8	1.8	.060
Average	6.06 sec.	4.13	1.8	2.33	.077

Test made at Roda plant of Stonega Coke and Coal Company in Mine No. 4 on Main Line Haulage, 35 lb. Steel, well bonded for whole 3000 ft. (3000′) track; in fair condition for average haulway; 200′ Rad. Curve 200′ long.

Grades

1200 ft. 2 to 3% Adverse.
700 ft. 1 to 2% Adverse.
800 ft. Level.
300 ft. 1 to 2% Favorable.

Motor used, G. E. Type HM 709. 13 Ton 136 HP.

All wheels of different types in good average condition.

Weight of Cars, Total 30,000 lbs. Weight of Coal, 60,000 lbs. Total load 90,000 lbs, or 45 tons net total load.

W. S HOBBS,
D. B. SAYERS,
G. B. SOUTHWARD,
H. B. PRICE, Jr.,
SHADE BANKS,
Stonega C. and C. Co.
Roda, Va., April 24, 1915.

The Lesson of the Test

This careful watt-hour-meter test brought out conclusively that Enterprise Roller Bearing Wheels require 60% less power to haul than the best plain bearing (brass bushed) wheels; that another high grade roller bearing wheel requires fifty per cent less power—**ten** per cent **more** than Enterprise Wheels.

This shows Enterprise Wheels to effect a power-saving of **twenty** per cent even over the other high grade roller bearing wheel.

The advantage that is given Enterprise Wheel users in these exclusive power-saving qualities goes without saying.

Mechanical Features

The chief feature is the perfectly balanced design, which keeps the center-line of load always over the center of the roller bearing.

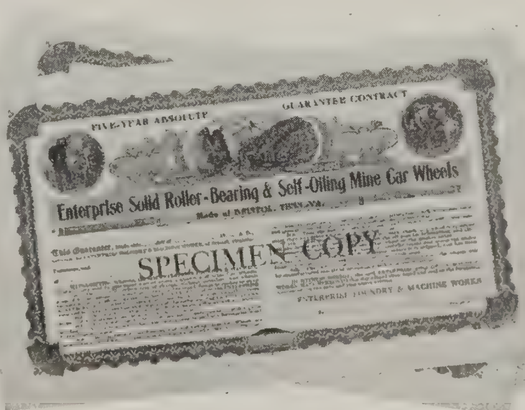
Details of construction are noted on the engraving; and points of design that are of great operating advantage are (1) the hub cap cast integrally with the wheel—which eliminates the danger of its loss; (2) the oil retaining features, due to the fact that oil cannot leak through solid metal; (3) the long axle bearing, which relieves the carbody of running strains.

Metallurgical Features

The iron mixtures and depth of chill are obtained under the personal supervision of ASA W. WHITNEY, the grandson of the founder of the chilled wheel industry. This company, through him, has at its disposal the complete metallurgical records of A. Whitney & Sons, and of this company, dating back to 1847. Enterprise Wheels, then, have behind them the accumulated experience of 68 years of chilled-wheel making.

The Guarantee

This is reproduced below. It is the most liberal and far-reaching of any guarantee ever signed by a wheel maker. It makes absolutely impossible anything but a satisfactory and profitable investment. It is an iron-clad assurance of the fact that Enterprise Wheels make good, and cannot do otherwise.



FIVE-YEAR ABSOLUTE GUARANTEE CONTRACT

Enterprise Solid Roller-Bearing & Self-Oiling Mine Car Wheels

Made at BRISTOL, TENN.-VA.

SPECIMEN COPY

ENTERPRISE FOUNDRY & MACHINE WORKS

This is a **signed** 5-year contract with the buyer, absolutely and unqualifiedly guaranteeing perfect **wheel service.**

In Conclusion

Every mining man interested in rolling equipment should be thoroughly familiar with the all-embracing paragraphs of this guarantee. A request will bring a specimen copy, together with any desired special information as well as a comprehensive catalog that shows in detail how Enterprise Wheels are made, and why we can enter safely into this sweeping guarantee.

We will gladly confer with you to analyze your individual needs.

THE FULTON PIT CAR & MFG. CO.

CANAL FULTON, O.

MINE CAR SPECIALISTS

Manufacturing

Wood, Steel or Composite Mine and Clay Cars, Mine Car Irons, Trucks and Wheels to any Specifications

Main Office and Works, Canal-Fulton, O.

SUBSTANTIAL
PROFITS
ARE
REALIZED
BY
MINE
OWNERS
USING

MODERN
CAR
EQUIPMENT
MADE
IN
OUR
EFFICIENT
FACTORY

Progressive Operators and Miners Recognize the High Standard of Fulton Cars and Wheels.

Materials

Those entering into our products are the best obtainable and give maximum results. They are rigidly inspected, thus insuring constant quality, and are treated and finished in our own factory after the most approved and up-to-date methods. White Oak Lumber used in our cars is carefully selected and inspected. The Chemical and Physical Tests of our Wheel Mixtures are carefully supervised. No scrap-iron is used and we guarantee a superior wheel of great strength and deep chill.

Workmanship

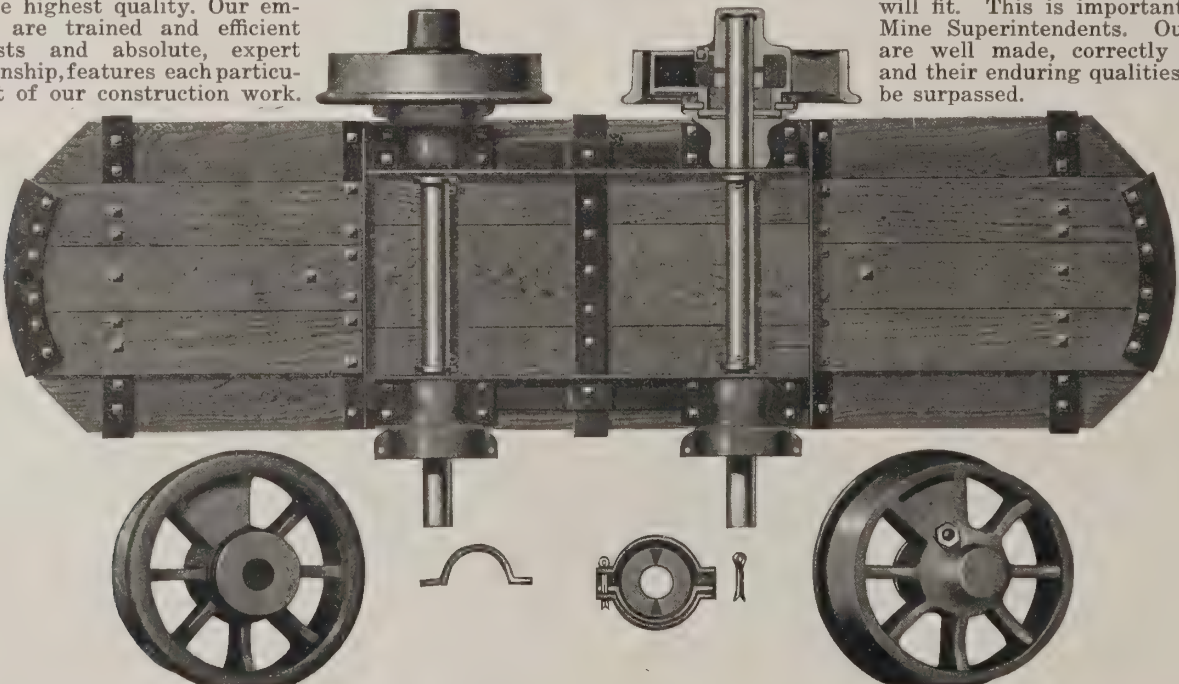
is of the highest quality. Our employees are trained and efficient specialists and absolute, expert workmanship, features each particular part of our construction work.

Cars

We construct cars to suit any required specifications or local conditions. Our Engineers are at your service gratis. We check and call attention to all weak points in any specifications coming to our offices. Approved specifications are strictly adhered to. Each completed car is examined for flaws or variations before shipment. We guarantee our Cars to stand the most exacting tests.

Car-Irons

Fulton Car-Irons may be duplicated at any time. All repair parts can be replaced, and they will fit. This is important to the Mine Superintendents. Our Irons are well made, correctly shaped, and their enduring qualities, cannot be surpassed.



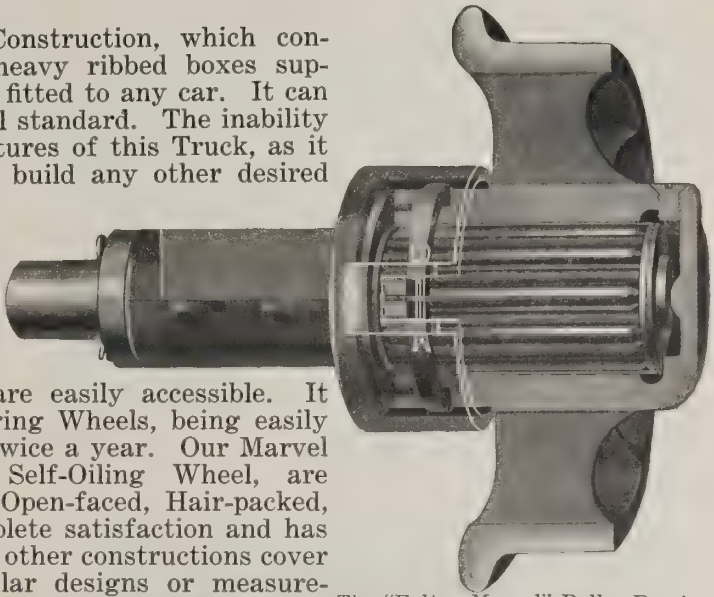
The effectual service given by our Angle Bar Truck construction is testified to by well satisfied customers.

Trucks

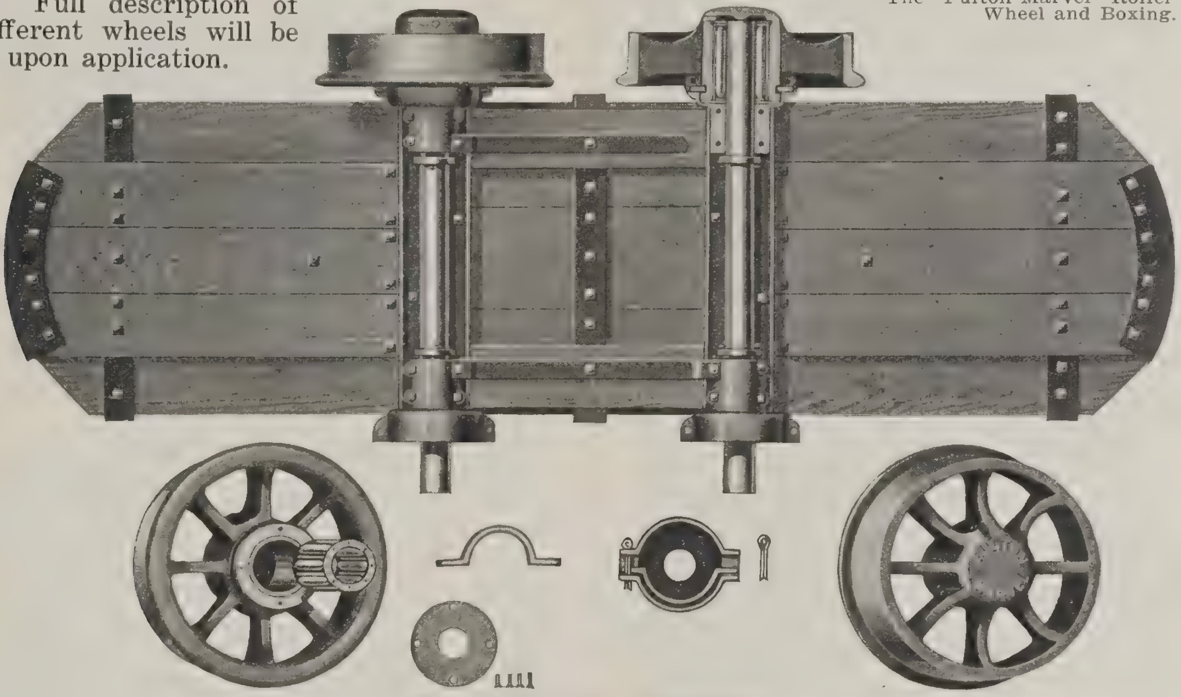
We call attention to our Angle Bar Truck Construction, which consists of two side angles, two cross angles and heavy ribbed boxes supporting the axle. This particular Truck can be fitted to any car. It can be made, also, to conform to your present wheel standard. The inability to get out of alignment is one of the strong features of this Truck, as it makes the car durable, and easy running. We build any other desired style of Trucks.

Wheels

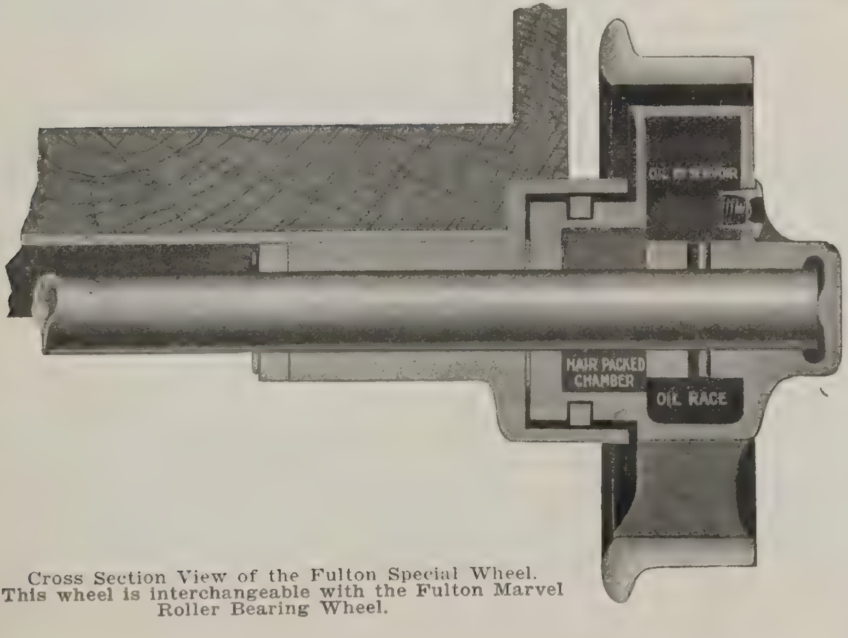
Our Improved Roller Bearing Wheel, is the most valuable proposition we offer. It is recognized as the best qualified wheel of its kind on the market, and is the result of long years of experiment and study along the line of anti-friction bearings. The design is simple, and all parts are easily accessible. It excells in every detail, other so-called Roller Bearing Wheels, being easily removed and requiring lubrication but once or twice a year. Our Marvel Roller Bearing Wheel and Special Hair-Packed Self-Oiling Wheel, are interchangeable. We manufacture the Fulton Open-faced, Hair-packed, Cage Valve Oiling Wheel, which has given complete satisfaction and has proven itself to be one of our best sellers. Our other constructions cover any style of wheel to conform with any particular designs or measurements. Full description of our different wheels will be mailed upon application.



The "Fulton Marvel" Roller Bearing Wheel and Boxing.



Channel Bar Truck Construction.



Cross Section View of the Fulton Special Wheel. This wheel is interchangeable with the Fulton Marvel Roller Bearing Wheel.

Location and Facilities

Our Shops are located at Canal Fulton, Ohio, on the B. & O. and Penna. Railroads, 56 miles southwest of Cleveland, Ohio. The Capacity and Output of the Plant has been materially increased withing the past year. The machinery and equipment throughout is the most modern and efficient obtainable. The employees are men of unusual ability who aim at the highest notch of efficiency.

Catalog

Descriptive literature and Catalog explaining all our new features and products will be sent to you upon request.

Organization, efficiency and modern equipment, is the key to our low prices and unquestioned quality.

THE HOCKENSMITH WHEEL & MINE CAR CO.

(Established 1875)

PENN STATION, PA.
PITTSBURGH DISTRICT

Huntington Supply & Equipment Co.
Huntington, West Va.

Webster & Co.
Knoxville, Tenn.

Products

Mine Car Wheels, any style; Self-Oiling or Roller Bearing; Angle Bar Truck, (the Truck that is designed for hard service); Mine Cars; Steel, Wood or Composite; Sheaves, Rope or Bell; Cast Iron Pipe; Frogs; Turnouts; Mine Car Hitchings; Motor Wheels, Steel Tires re-turned.

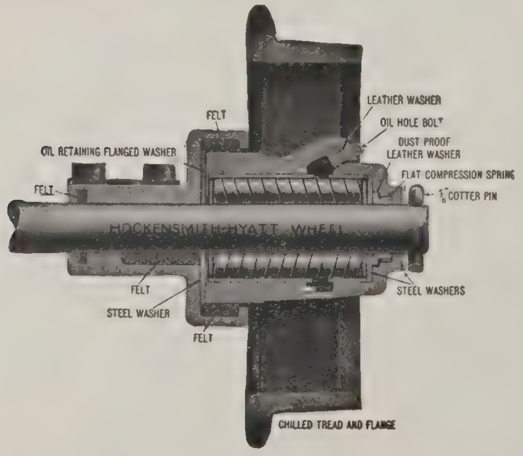
Wheels

The "DEPENDABLE MINE CAR WHEEL" is designed and made to meet the severe conditions imposed by long hauls, increasing loads and motor haulage. This type of wheel can only be obtained:

First—By the use of high grade iron in order to secure strength and proper depth of chill. Since the chill is affected by the chemical properties of the iron, it is imperative that the composition of the iron be accurately known. Our iron mixtures are carefully made daily, so that the casting will not be weak due to the use of iron of incorrect analysis. Another operation is just as essential and that is

Annealing

We have special arrangements in our factory for the proper annealing of our Mine Car Wheels. All our mine car wheels are subjected to this process, which results in a wheel having strong hubs and spokes without in any way softening or affecting the chill.



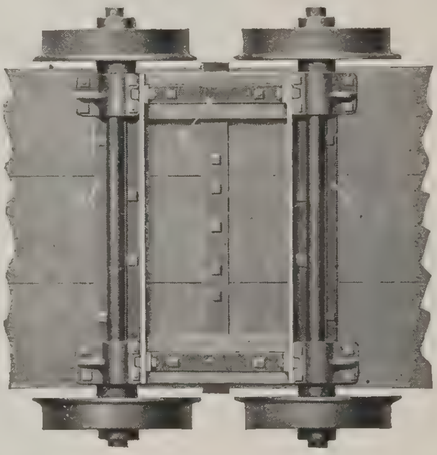
Aside from considerations of strength and wearing qualities there are others such as economy in the consumption of lubricant. To those interested in this phase of the question, we call attention to our

"Eureka" Wheel

The merits of this wheel may be briefly described as

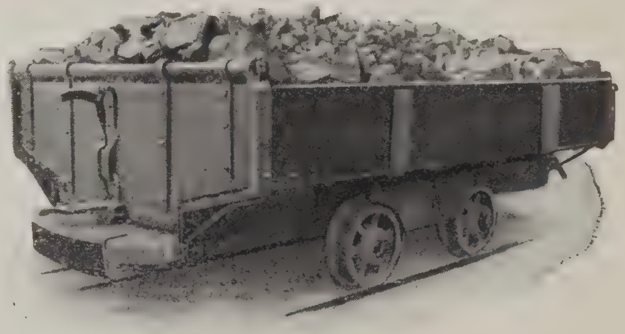
First—Exposed Linch Pin type. This type of wheel permits easy removal and replacement. Accidents due to lost or defective linch pins are minimized, owing to the facility with which these defects can be discovered.

Second—Large oil reservoir in the hub. This hub has a sufficient capacity to insure lubrication of the wheel without re-oiling in from two to four weeks depending on the service.



Third—Simplicity of valve construction. This valve is held in position in a pocket cast on the outside of the shell of the oil chamber, so that it cannot get out of order and thus affect its operation.

Fourth—Dust, dirt and water are effectually excluded from the oil chamber due to the accurate seating of the valve in the oil hole. This dirt and sand feature is very important, especially where motor haulage is used, as it is well known this sand frequently accumulates on the internal spring oiling valves known as "Push Button" type and is washed into the oil chamber with the lubricant when the wheel is being oiled. When this hard sand once enters the oil chamber it works its way down on the axle and materially assists in cutting out the hub.



We have now scattered throughout the mining districts of the United States, over one-half million of these wheels in daily use, and as we are casting them at the rate of six hundred per day, they must possess the merits which we claim for them. The first design to stand the test of time and reach the million mark in production.

We wish to call your attention to the fact, however, that we manufacture other than the **"Eureka"** type of wheel. We can furnish wheels similar to any design now on the market and to fit your present axles. Our Push Button wheel is an improvement over the other types of wheels of this kind now on the market in that we have provided a machine seat for the valve, as well as a long spring, which arrangement insures the accurate seating of the valve. We can also furnish wheels having bolted on caps or with cast on solid ends. Also a semi-enclosed end type having an oil hole at the center—can be oiled while in motion. Also

The Hockensmith-Hyatt Roller Bearing Wheels

In designing this wheel we have endeavored to keep in mind the many advantages of an exposed linch pin type of wheel. Capped wheels are furnished when desired. The oil storage features usually obtained by having the end solid are secured by a leather washer held close to the axle by means of a flat compression spring. As this wheel incorporates the Hyatt Flexible Nickel Chrome Steel Roller, we are not under the necessity of increasing our hub diameter for oil storage purposes, since this is taken care of by the rollers being hollow. This type of wheel requires lubrication but from two to four times per year, depending upon the service.

We point with pride to the fact that although this wheel has been on the market for six years and is now in use under the most severe conditions we have never been called upon to change the design. We maintain standards.

Angle Bar Trucks

This is the Truck that is strong where others are weak. There is placed across the car bottom two 6″ x 3½″ x ⅜″ angles, each of which are equivalent in strength to a 3″ square axle, but since the 6″ leg is placed next to the car bottom gives twice the bearing suface. This support to the bottom insures a full floating axle which in this construction is made of Cold Rolled Shafting, full section throughout and can be removed in case of accident without taking off boxes or turning car over. Two bolts in addition to a small projection pass through the angle while two larger projections are forced into the wooden bottom. The insertion this construction we are enabled to use wheels vent their coming together due to sudden stoppages, etc., with the strap which ties the angles, preventing their spreading due to action of brakes, etc., isures an absolute rigidity to the boxes which in turn results in a permanent wheel base. With thic construction we are enabled to use wheels having a hub length of 7″—the center line of the hub being coincident with the center line of the load, so that we are enabled to obtain a balanced bearing. This Truck eliminates repairs, "wobbly cars" and cut-out wheels. Can be used upon any type of car and adapted to any style of wheel. When minimum height of car is desired we use and recommend our Double Angle Trucks, which arrangement places angles close to bottom of car.

The style of mine cars is determined entirely by local conditions. We can construct cars either from your design or upon receipt of sufficient information will be glad to submit ours. The Composite Steel Car which we show in the illustration is one of eight hundred built for one company. The side of this car is composed of ¼″ steel flanged plate, bolted to the car binder, which construction follows that usually employed in the construction of wooden cars. The bottom is of 3″ White Oak. The Latch is our "Correll" design which can be automatically opened and is self-closing. This car incorporates our Angle Bar Truck Construction with Hockensmith-Hyatt Roller Bearing Wheels.

We can construct all steel cars either bolted or riveted, or any type of wooden car.

Sheaves

The Sheaves manufactured by us are made from the same high grade strong iron that is used in our mine car wheels. We make the rope sheave either with a plain groove or rope lined groove. Bell sheaves are made either with or without stands and have chilled wearing faces.

We were awarded the Gold Medal—highest award—at the Panama Pacific Exposition, on our Wheels, Oiling System and Cars. All that goes to make up a Dependable Car.

Catalogues

Our latest Catalogue illustrates and describes our products more in detail and we would be glad to send this to you upon request.

KENOVA MINE CAR COMPANY

KENOVA, W. VA.

Manufacturers of

Wood and Steel Mine Cars

Products

Mine Cars, Wood, Steel and Composite. All styles of Wheels, plain-bearing, self-oiling and roller-bearing. Car Irons, Motor Wheels.

Materials

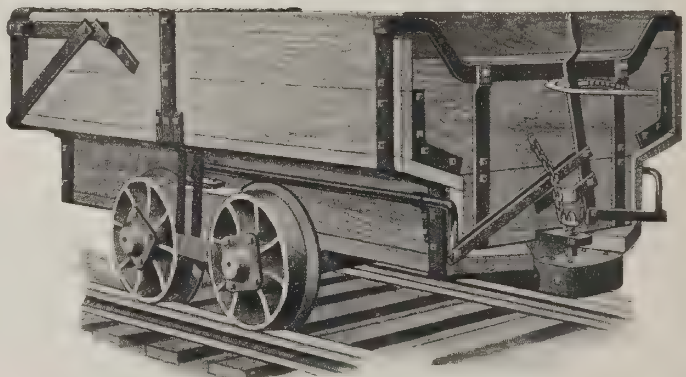
Wheels are made only from high-grade irons and cooled in special designed cooling pits giving a deep chill. This is of vital importance in this day of high-speed haulage in mining where transportation is one of the principal costs of coal production.

Workmanship

Cars are produced under the direct supervision of skilled inspectors, a bonus being paid for quality, and not for quantity, assuring finished product of uniform high grade. Our heating furnaces are of unique construction, employing natural gas, which insures uniform heat, which is the fault of coke or coal furnaces, the process which is used by all other mine car manufacturers.

Materials (additional)

Located as we are in the heart of the lumber belt of West Virginia and Kentucky, we are enabled to secure car lumber at a minimum cost under direct supervision of our own inspectors. We select only the highest grades of white oak car stock.

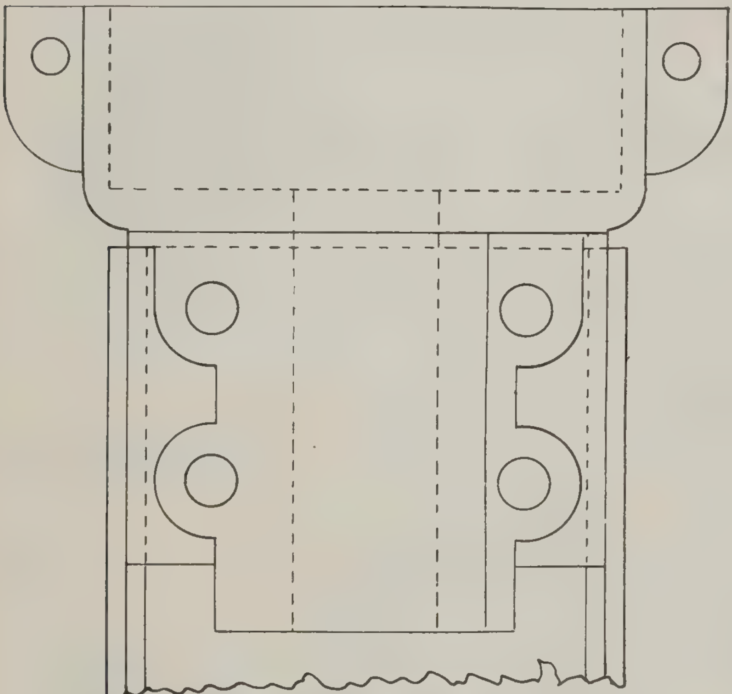


One of Our Several Types of Cars.

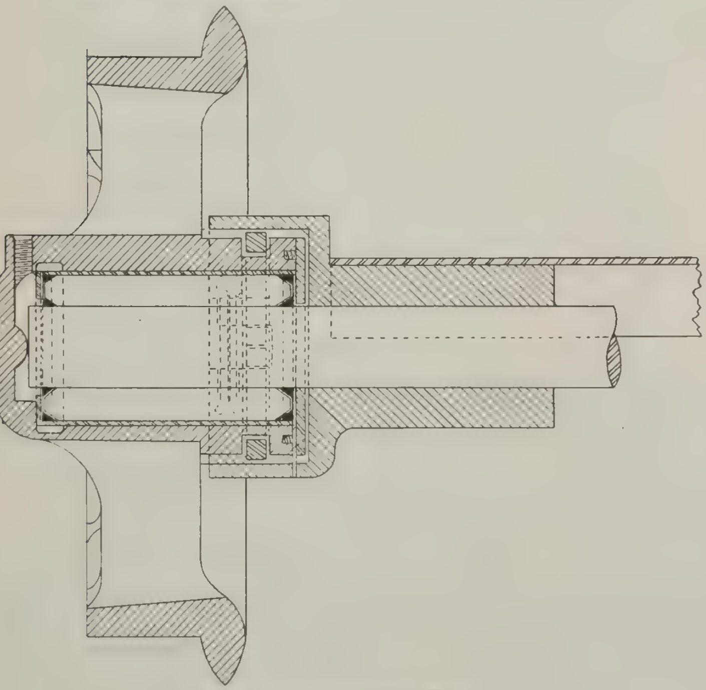
Kenova Mine Car Co., located on B. & O. R. R., C. & O. R. R., N. & W., C., C. & O., Virginia R. R. and on the Ohio River. We announce the completion of our new plant, covering 12 acres of ground and buildings aggregating floor space of 3⅝ acres, for the manufacture of mine cars—the most modern plant of its kind in America. All machines individual motor-driven. Equipped to produce 60 complete mine cars daily. Capacity of No. 1 cupola, 300 car wheels per day.

Trucks

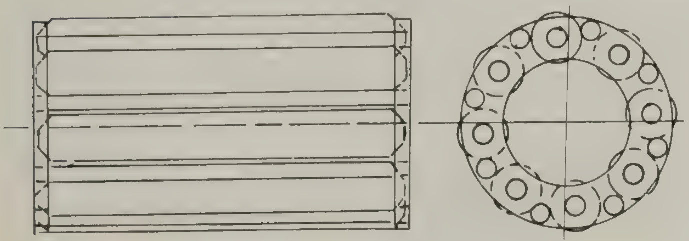
Our special angle bar construction employing two side angles, cross-braced with heavy reinforced boxing, insures continued perfect alignment. Any other style truck can be furnished.



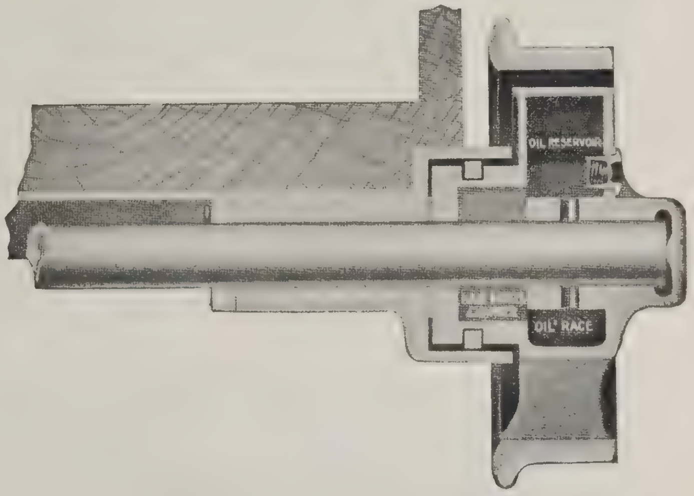
Sketch Showing Channel Bar Truck Box Construction.



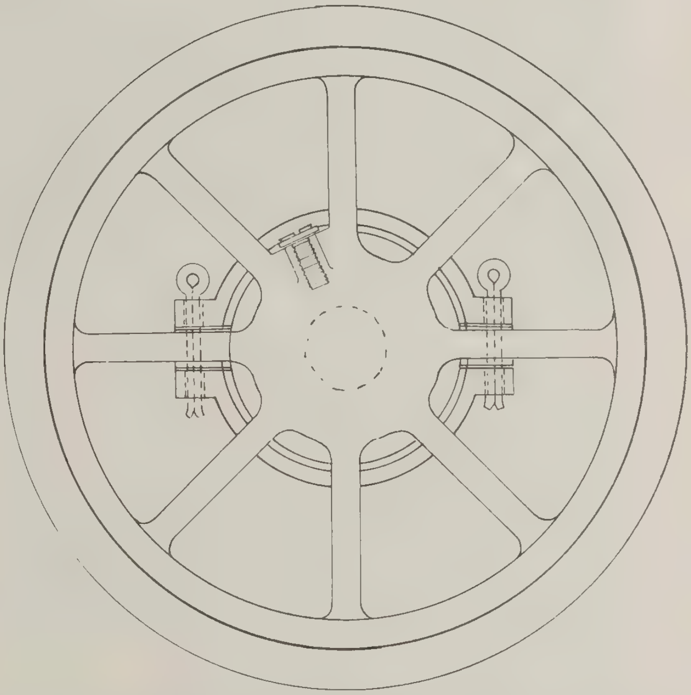
Sectional Drawing of Wheel.



Showing Roller Bearing Construction.



Cross Section of the Kenova Wheel.



Outline Drawing of Our Wheel.

Location

Our plant is located at the confluence of the Ohio and Big Sandy Rivers, at a point where the states of Ohio, West Virginia and Kentucky converge. This, combined with our railroad facilities, gives us an economic advantage which means a saving for you, as well as for us. We have direct switching facilities into our plant from the following railroads:

- Chesapeake & Ohio R. R.
- Baltimore & Ohio R. R.
- Norfolk & Western R. R.
- Carolina, Clinchfield & Ohio R. R.
- Virginian R. R.
- And Ohio River for barge shipments.

We are prepared to bid upon your specifications, or submit original drawings for your approval.

LOBDELL CAR WHEEL COMPANY

ESTABLISHED 1836

WILMINGTON, DEL.

Steel and Iron Founders and Machinists

Eighty years of successful manufacturing of car wheels is the history of the Lobdell Car Wheel Company.

The beginning of the Lobdell Car Wheel Company was practically coincident with coal mining in America. And the company has grown and developed with the coal mining industry.

Mere magnitude means nothing, but the magnitude of this Company, one of the largest engaged in the car wheel business, has been due entirely to the superiority of its products.

Nor does mere age mean anything. The age in the case of this Company means experience, knowledge, progress. Every product of the Lobdell Car Wheel Company represents the highest achievement in its particular line—the highest achievement in design, the practical limit in quality of materials and accuracy of workmanship.

There are as many grades of chilled cast iron as there are of any other material. And the factors which produce the high grades are experience and knowledge and well-defined standards.

Needless to say, the plant must be modern in every detail. In all of these respects the Lobdell plant is unique. And in it are employed apparatus for the production of fine chilled iron which have been specially constructed to meet the Lobdell demand for the production of material of extraordinary strength and hardness.

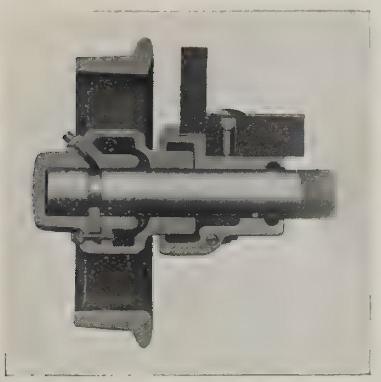
There are no cheaper wheels than Lobdell Wheels. There are some that can be bought at lower prices, but this Company has never allowed itself to be tempted to meet low-price competition by any reduction of quality.

The Lobdell Company is fully equipped to make wheels of any description, furnishing either the wheels, axles, pedestals complete, or the wheels only suitable for use with axles already installed.

A very interesting and valuable catalog descriptive of the various types of wheels made in the Lobdell plant is to be had for the asking. The enormous variety of patterns and the diversity of types preclude the publishing of all this information in a condensed catalog of this kind.

Long experience, however, permits the recommendation of the following types as being the most efficient in their respective classes:

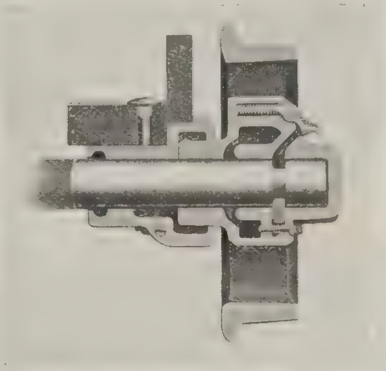
The "Faught" Closed-Hub Self-Oiling Wheel



The "Faught" Closed-Hub Self-Oiling Wheel.

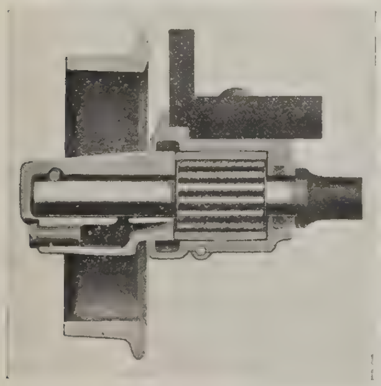
This is the most satisfactory wheel of this type made. It is easily and securely fastened on the axle. It has a solid closed hub—no expensive gaskets or leaky wheels. The lubrication is the best to be obtained in this type of wheel—the generous oil cavity holds enough oil to last several months. The extra long wheel bearing (8″ evenly balanced) insures against worn hubs and wobbly wheels. The quality of the workmanship and material is the usual Lobdell standard.

The "Faught" wheel is used extensively in many coal and metal mines in Cuba, Central America and all parts of the United States.



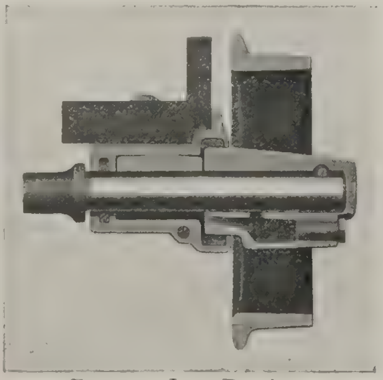
Spring Trigger Wheel.

The "Lobdell" Tight and Loose Wheel Hyatt Roller Bearing Equipment



Roller Bearing.

This is the most scientific use of the roller bearing in mine car equipment. The roller bearings are mounted in self-aligning steel sleeves in the pedestal casting by which method they are absolutely relieved of any uneven wear due to thrusts from the rail against the flange. The demands for high speeds and heavy loads incident to modern, up-to-date mining operation are met in this equipment which can be furnished with iron or brass bearings instead of the steel sleeve and rollers if preferred. It is particularly recommended for use under heavy cars requiring axles 2¾″ in diameter and over.



Brass or Iron Bearing.

MINING LOCOMOTIVE WHEELS

Lobdell Chilled Iron Wheels

Meet the severe requirements of this service perfectly. The great superiority of the Lobdell casting and annealing processes enables the production of wheels whose great economy lies in their extraordinary length of good service.

Steel Tired Wheels

The Lobdell standard is maintained in the production of these wheels. The materials are the best obtainable for the purpose, and the tires and centres are both machined accurately to standard gauges. Loose tires will be furnished properly bored for refitting on to the old centres.

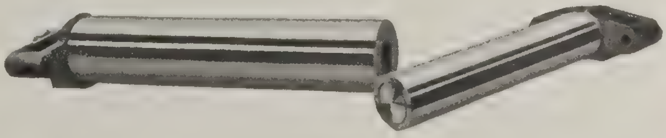
Lobdell High Carbon Heat Treated Solid Steel Wheels

Offer considerable economy in first cost over the steel tired wheels, having the same advantages of increased tractive power, flange strength, etc.

Lobdell Wheels in any of the above types are furnished for almost any make of mining locomotive (Jeffrey, General Electric, Goodman, Baldwin-Westinghouse, Morgan-Gardner, etc.). This Company is thoroughly equipped with patterns and makes a specialty of refitting such wheels on either old or new axles.

CHILLED IRON PUMP PLUNGERS

Chilled iron pump plungers have a hard chilled surface, accurately ground and highly polished, which will positively not score. The packing on pumps equipped with Lobdell Chilled Iron Plungers has been known to last for several years and the saving in packing usually very soon pays for the cost of the plungers. These plungers can be furnished for any style pump now using grey iron or copper-jacketed plungers.



Chilled Iron Plungers.

IRWIN FOUNDRY & MINE CAR CO.

Factory and Office, IRWIN, PA.

Manufacturers of Mine Cars and Wheels

Products

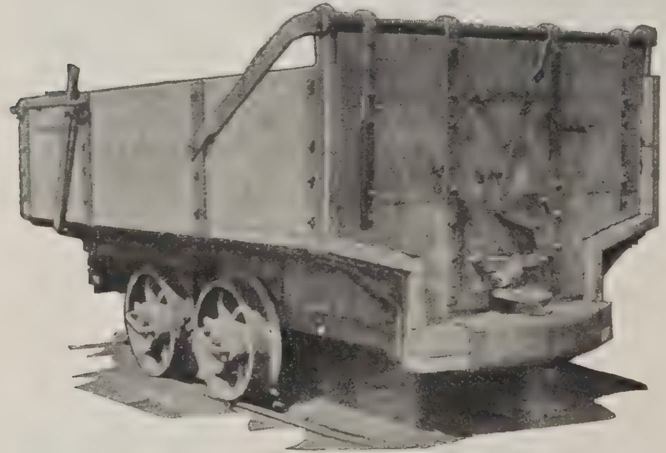
MINE CARS—Any Type.

WHEELS—For Mine Cars and Industrials Trucks, Roller-Bearing or Plain Self-Oiling.

CASTINGS—High-Grade Grey Iron Castings of all kinds.

Mine Cars

We build all types of Mine Cars. The car illustrated below is one of 2,500 that we have built for one firm during the past two years, and is equipped with many of our best features, viz.: the Steel Center Bumper; the Auxiliary Drawbar; the Channel-Bar Truck; Dust-Proof Bearings; Cold Rolled Steel Axles; the "Yoke-Oiler" Wheel. These are all features that have been developed to meet the present-day demand for a car that will stand hard usage with light maintenance cost.



High Vein Wood Car.

Our Engineering Department will gladly consult with you and design a car to suit your conditions. If you build your own cars, we can furnish the irons all ready punched and bent at prices that will attract you. For the irons we use only the best grade of open hearth steel.

Low Vein Steel Side Car.

Grey Iron Castings

We make a specialty of all kinds of close-grained Iron Castings, especially for mine use; such as—Frogs, Piston Heads and Rings, Bushings, Liners, Bearings, Grate Bars, Boiler Door Liners, Coke Oven Frames, Pipe Specials, Etc.

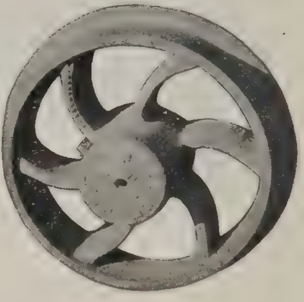
LET US BID ON YOUR CASTING AND PATTERN WORK.

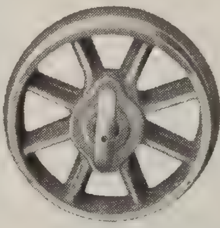
Wheels

We have made many kinds of wheels, but our experience has shown us that the wheels illustrated above will suit the conditions at any mine. All our Wheels are made of the best grade of pig iron, are well chilled, and carefully machined.

"The Solid Hub"

The advantages of this wheel are obvious. The oil hole is on center, and, therefore, is easily accessible. The wheel can be half-full of oil at all times, making frequent oiling unnecessary.



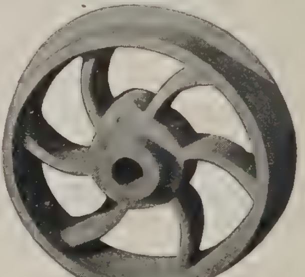


"The 'Yoke' Wheel"

Our "Yoke" Wheel was developed from the Solid Hub Wheel, and has all its good features. The oil hole is centrally located; the wheel is, therefore, easily oiled; the oil chamber is large, the wheel will, therefore, run a long time on one oiling; the linch pin is accessible and the wheel is, therefore, easy to put on and take off.

"The Spring-Oiler"

This is the wheel that you should use when there are some special conditions that require that no part of the wheel or car shall protrude beyond the end of the axle. This wheel has a large oil chamber and can run through grit or water without injury to the wheel.



Other Wheels

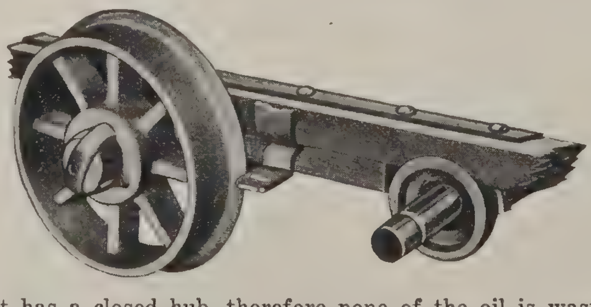
If you have a Wheel of any special design, or have any preference for some standard design, other than those described above, we would be pleased to quote you prices.

The Sensenich Truck

The very newest departure in mine car equipment. The features of the wheel that will especially appeal to the operating man are as follows:

It is always in gauge, therefore runs easily without washering out or in.

It is a center oiler, therefore easily oiled.



It has a closed hub, therefore none of the oil is wasted, all of it lubricates either the wheel or the bearing.

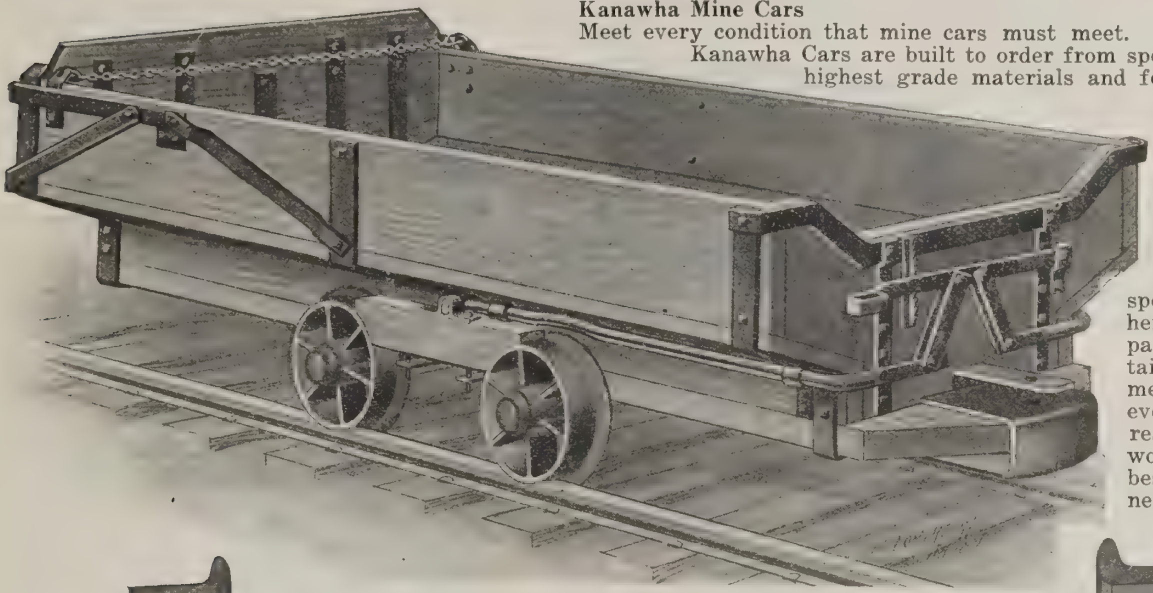
It can be easily put on or removed.

The truck is equipped with Cold Rolled Steel Axles, and dustproof boxes, with channels for heavy, big vein cars; without channels for light, low vein cars.

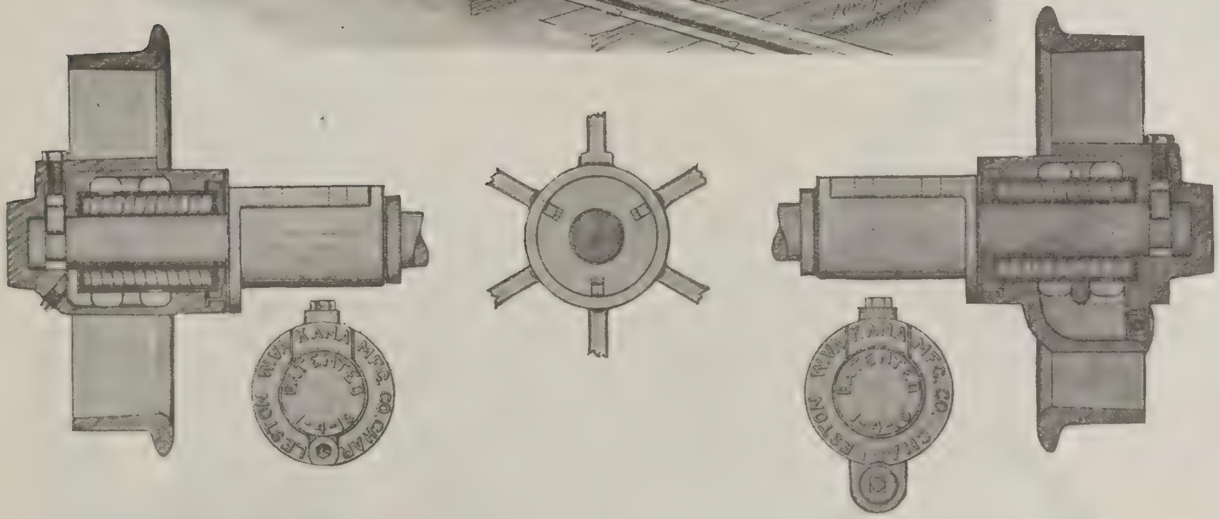
We would be pleased to furnish you a truck for six months' trial.

KANAWHA MANUFACTURING CO.

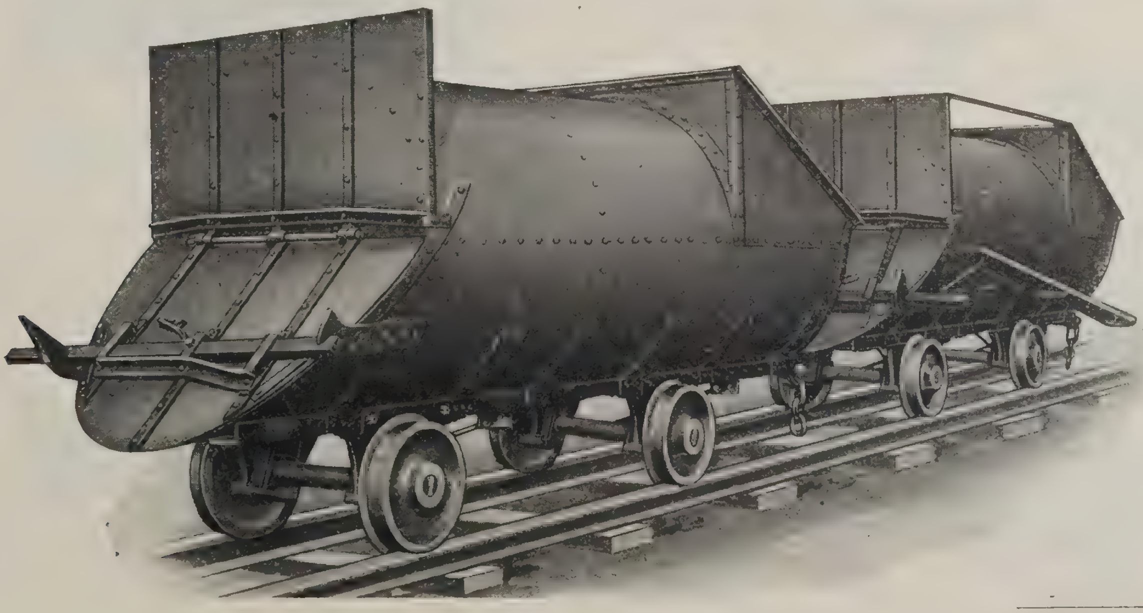
CHARLESTON, W. VA



Kanawha Mine Cars
Meet every condition that mine cars must meet. THE REASON—Kanawha Cars are built to order from specifications, of the highest grade materials and for the best interests of the user. As a result, a vast number of operators are now buying Kanawha Cars exclusively. Every operator recognizes the need of special adaptions in height, width, capacity and other details. Efficient roadmen, practical in every sense, are ready to help you work out the design best suited to your needs.



Kanawha-Hyatt Roller Bearing Wheels
give the maximum of efficiency in durability, ease of running and in economy in oil and repairs. These wheels soon pay for themselves in oil saved. Each wheel holds a full quart of oil, enough in all cases for eight to twelve months running.



The Orenstein—Arthur Koppel Company

Plant, Koppel, Pa.

Sales Offices:
NEW YORK CHICAGO PITTSBURGH SAN FRANCISCO

KOPPEL

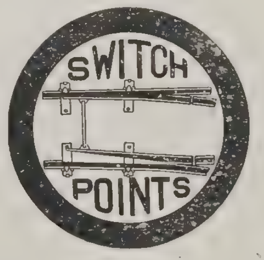
Mine Car and Track Equipment

Products

Cars and track adapted to every condition.

45 years of Engineering and Manufacturing Experience in Industrial Transportation. Prompt shipments from stock.

Special Equipment Designed and Built. Ask our Engineers. Catalog on request.



Switch Points

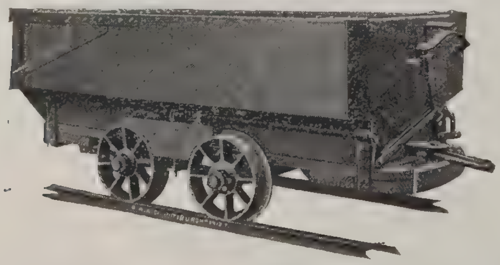
4′ to 15′ length. 12 lb. to 80 lb. rails. Special sizes to order.

Frogs

4′ to 15′ length. 12 lb. to 80 lb. rails. Special sizes to order.

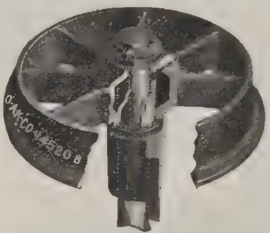
Composite Car

Cost 60% less for maintenance than old style cars. 15% greater capacity than wood car of equal size. Any running gear desired.



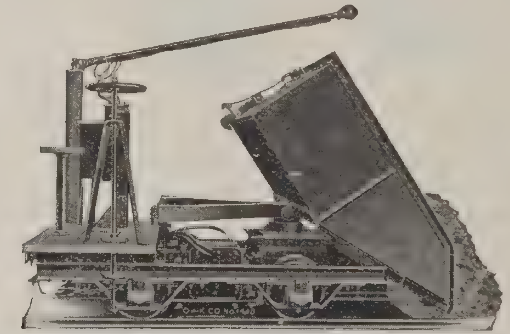
Cast Steel Wheels

Cast Steel Wheels of self-oiling type, with replaceable C. I. bushings, or with roller bearings in hub. Light weight with strength and running qualities.



Scoop Type All Around Dump Car

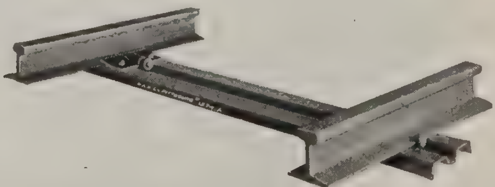
For quick disposal of waste material. Operated by one man. No tipple necessary on dump. Dump can be built up on sides or end as desired.



From 36″ to standard gauge. A. C. or D. C. Motor. Capacity 54 Cu. Ft.

Ideal Steel Tie

Saves 4″ headroom. Rail cannot slip. Rails held by brackets and clutch bolts. Tie not weakened by large holes.



Phillips Mine & Mill Supply Co.

ESTABLISHED 1863.

Pittsburgh, Pa.

Mine and Coke Works Equipment

Agencies:

SEATTLE: A. F. Blair, C. & M. E.
SALT LAKE: Utah Eng. & Machy. Co.
LETHBRIDGE, CAN.: J. B. Turney & Co.
HUNTINGTON, W. VA.: Miller Supply Co.

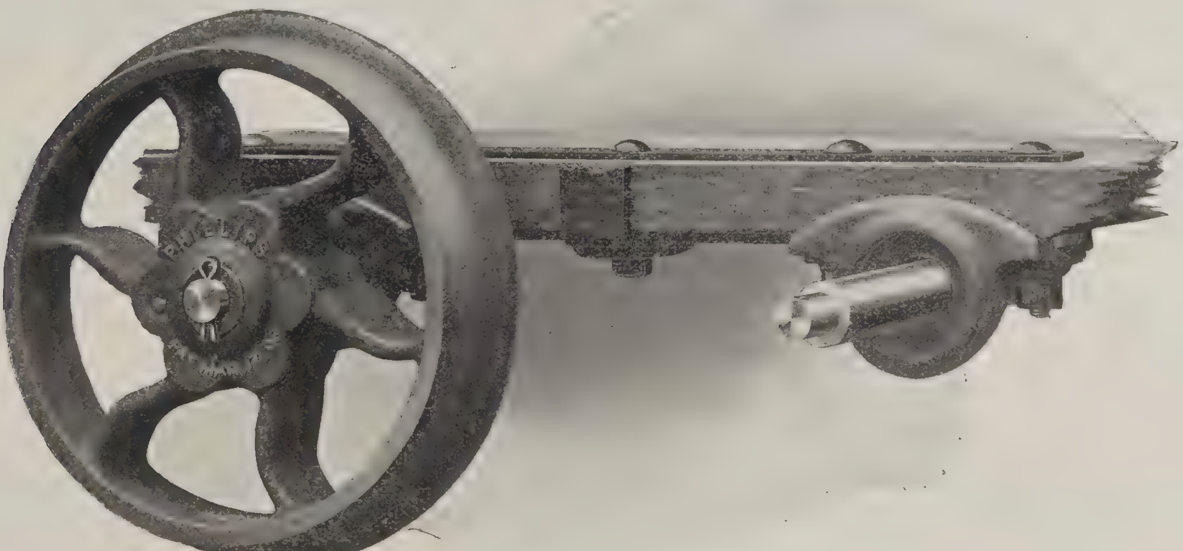
Products

Mine Cars, Mine Car Wheels and Trucks, Screens and Screening Equipments, Larry Wagons, Incline Drums, Car Hitchings, Frogs and Turnouts, Automatic Car Stops and Caging Machines, and the Phillips Automatic Cross-Over and Automatic Push-Back Car Dumps.

This Company was one of the first to engage in the manufacture of Mine Cars and Mine Car Wheels and Trucks, and our product has always kept pace with changing conditions in the mining industry. Some years ago, we conceived along entirely new and original lines the **Phillips Patent Open Cap Wheel Truck,** in which is combined the best features of the open end and the capped wheel. This Truck embodies a complete reversal of the usual practice in that the axle collar is **inside** the wheel where it runs continuously in oil. This collar maintains the wheels to guage and prevents sideways play of the axle, answering the same purpose as the projecting collar on the ordinary axle, and if a linch pin should be lost the axle cannot work through. The linch pin is always visible. Our system of connecting the felt-packed journal boxes with heavy steel straps, both over and under the car bottom, prevents the boxes from shifting on the bottom of the car, and the axles are always held in true alignment. When lubricated with grease, the wheels will run four to six months and even longer with one lubrication.

Due to placing the collar of the axle inside the wheel where it runs continuously in oil friction has been materially reduced, and the drawbar pull on cars equipped with these **Open Cap** Trucks is fully 25% less than on cars equipped with self-oiling wheels of the regulation type.

Internal wear has been practically eliminated, and while the Truck is guaranteed for only one year in this respect we would run no risk in offering a guarantee of 5 years or more, as even the first few experimental trucks of this type which we put out 8 years ago show no perceptible wear internally. Our wheels contain no scrap, being made of the very best of new metals mixed with charcoal iron and annealed in pits, so seldom break. We receive orders for very few repair parts, and operating costs for this Truck are suprisingly low.



It has been adopted exclusively at many of the largest operations in the country, and 2 concerns are each using well over 10,000 Trucks. Dozens of concerns have found it profitable to discard their old running gear in order to equip their cars exclusively with these Trucks on account of the economies they will effect.

In order to quote on or furnish these Trucks we should have a drawing of the car to which they are to be applied. They can be furnished in all the usual and desirable combinations, and we will be glad to furnish full particulars, drawings and prices on request.

PRESSED STEEL CAR COMPANY

Builders of

MINE AND RAILROAD CARS

General Offices

Farmers Bank Building
Pittsburgh, Pa.

Works

Pittsburgh, Pa., McKees Rocks, Pa.,
and Hegewisch, Ill.

Sales Offices

NEW YORK PITTSBURGH CHICAGO WASHINGTON, D. C.

Mine Cars

Steel Mine Cars

are becoming more popular every year with mine owners on account of their strength as compared with wooden cars, the greater capacity obtained within limiting dimensions and their lasting qualities.

A Less Number of Cars

are required to operate a mine of a given output, as fewer cars are out of service on account of repairs.

The Economical Operation

of mines is a point of vital importance to mine owners, and in spite of the fact that the first cost is somewhat greater the steel car is much less expensive in the long run.

The Pressed Steel Car Company's

experience in this line is of long standing, and the many thousands of mine cars turned out by them are, without exception, giving entire satisfaction.

Special Attention

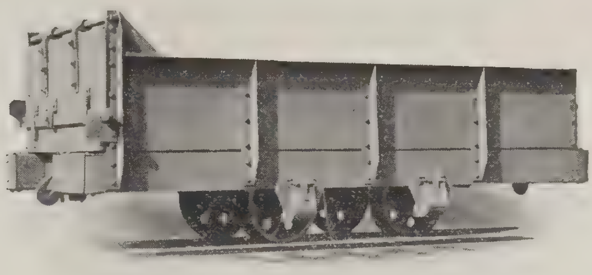
is called to the fact that this Company is in position to build Steel Mine Cars of any design or construction which may be desired. We are always glad to send our representative to go into the question of designs, or these can be prepared from blue prints showing the cars at present in operation, or upon receipt of detailed descriptions of the cars desired, including limiting dimensions, etc.

Attention is invited to the illustrations below and on the opposite page, which show a few of the various cars built by this Company recently.

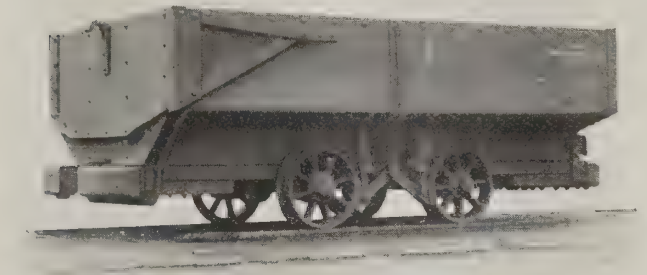
Steel Mine Car with wooden floor and spring drawbars, side sheets being composed of two plates either riveted or bolted together.

Steel Mine Car with 4″ Oak floor bolted to side and end sheets, equipped with ½″ pressed steel double bumpers and side operated brake applied to all wheels.

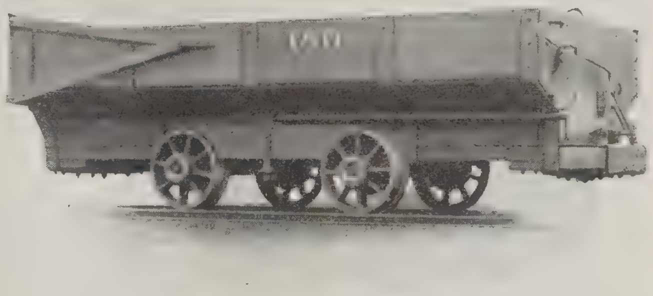
All Steel Mine Car with steel floor and removable wooden bumper cushions. This construction permits a very low car with large capacity.



All Steel Mine Car constructed of steel plates and rolled shapes arranged so that any damaged parts can be easily replaced at the mines. Equipped with waste packed journal boxes.



A Steel Car of the double or side bumper type, with wood floor. Equipped with an all-metal brake arrangement and self-oiling wheels. Wood Block Brake Shoes can be substituted for the all-metal brake shoes if desired.

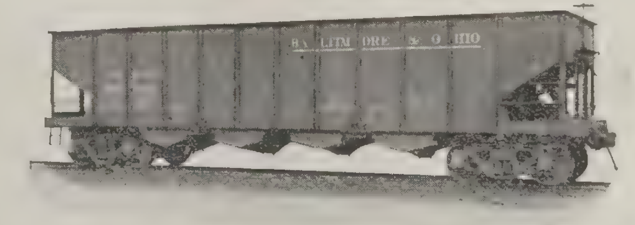


Steel Mine Car with wooden floor of the pieced or bolted type, each side sheet being composed of three 1/4″ steel plates bolted together in order to facilitate repairs.

Freight Cars

In addition to the manufacture of mine cars, The Pressed Steel Car Co. is one of the largest builders of freight and passenger cars in the world, being the first Company to engage in the manufacture of steel cars, and the long experience in this line of work, together with the experienced force of engineers and the large capacity of its plants, enables it to take care of the largest as well as the smallest consumer of either mine or railroad cars.

Self-Clearing Hopper Car.
Standard Type of Center Dumping Coal Car.
Capacity, 110,000 Pounds.



Quadruple Hopper Coke Car.
Combined Door Opening, 94 Sq. Feet.
Capacity, 110,000 Pounds.
Cubic Contents, 2,792 Cubic Feet.

Write for Special Circulars.

SANFORD-DAY IRON WORKS

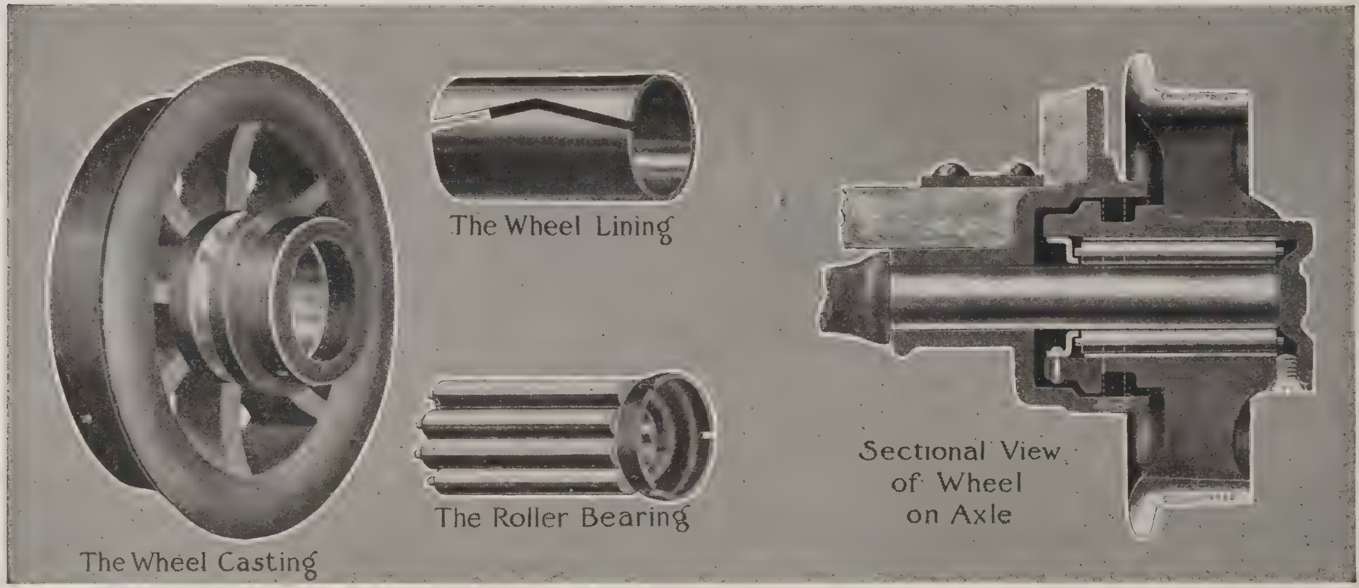
Main Office and Factory: Knoxville, Tenn.

Branch Offices: Birmingham, Charleston, W. Va., Evansville, New York, Denver,

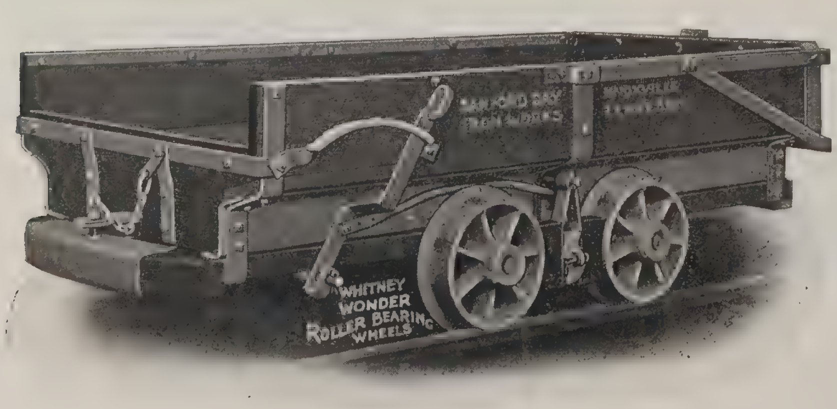
---

Get It

Catalog No. 25-K, the finest mine equipment catalog published—160 pages, loose leaf, cloth bound, 5 sections—Cars, Wheels, Trucks, Couplings, Sheaves, Rollers, Dumps, Drums, etc., etc.



The **"Whitney Wonder"** is the pioneer roller bearing mine wheel of the United States. It has been patented, improved, perfected and tested in over 1000 mines and in every conceivable kind of service. The **"Whitney Wonder"** roller bearing wheel is used in probably more mines than all other makes of roller bearing wheels put together. It is fool-proof, simple and enduring and is the easiest running of all wheels. It is past all experimental risk. It is the combination of an ingenious mechanical design of the greatest simplicity, with metallic excellence of wheel casting not elsewhere obtained. Not a single worn-out roller reported in past 7 years. We invite your investigation.



Mine Cars—All Kinds

Drawings of 2000 different designs. Wood, Steel, Combination, also Pat., Automatic Drop Bottom Cars.

Fig. 22-C-2 shows a new type of mine car. All wood except that the first vertical board is a steel gunwale plate which flanges out over car bottom and flanges in under flare board. This steel gunwale plate prevents the ends from drooping and supports the bottom and flare as well. It has the virtues of the steel car with a cost little more than a wood car.

SOUTHERN WHEEL COMPANY

General Office
Railway Exchange Bldg. ST. LOUIS, MISSOURI

Works
ST. LOUIS BIRMINGHAM ATLANTA SAVANNAH

Manufacturers of

Mine Cars and Wheels

Products

Steel and Wood Mine Cars, all designs; Mine Car Trucks; Logging Cars; Heavy High Grade Castings; Chilled Iron Car Wheels; Mine Locomotive Wheels; Self-Oiling Mine Car Wheels; Roller Bearing wheels.

Experience

Our experience as car wheel manufacturers, together with our large organization and equipment, will warrant your sending us your inquiries.

Fox Mine Truck

In presenting the Fox Truck to the mining industry it has been our desire to produce a running gear that would eliminate the defects in the various makes at present in use and to satisfy an increasing demand for a truck that would overcome the difficulties due to the severe and exacting demands met with in motor and slope haulage, where the loads are heavy and the hauls are long at high speeds. Long ago it became apparent that the wheel depending on lubrication by applying the oil in an annular chamber cored around the wheel hub and passed away for this service. The centrifugal force acting on the oil in the revolving wheel forced the oil away from the bearings, while the WHEEL WAS RUNNING, thereby causing dry bearings which produced undue friction, excessive wear, endless trouble and an extravagant cost of lubrication.

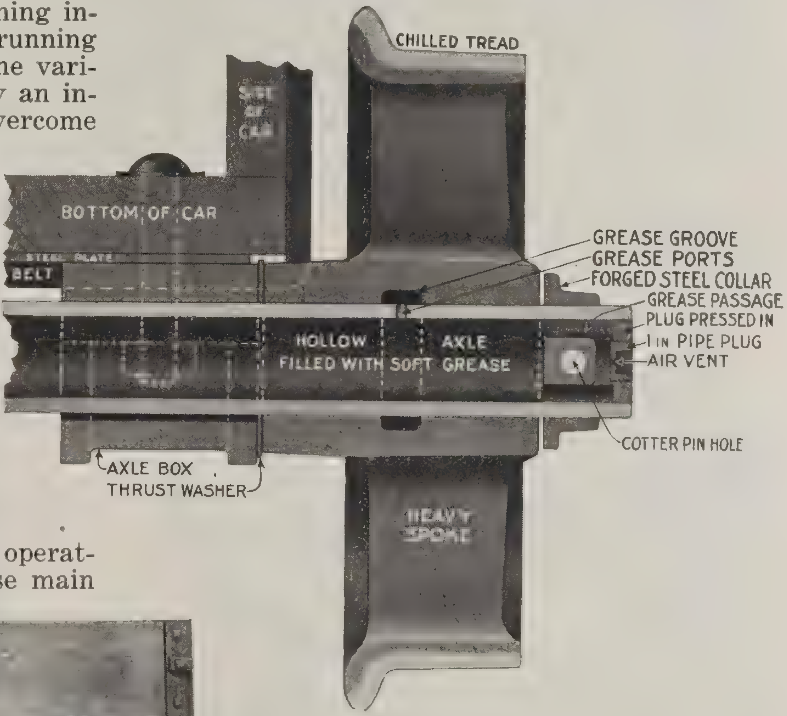
In order to correct these defects, many operators adopted the roller bearing wheel, whose main recommendation was that it would roll easy and was economical to lubricate. It seemed for a while that this type of running gear would meet conditions. On account of its complicated and inaccessable wheel fastening and its multitude of parts, it soon became apparent that it was not the ultimate truck for hard service.

Mine Car Equipped with "Fox" Patented Mine Car Truck.

Therefore, in developing the Fox Truck it has been our aim to produce a running gear that would maintain most of the desirable features of the roller bearing without its complications, to combine the simplicity of the plain oiled wheel and at the same time to produce a new type of truck of great strength and eliminate as much weight as possible.

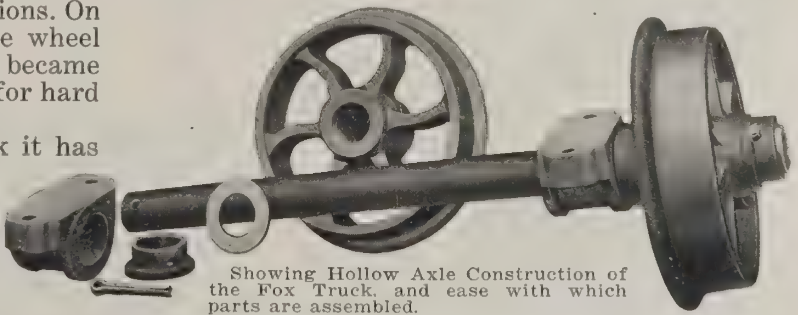
In recommending this truck for severe service, we feel sure that we have been successful in producing the simplest most practical and efficient running gear ever devised for a tram car. The first of these trucks were put in operation on April 15th, 1913. Since that time we have improved and strengthened its construction and have placed several hundred sets in various mines in Alabama.

Those who are using them acknowledge that they meet conditions better than anything they have ever tried.



The Wheel

is the result of twenty-eight years experience in the manufacture of car wheels for all classes of service. The design, workmanship and material are the best that a complete organization backed by ample capital can produce in modern shops, equipped with the latest tools and machinery. It is impossible to make a better wheel.


Showing Hollow Axle Construction of the Fox Truck, and ease with which parts are assembled.

Booklet giving details on request. Our engineering department is at your disposal.

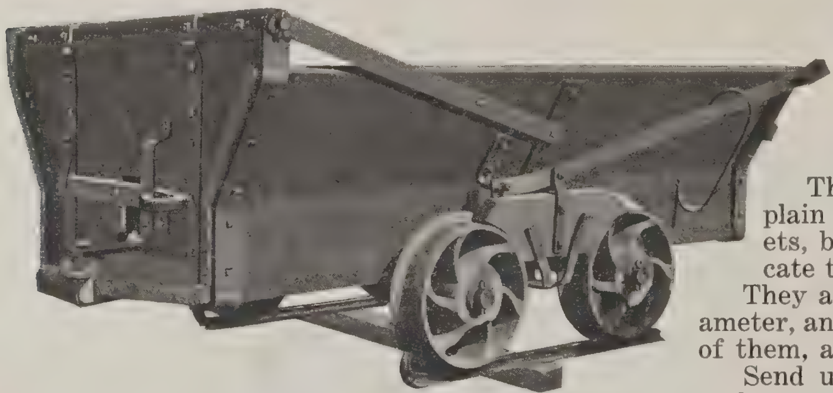
THE STAR MANUFACTURING CO.

New Lexington, Ohio

Manufacturers of Mine Cars, Wheels, Plain and Self Oiling and
Roller Bearing, Axles, Irons and Trucks.

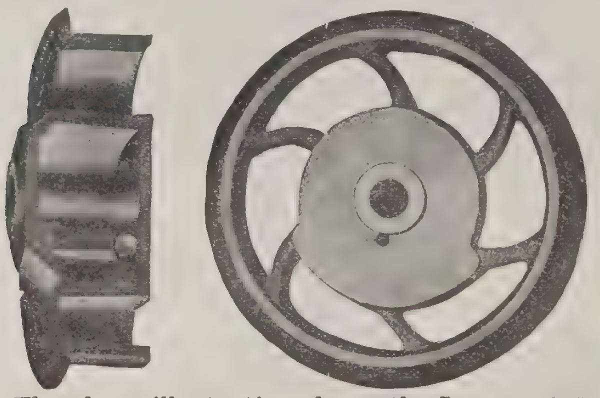
The Star Mine Cars

Built in size and style to suit your mine. All cars are built from specifications or blue prints. We also make up Irons and Trucks for those who prefer to build their own cars at the mine.



Send us your specifications or blue prints for estimates.

The Improved Capless Star Mine Car Wheel



The above illustration shows the Improved Capless Star Mine Car Wheel. Please note there is but one oil hole. This oil hole extends through a cone-like projection cast on the inside of the front wall. The cone shape of this projection catches the oil that is thrown against the wall and prevents it from running out at the oil hole.

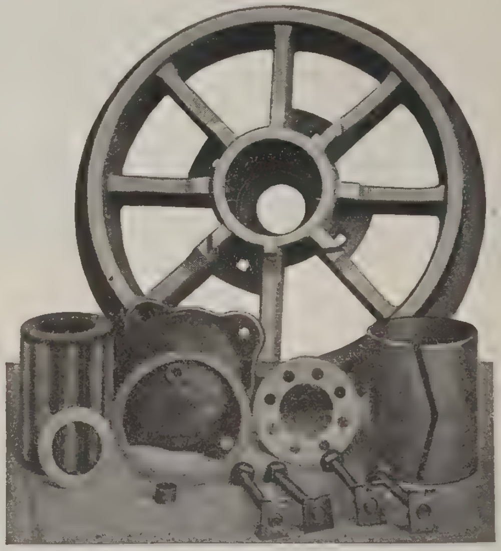
There are no plugs to be unscrewed for oiling, and which must be replaced in order to hold the chamber; neither are there any springs for holding a valve over the oil hole to keep the oil in the chamber. Plugs are liable to be left out, or to lose out, and springs are liable to break, and in either case the oil is lost and the wheel goes dry.

There is no packing to become glazed and filled with paraffine to stop the lubrication. In the hollow hub there is a pocket below the oil hole, and if the chamber is filled with oil, when the wheel is in position, with oil hole just below the spindle, to a level with the bottom of the hole, the level of the oil, when the wheel is turned half way round, will be just below the bottom of the spindle. This prevents leakage of oil around the spindle when the car is standing. No oil can escape except what is used in lubricating the spindle, and this is done by the passing from the chamber through holes in the hub as shown in the cut. One oiling will last for several weeks, depending upon the distance the car travels. On a test, a car was kept in continuous use for six weeks with one oiling, and at the end of the test there was oil sufficient for two more weeks, and no oil had been wasted from the oil hole.

This wheel is just what the cut shows. A plain wheel, with neither caps, bolts or gaskets, but a wheel that will hold oil and lubricate the spindle.

They are made 12, 14, 16 and 18 inches in diameter, and of weights to suit the service required of them, and in either straight or curved spokes.

Send us your specifications for a sample set and prove their merits.



Our Roller Bearing Wheel and Parts.

Roller Bearing Wheel

We also make Roller Bearing Wheels, grease lubricated. The grease is forced into the chamber and around the rollers by a grease gun, which screws into the cap.

The cap is securely bolted to the face of the wheel with gasket to make it grease tight. The grease is held in back of the hub by a washer fitting into a recess of the hub; this allows sufficient grease to escape to lubricate the collar and prevent wear on the hub. The rollers work in a steel casing, which fits tightly in the hub.

We also make oil lubricated roller bearing wheels, using the same oiling device as in the plain wheel.

We are prepared to meet your requirements in any kind of truck, and will build your cars to suit the conditions of your mine.

The Star method of securing the truck to the body of the car insures a perfect alignment of the wheels, and one that will stay to its place during the life of the car. Wheels will not climb the rail or bind on the track. Let us show you why. Testimonials and full description on request.

THE WATT MINING CAR WHEEL CO.

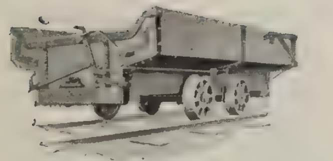
BARNESVILLE, OHIO, U. S. A.

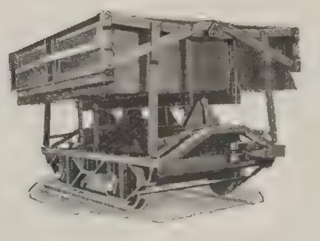
Denver:
Lindrooth, Shubart & Co.

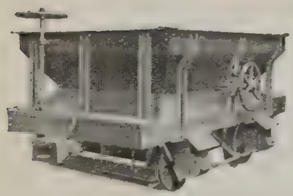
San Francisco:
N. D. Phelps, Sheldon Bldg.

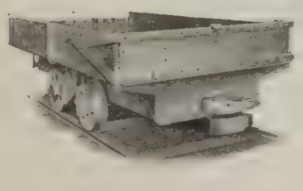
Ask for
Catalogs

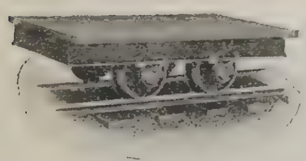
Ask for
Catalogs





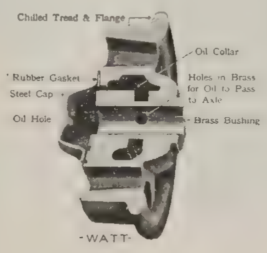






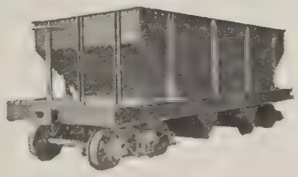
Largest Plant in America

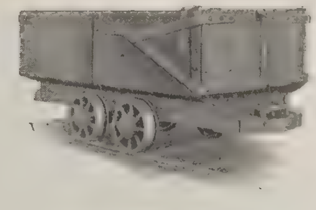
devoted exclusively to the manufacture of Mine Cars (Wood and Steel), Ore Cars, Quarry, Contractors' and Industrial Cars, Skips, Ore Buckets, Car Wheels, Axles and Trucks complete.

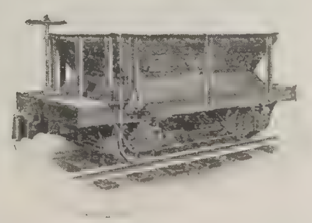


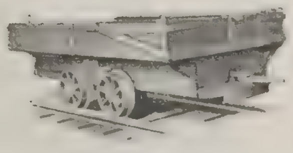
We have gained the confidence of others—

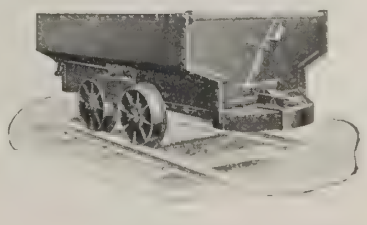
Why not you?











YOUNGSTOWN STEEL CAR CO.

General Offices and Works
YOUNGSTOWN, OHIO

NEW YORK
PHILADELPHIA

Sales Offices
SAN FRANCISCO

SEATTLE
SALT LAKE CITY

Designers and Builders of

Steel Mine Cars

Products

Standard, special steel, and composite mine cars of all descriptions built to customer's specification. We build cars with side, end dump or for rotary dumps, and with plain, self-oiling or roller bearing wheels. "Youngstown" special self-aligning roller bearings. Mine car trucks and angle irons. Steel tipples designed and constructed.

Shop and Location.

The present capacity of our shop is twenty-five standard mine cars a day, and is being constantly increased to meet additional demands. We employ only the most skilled workmen, many of whom have been in our employ from sixteen to twenty years. We are located in the center of iron and coal production on five important trunk lines and we can give you most prompt deliveries.

Send at once for our mine car bulletin.

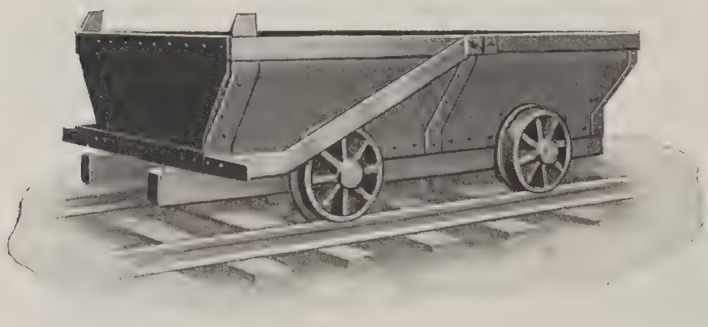


Fig. 1033.
Steel Body Quarry Mine Car, with Left Door.
81 Cu. Ft. Capacity. 48 in. Gauge.

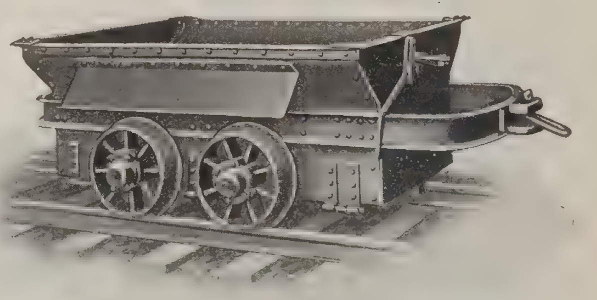


Fig. 1034.
All-Steel Hopper Bottom Mine Car. Height Above Rail 2' 6".
40 Cu. Ft. Capacity. 42 in. Gauge.

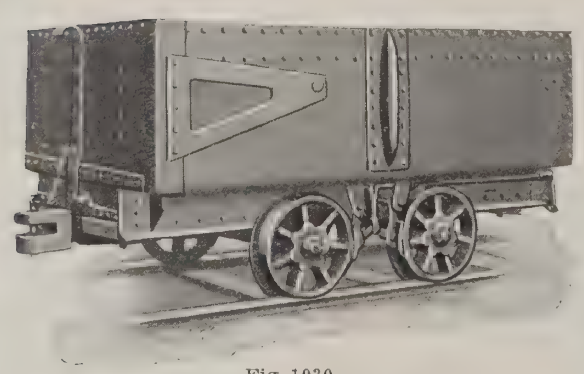


Fig. 1030.
Composite Mine Car, Spring Draft Gear.
100 Cu. Ft. Capacity. 48 in. Gauge.

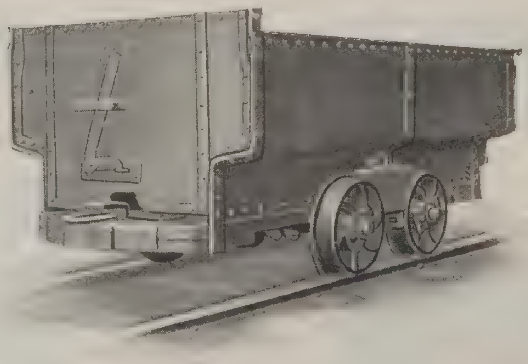
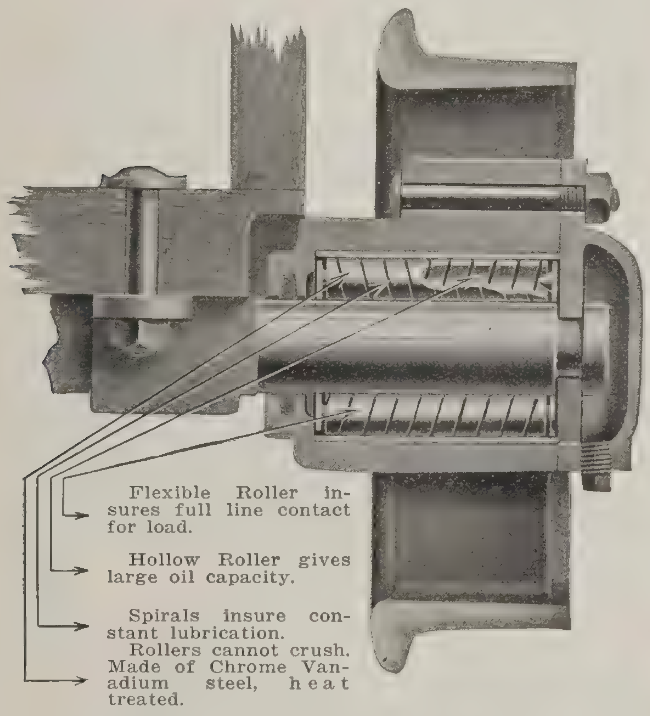


Fig. 1022.
Composite Mine Car, Reinforced Bumper.
84 Cu. Ft. Capacity. 44 in. Gauge.

HYATT ROLLER BEARING CO.

NEWARK, N. J.

The Hyatt Roller Bearing has all the features of other anti-friction bearings and more—the Hollow Flexible Roller. This exclusive feature means less attention for oiling, because the Hollow Roller acts as an oil reservoir and the right and left hand spirals carry oil to every part; reduced wear, because the flexibility insures full line contact and absorbs shocks; self cleaning, in that particles of dirt pass through the spiral slot into the centre of the roller.


Flexible Roller insures full line contact for load.
Hollow Roller gives large oil capacity.
Spirals insure constant lubrication.
Rollers cannot crush. Made of Chrome Vanadium steel, heat treated.

These inherent features make it the logical and practical bearing for mine cars; make it the Bearing of the Highest Practical Efficiency.

In the selection of the Hyatt Bearing it is not necessary to accept or consider only one or two designs of mine car wheels—The Hyatt Bearing has been adopted as a standard by 20 of the most prominent mine car builders as follows:

Watt Wheel & Mine Car Co.	Barnesville, Ohio.
Hockensmith Wheel & Mine Car Co.	Penn Station, Pa.
Phillips Mine & Mill Supply Co.	Pittsburgh, Pa.
Kanawha Mfg. Co.	Charleston, W. Va.
Truax Mfg. Co.	Denver, Colo.
El Paso Fdry & Mchy Co.	El Paso, Texas.
Lobdell Car Wheel Co.	Wilmington, Del.
Eagle Iron Works	Terra Haute, Ind.
Eagle Iron Works	Des Moines, Iowa.
Joshua Hendy Iron Wks.	San Francisco, Cal.
Lake Shore Engine Wks.	Marquette, Mich.
Taylor Wharton Company	Philadelphia, Pa.
Kilbourne Jacobs Mfg. Co.	Columbus, Ohio.
George Brothers	Grass Valley, Calif.
Salt Lake Iron & Steel Co.	Salt Lake City, Utah.
Atlas Car Company	Cleveland, Ohio.
Southern Wheel Co.	Birmingham, Ala.
Southern Wheel Co.	St. Louis, Mo.
Enterprise Foundry & Mchy. Wks.	Bristol, Va., Tenn.
Coeur D'Alene Hardware & Fdry. Co.	Wallace, Idaho.
Wm. J. Oliver Mfg. Co.	Knoxville, Tenn.

Data as to the relative efficiency of the Hyatt Flexible Roller Bearing as compared with solid roller bearings and plain bearings has been accumulated by the Hyatt Company. Tests made under varying conditions, with a specially constructed dynamometer car, justify our claims of a saving in draw bar pull of from 40 to 70%.

The Hyatt dynamometer car is designed for use between the locomotive and the train of cars. It is equipped with recording instruments which automatically record the draw bar pull required to move a train, the speed, and the time required to cover given distances.

This car is a mechanical device—it is not necessary to take into consideration locomotive or motor efficiency or any other doubtful contingent.

Mine car bulletins 306 and 307, and copies of test reports will be sent to any official interested in the reduction of haulage cost.

GRAHAM NUT COMPANY

Established 1874 Incorporated 1903

General Offices
PITTSBURGH, PA.

Works
NEVILLE ISLAND, PA.

GRAHAM
PITTSBURG

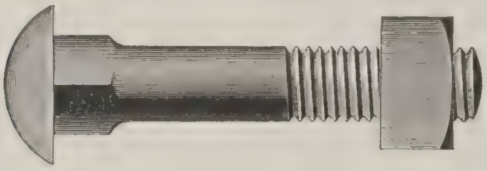
Manufacturers of

GRAHAM
PITTSBURG

Bolts, Nuts, Rivets and Washers

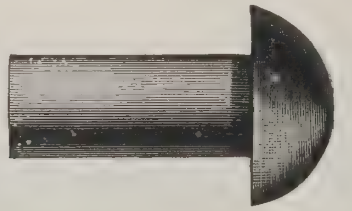
Products

Pit Car Bolts, Carriage Bolts, **Machine Bolts,** Track Bolts, Foundation Bolts, Rods, Lag Screws, Hot Pressed and Cold Punched Nuts, Washers, Rivets, **Special Collars for Mine Car Axles.**



Pit Car and Carriage Bolts

We are prepared to furnish promptly Pit Car and Carriage Bolts.

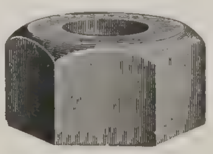


Rivets

We are prepared to furnish high grade Boiler and Structural Rivets ½″ diameter and larger, the same care being maintained in their manufacture, as with all our products, insuring a quality unsurpassed.

Special Collars for Mine Car Axles

We make a specialty of light and heavy collars for shrinking on Mine Car Axles. Standard sized carried in stock. Special sizes to order.



Nuts

Nuts in all sizes from ¼″ to 4″ diameter carried in stock in both hot pressed and cold punched.

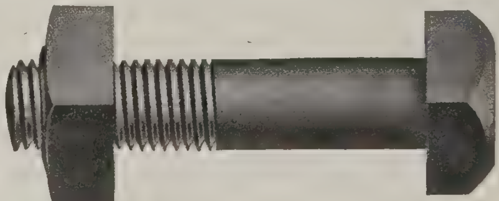
Directions for Ordering Bolts

Give style wanted and note following rules for measurement.

All Square, Hexagon, Button, Round, Cone, Round Head with Square Neck, Square Head with Square Neck are measured from under Head to Point.

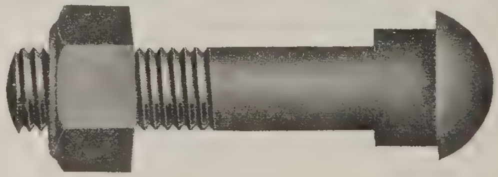
All Plow Bolts, Bolt Ends, Countershank Head Bolts and Rods are measured from end to end over all.

All Pit Car, Common Carriage and Machine Bolts, whether cut or rolled, are threaded U. S. standard. Other bolts follow special standards fixed by long usage.



Machine Bolts

We carry in stock all sizes of Machine Bolts from ¼″ to 1¼″ diameter up to 30″ in length, and are prepared to make larger sizes to order.



Track Bolts

Fitted with Square and Hexagon Nuts.

Standard sizes carried in stock.

Our line includes practically everything in bolts and nuts called for by the trade. In addition we are always prepared to furnish a great variety of special bolts and nuts.

We claim for our various products, a quality and finish superior to many and second to none.

Our equipment comprises machinery of the highest type produced by the leading machinery manufacturers, as well as much special machinery of our own design and is up to the minute in every detail.

Complete catalogue upon request.

JAMES McKAY COMPANY

Works-McKEES ROCKS, PA.

2nd Nat'l Bank Building
PITTSBURGH, PA.

REGISTERED

"McKAY"
A Buy Word For
MINE FORGINGS

Products

Hitchings; Clevises, Pins, Puncher Picks, Mining Bits, Cut Bit Steel, Scraper Heads, Feed Chains, Cage Chains and any kinds of special Chains and Forgings.

Service

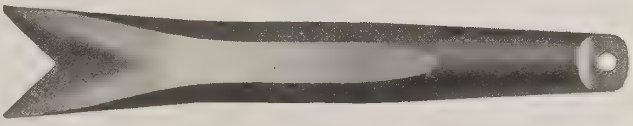
Our plant occupies 10 acres of land, located in the heart of the iron and steel center, backed up by an organization built up from 36 years of successful manufacturing.

We are equipped to manufacture promptly anything in the line of chain or drop forgings, and always carry a large quantity of standard mine forgings in stock.

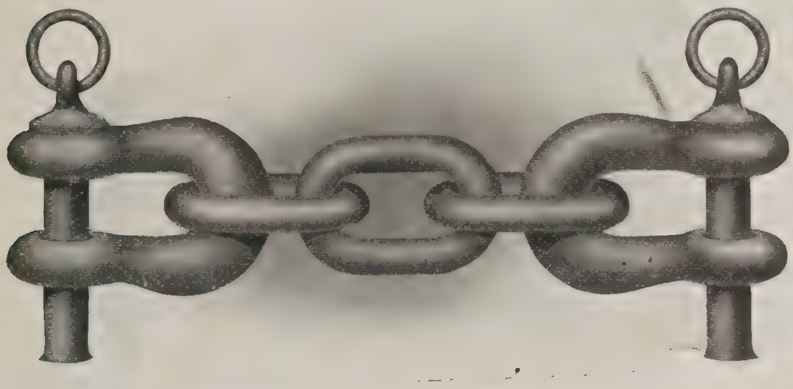
Quality

We have made exhaustive tests and researches to establish the standards of material and workmanship found in our products. It is a demonstrated fact and a pleasure for us to prove that "McKAY" products are the best that can be produced.

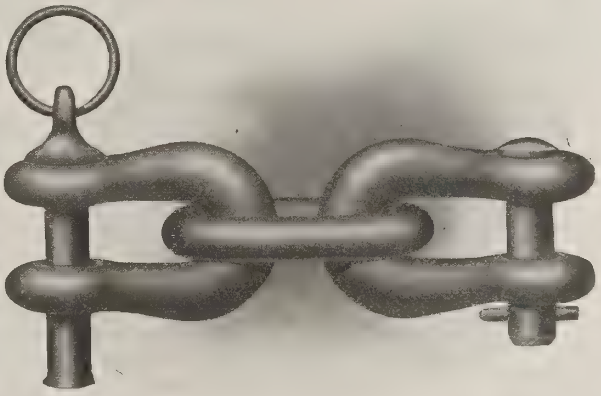
Write us for prices or catalogue.



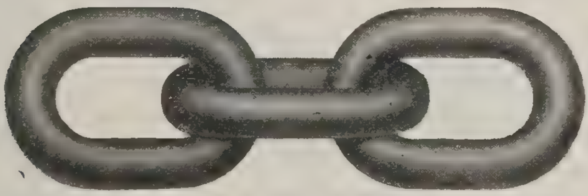
Puncher Picks.



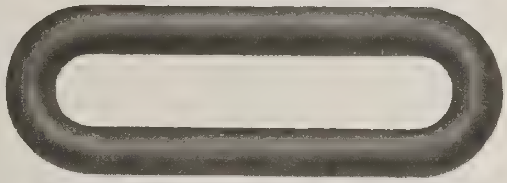
No. 1—Hitching.



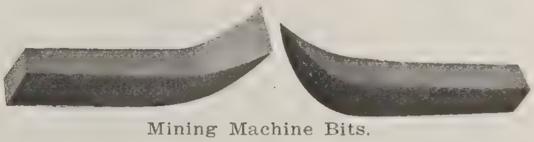
No. 5—Hitching.



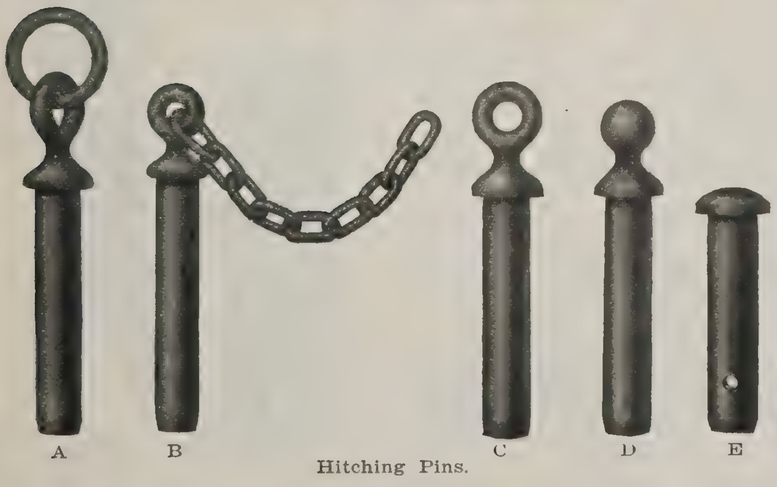
No. 6—3-Link Hitchings.



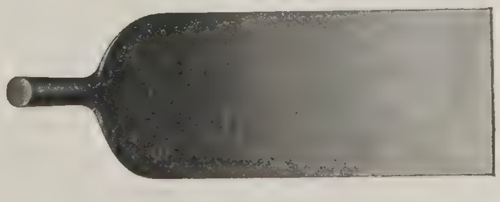
No. 7—Single Link Hitching.



Mining Machine Bits.



Hitching Pins.



Scraper Heads

PITTSBURGH KNIFE AND FORGE CO.

709 Belmont St. North Side
PITTSBURGH, PA.

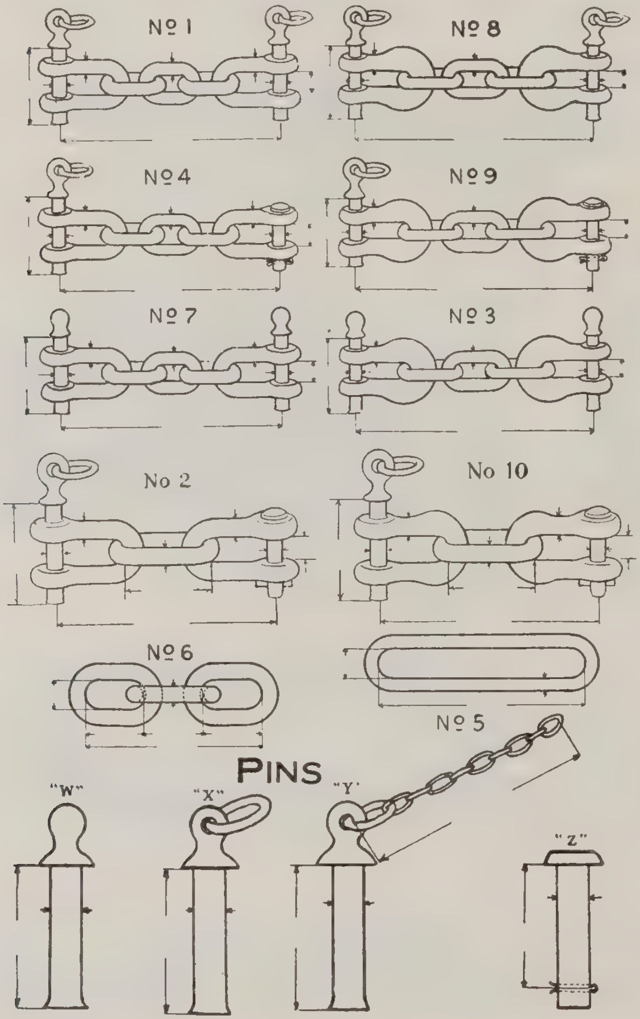
Mine Car Hitchings
(Our Specialty Since 1876)

Products

Mine Car Hitchings, Mine Forgings, Puncher Picks, Mining Machine Bits, and Bit Steel.

We recommend Reinforced Clevis Hitchings as being vastly superior to old style Straight Clevis Hitchings, due to their extra strength and longer life.

Made from SPECIAL DOUBLE REFINED IRON. STRICTLY HAND WELDED.



When sending us your order or writing for prices please give us the following information:

No. of hitchings wanted..
Style of hitching..
Size of Clevis....................Clevis Opening....................
Size of Pins..
Size of Links...
Center to center distance of pins................................

When pins "W," "X" or "Y" are ordered, unless otherwise specified, we will furnish same with swelled ends so they cannot come out of clevises.

When no center to center distance is given we will furnish hitchings of our standard lengths.

Bits

Mining Machine Bits made to fit any machine. They are made of the best Crucible Steel, tempered and drawn to suit any district either pick or chisel-point. They are guaranteed to do more work and cut more coal than any bit on the market.

Our special Bit Steel can be had in any size and cut to any length.

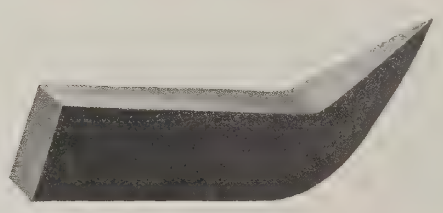
Puncher Picks

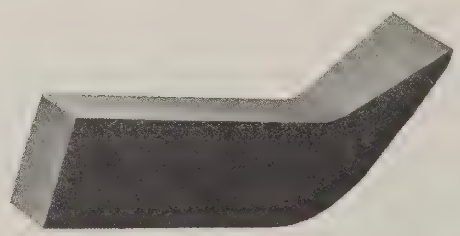
We have made puncher picks ever since they were first used and in our experience have tried out many grades of steel, with the result that we have decided upon two regular grades.

Our No. 2 pick is the best and is made from Crucible Tool Steel. We recommend this pick for extreme cases where the ordinary competition, pick, corresponding with our No. 1 does not give satisfaction.

We are prepared to ship promptly.

Please send us a trial order.


Pick Point
(Right, Left or Straight)


Chisel Point

Bit Steel

Puncher Pick
Fits any
Machine

STANDARD CHAIN COMPANY

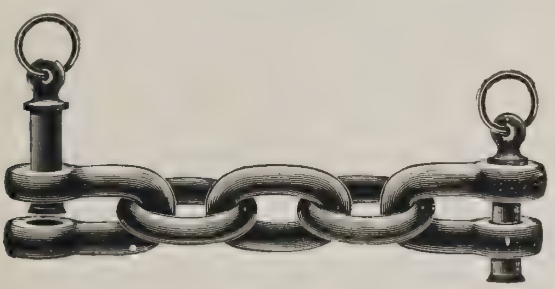
PITTSBURGH, PA.

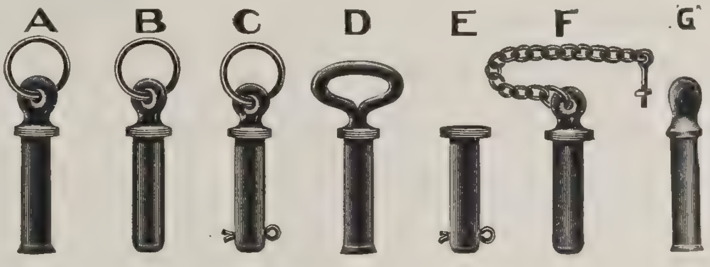
Chain

All kinds and grades, both Fire and Electric Welded, for every purpose.

Hitchings

For mine cars, "Standard" Hitchings are superior in quality, being made from a pure puddled Dredge iron, made in our own rolling mill, and will give you better and safer service than any other.



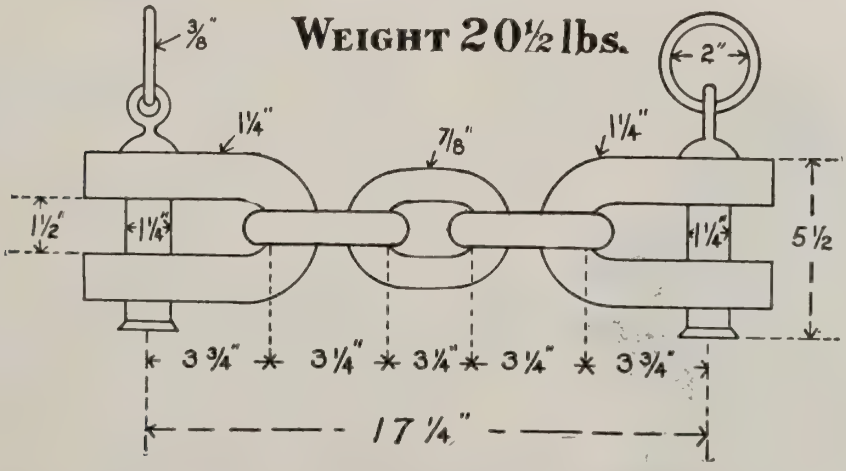


Above illustration shows styles of pins furnished.

Any of these pins furnished with swelled end, straight end or with Cotter pin.

In Ordering

Single links can be furnished any size desired. Give inside length and width.



Dimensions of standard size hitchings carried in stock.
Weight, about
21 Lbs. each.

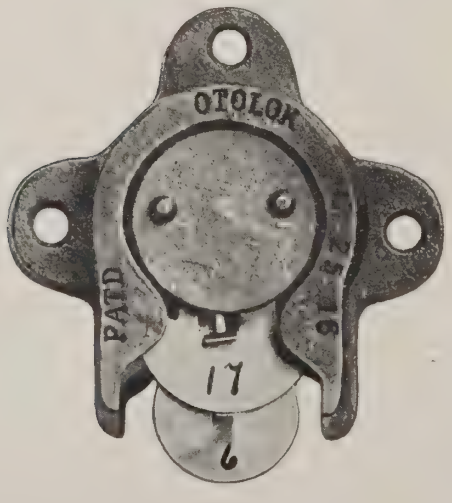
The Mines Otolok Check Company, Inc.

404 House Building, Smithfield and Water Streets
PITTSBURGH, PA.

Not an Experiment but a Proven Fact

The loss of checks has been a great source of dissatisfaction to both operator and miner, and there have been many different experiments tried to overcome this trouble, but none successful till the Otolok Mine Car Check Lock was invented and tried out has there been satisfaction and absolute safety, that when a car is checked in the room that the check is going to reach the checkweighman and the miner gets his proper credit. There is absolutely no chance to lose a check, and they cannot be taken off till car is dumped 45 degrees, the dumping position of car.

We have a number of letters from operators using this device, and among them is the one herewith from one of the oldest and most experienced operators, Mr. H. E. Kinlock, of the Valley Camp Coal Company. His letter should convince the most skeptical that we have the best and only **safe lock** on the market, one that is absolutely guaranteed, and to the operator we want to say that it practically costs them **nothing** to install this system to convince you this is a fact. Open a correspondence with us and we will be glad to **show you** they pay for themselves within twelve months. Looks strange, don't it? but a fact nevertheless. Write for particulars. We want to make your acquaintance and do you some service that you will appreciate.



Valley Camp, Pa.

The Mines Otolok Check Co.:

Gentlemen: Am glad to be able to say that your locks will do the work which you say they will. We have no more trouble with lost or stolen checks.

(Signed) H. E. KINLOCK,
Valley Camp Coal Co.

KEYSTONE
THE.
MINING
CATALOG
COMBINED WITH
COAL FIELD
DIRECTORY
CONSOLIDATED PUBLISHING
COMPANY INC.

SHOP SECTION

The following manufacturers of shop equipment have catalogue descriptions in this section:

Buffalo Foundry & Machine Co.
Imperial Brass Mfg. Co.
Somers, Fitler & Todd Co.
Toledo Pipe Threading Machine Co.

For additional descriptions of Shop Equipment not appearing in this section, refer to Index of Products in front of book.

Per lineal foot
in pounds

WEIGHT OF FLAT IRON

For steel about 2 per cent. should
be added to the weight

Width in Inches	THICKNESS IN INCHES											
	1/16	1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/3	1
1	.21	.42	.63	.84	1.05	1.26	1.47	1.68	2.11	2.53	....	....
1⅛	.24	.47	.71	.95	1.18	1.42	1.66	1.90	2.37	2.84	....	....
1¼	.26	.53	.79	1.05	1.32	1.58	1.84	2.11	2.63	3.16	3.68	4.21
1⅜	.29	.58	.87	1.16	1.45	1.74	2.03	2.32	2.89	3.47	4.05	4.63
1½	.32	.63	.95	1.26	1.58	1.90	2.21	2.53	3.16	3.79	4.42	5.05
1⅝	.34	.68	1.03	1.37	1.71	2.05	2.39	2.74	3.42	4.11	4.79	5.47
1¾	.37	.74	1.11	1.47	1.84	2.21	2.58	2.95	3.68	4.42	5.16	5.89
2	.42	.84	1.26	1.68	2.11	2.53	2.95	3.37	4.21	5.05	5.89	6.74
2¼	.47	.95	1.42	1.90	2.37	2.84	3.32	3.79	4.74	5.68	6.83	7.58
2½	.53	1.05	1.58	2.11	2.63	3.16	3.68	4.21	5.26	6.32	7.37	8.42
2¾	.58	1.16	1.74	2.32	2.89	3.47	4.05	4.63	5.79	6.95	8.10	9.26
3	.63	1.26	1.90	2.53	3.16	3.79	4.42	5.05	6.32	7.58	8.84	10.10
3¼	.68	1.37	2.05	2.74	3.42	4.11	4.79	5.47	6.84	8.21	9.58	10.95
3½	.74	1.47	2.21	2.95	3.68	4.42	5.16	5.89	7.37	8.84	10.32	11.79
3¾	.79	1.58	2.37	3.16	3.95	4.74	5.53	6.32	7.89	9.47	11.05	12.63
4	.84	1.68	2.53	3.37	4.21	5.05	5.89	6.74	8.42	10.10	11.79	13.47
4½	.95	1.90	2.84	3.79	4.74	5.68	6.63	7.58	9.47	11.38	13.26	15.16
5	1.05	2.11	3.16	4.21	5.26	6.32	7.37	8.42	10.53	12.63	14.74	16.84
5½	1.16	2.32	3.47	4.63	5.79	6.95	8.10	9.26	11.58	13.89	16.21	18.52
6	1.26	2.53	3.79	5.05	6.32	7.58	8.84	10.10	12.63	15.16	17.68	20.21
7	1.47	2.94	4.42	5.90	7.36	8.84	10.32	11.79	14.74	17.68	20.64	23.58
8	1.68	3.36	5.05	6.74	8.42	10.10	11.78	13.48	16.84	20.20	23.58	26.94

Melting Points of Metals, in Farenheit

		Degrees.
Alloy, 3 Lead, 2 Tin, 5 Bismuth		200
Alloy, 1 Tin, 1 Lead		370-460
Aluminum		1,160
Aluminum Bronze		1,700
Antimony		950
Bismuth		510
Brass		1,870
Bronze		1,690
Copper		2,000
Gold		2,020
Iron, Cast	(white)	2,075
	(gray)	2,264
Iron, Wrought		3,000-3,500
Lead		610
Magnesium		1,200
Mercury		39
Platinum		3,500
Steel		2,370-2,550
Silver		1,860
Tin		445
Zinc		700

Strength of Wrought Iron Bolts

Diameter of Bolt in Inches.	Safe Load in Pounds.
½	1000
⅝	1800
¾	2750
⅞	3800
1	500
1⅛	62500
1¼	8050
1⅜	10000
1½	11800
1¾	15750
2	20800

Weights of Square and Round Bars of Wrought Iron

In Pounds Per Lineal Foot.—*Kent.*
Iron weighing 480 lbs. per cubic foot. For steel add 2 per cent.

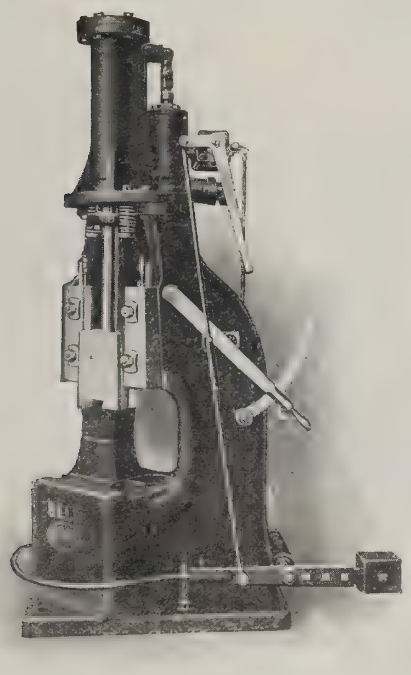
Thickness or Diameter in Inches	Weight of Square Bar One Foot Long	Weight of Round Bar One Foot Long	Thickness or Diameter in Inches	Weight of Square Bar One Foot Long	Weight of Round Bar One Foot Long
0					
1-16	.013	.010	3 1-16	31.26	24.55
1-8	.052	.041	1-8	32.55	25.57
3-16	.117	.092	3-16	33.87	26.60
1-4	.208	.164	1-4	35.21	27.65
5-16	.326	.256	5-16	36.58	28.73
3-8	.469	.368	3-8	37.97	29.82
7-16	.638	.501	7-16	39.39	30.94
1-2	.833	.654	1-2	40.83	32.07
9-16	1.055	.828	9-16	42.30	33.23
5-8	1.302	1.023	5-8	43.80	34.40
11-16	1.576	1.237	11-16	45.33	35.60
3-4	1.875	1.473	3-4	46.88	36.82
13-16	2.201	1.728	13-16	48.45	38.05
7-8	2.552	2.004	7-8	50.05	39.31
15-16	2.930	2.301	15-16	51.68	40.59
1	3.333	2.618	4	53.33	41.89
1-16	3.763	2.955	1-16	55.01	43.21
1-8	4.219	3.313	1-8	56.72	44.55
3-16	4.701	3.692	3-16	58.45	45.91
1-4	5.208	4.091	1-4	60.21	47.29
5-16	5.742	4.510	5-16	61.99	48.69
3-8	6.302	4.950	3-8	63.80	50.11
7-16	6.888	5.410	7-16	65.64	51.55
1-2	7.500	5.890	1-2	67.50	53.01
9-16	8.138	6.392	9-16	69.39	54.50
5-8	8.802	6.913	5-8	71.30	56.00
11-16	9.492	7.455	11-16	73.24	57.52
3-4	10.21	8.018	3-4	75.21	59.07
13-16	10.95	8.601	13-16	77.20	60.63
7-8	11.72	8.204	7-8	79.22	62.22
15-16	12.51	9.828	15-16	81.26	63.82
2	13.33	10.47	5	83.33	65.45
1-16	14.18	11.14	1-16	85.43	67.10
1-8	15.05	11.82	1-8	87.55	68.76
3-16	15.95	12.53	3-16	89.70	70.45
1-4	16.88	13.25	1-4	91.88	72.16
5-16	17.83	14.00	5-16	94.08	73.89
3-8	18.80	14.77	3-8	96.30	75.64
7-16	19.80	15.55	7-16	98.55	77.40
1-2	20.83	16.36	1-2	100.8	79.19
9-16	21.89	17.19	9-16	103.1	81.00
5-8	22.97	18.04	5-8	105.5	82.83
11-16	24.08	18.91	11-16	107.8	84.69
3-4	25.21	19.80	3-4	110.2	86.56
13-16	26.37	20.71	13-16	112.6	88.45
7-8	27.55	21.64	7-8	115.1	90.36
15-16	28.76	22.59	15-16	117.5	92.29
3	30.00	23.56	6	120.0	94.25

Buffalo Foundry and Machine Co.

13 Winchester Avenue BUFFALO, N. Y.

"Bell Steam Hammers"

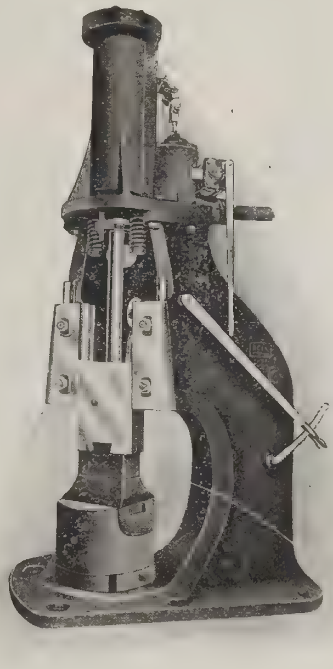
A Steam Hammer pays for itself through improved quality and increased quantity of work where even a single blacksmith fire is operated.



Steel Frame Combined Type.

Built with 100 lb. to 600 lb. falling weights.

Suitable for the lighter classes of general blacksmith and special work. These hammers combine the essential feature of die alignment of the double frame steam drop type with the flexibility of the ordinary type of steam hammer, and can be operated automatically by foot treadle by blacksmith without the service of a helper. They are self-contained and require minimum foundation.



Single Frame Guide Type.

Built with 850 lb. to 5,000 lb. falling weights.

Suitable for the heaviest class of work. Special designs for special work. These hammers have exclusive features of re-inforced guide and stiffened column construction, automatic drainage of water or condensation from bottom of cylinder, unbreakable die-block design and removable cam plate. This combination with other features insures a long life of usefulness at maximum service at the lowest cost for operation and maintenance.

The "Bell" line of Hammers also includes hammers of other types and sizes and covers the complete range of blacksmith and forge work.

Write for Catalog No. 1604 of "Bell" Hammers.

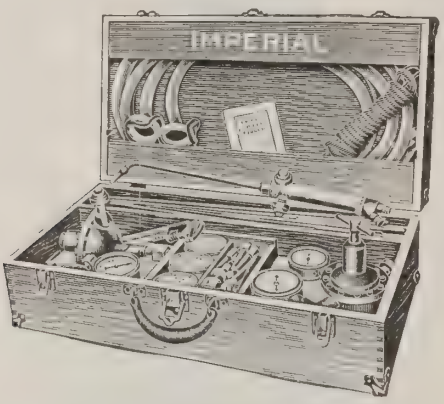
THE IMPERIAL BRASS MFG. CO.

508 South Racine Avenue
CHICAGO

Manufacturers of

Oxy-Acetylene Welding & Cutting Equipment

When castings, machinery or tools break, Imperial equipment can be used to repair them on the spot without delay. An ordinary mechanic can readily learn to operate the torch, which is safe, portabe and economical. Imperial torches weld anything in metal, cut anything in wrought iron or steel.



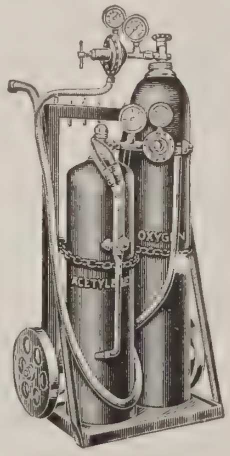
Welding Outfit in Carrying Case.

No other torch has a mixing principle like the IMPERIAL—scientific, practical, years ahead. IMPERIAL TORCHES are approved by the Underwriters' Laboratories of the National Board of Fire Underwriters. No other regulator so accurately and uniformly controls delivery of gases—none has its automatic safety features.

No. 1 Welding Outfit

For all general welding work, from thin sheet metal to heaviest castings. Consists of Type B welding torch with ten welding tips, extension, decarbonizing torch, regulators, gauges, hose, connections, goggles, complete supply of welding materials, ready for service.

Weight, approximately 75 lbs. Net, each $60.00.



Portable Truck.

No. 3 Cutting Outfit

For light and heavy cutting, from tin sheet metal to the heaviest structural iron and similar work. Consists of Type E cutting torch with two housings and four tips, regulators, gauges, hose, connections, goggles, etc., complete, ready for service. Weight, approximately 65 lbs. Net each $75.00.

Welding Broken Casting.

No. 4 Combination Welding and Cutting Outfit.

A splendid equipment for all general work, repair shops, etc. Combination welding and cutting torch performs both operations with one torch. Consists of Type B welding torch with Imperial cutting attachment, ten welding and three cutting tips, decarbonizing torch, regulators, gauges, hose, connections, goggles, complete supply of welding materials, ready for service. Weight, approximately 80 lbs. Net, each $80.00.

No. 5 Duplex Welding and Cutting Outfit.

This is a combination of the Nos. 1 and 3 outfits for both welding and cutting and is the best all-purpose apparatus obtainable at any price, being fully adequate to handle all kinds of welding and cutting within the limits of the process. Consists of a complete No. 1 welding outfit as described, and also includes a type E cutting torch with two housings and four tips and an extra pair of goggles and 25-foot lengths of hose. Weight, approximately 90 lbs. Net, each $95.00.

Trucks

For use with Imperial Welding and Cutting Outfits. A great convenience when outfit is to be frequently moved around shop or yards and prevents breakage of equipment. Net, each $10.00.

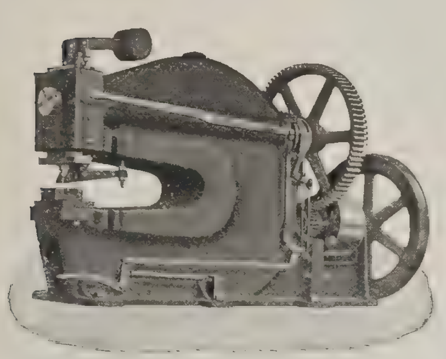
SOMERS, FITLER & TODD CO.

327 Water Street PITTSBURGH, PA. 323 First Avenue

Complete Equipment for Mine Shops

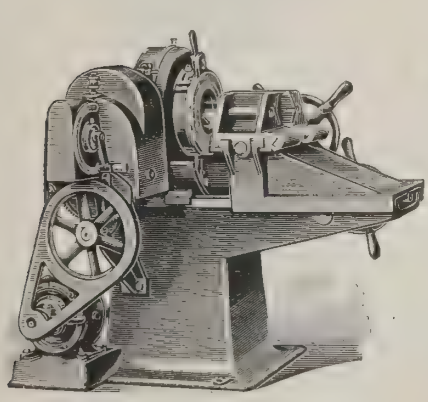
- Pipe Machines
- Power Hack Saws
- Punches and Shears
- Radial Drills
- Upright Drills
- Power Hammers
- Lathes
- Shapers
- Band Saws
- Floor Grinders
- Portable Electric Tools
- Portable Cranes

STANDARD PUNCHES AND SHEARS



Made single or double with either top or bottom drive. We furnish Punching and Shearing Tools in all capacities to suit all classes of work as specified. Complete data and price list on request.

PIPE MACHINES



Motor Driven or Belt Driven

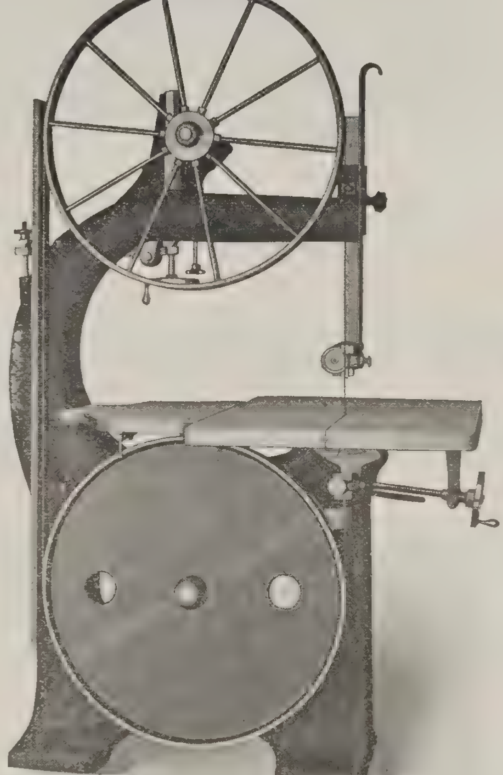
Capacities, ¼ to 2, 1 to 4, 1¼ to 6 and 2½ to 8 inch pipe.

Hand Machines

Capacities, 1¼ to 2, 1 to 4, 1 to 6, 2½ to 4 and 2½ to 6 inch pipe.

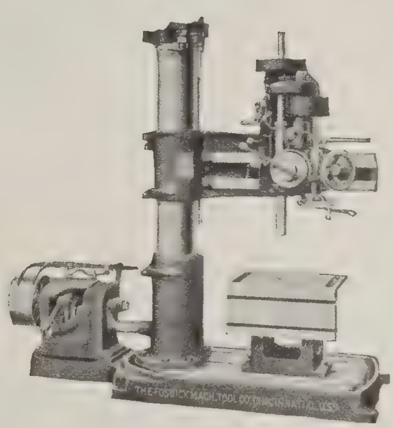
Complete specifications and prices on application.

36-INCH BAND SAW



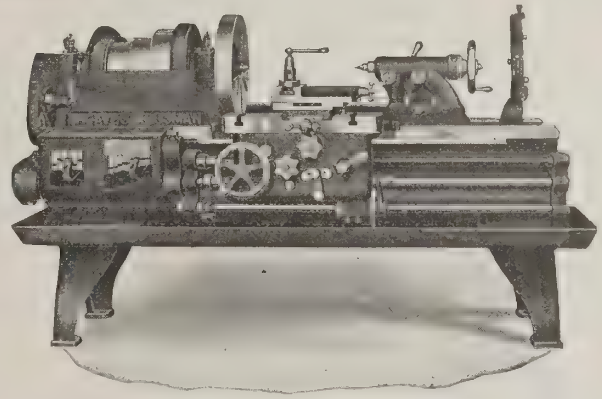
Furnished complete with all equipment and safety guards in compliance with workmen's compensation laws. All sizes from 20″ to 40″ wheels. Complete specifications and prices on application.

HEAVY DUTY RADIAL DRILL



Furnished in all sizes from from 2 to 6 foot arm. Catalog showing complete line of Radial Drills mailed on request.

ENGINE LATHE



Heavy Quick-Change Type

With Three-Step Cone and Friction Double Back Gears.

Furnished promptly in 16, 18, 20, 22, 24 and 30 inch sizes.

Specifications and prices on application.

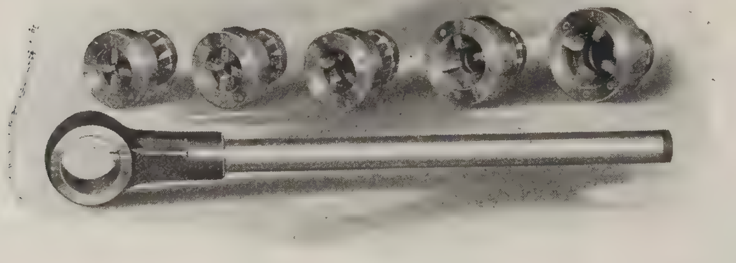
We Are Also Large Distributors of Mill, Mine and Manufacturers' Supplies. 1200-Page General Machinery and Supply Catalogue Furnished on Request.

The Toledo Pipe Threading Machine Co.

Manufacturers of

TOLEDO HAND OPERATED PIPE THREADERS

1445 Summit St. Toledo, Ohio
NEW YORK OFFICE, 1182 BROADWAY



The New "Toledo" No. 00—⅛" to ¾" Ratchet Pipe Threader.
The Simplest, Handiest, Most Efficient Small Pipe Threader on the Market.
List Price, With Oak Case, complete, $20.00

"Toledo" Pipe Threaders

Are to-day the recognized standard of hand operated pipe threading tools. Wherever efficiency is a factor on the pipe threading jobs, there you will always find a "Toledo."

It is now possible, with the introduction of the new "Toledo" No. 00 tool, shown above, to purchase "Toledos," utilizing a ratchet, to thread any size of pipe from ⅛" to 12", inclusive.

"Toledos" cut threads with a long, constant taper—a positive guarantee against leaks. Every "Toledo" is strong, simple and durable, but so light and compact that even the 12" threader can be taken to any job and the threads cut.

Thousands are in use to-day in the mining operations throughout the country.

Pipe Cutters—

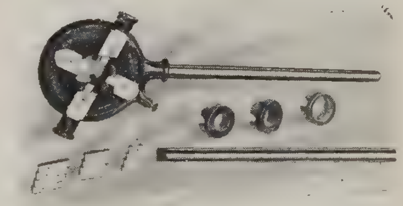
That cut off pipe, leaving no burr and making a clean, straight cut, are the "Vosper" and the No. 250, here shown. Both are exceedingly efficient.

"Toledo" Pipe Vises—

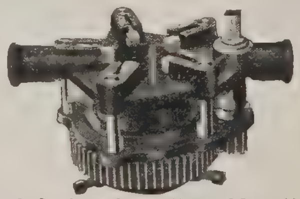
Will hold any shaped fitting or valve that will go between the jaws. The No. 1 has a capacity of ⅛" to 2½"; the No. 2 a capacity of ⅛" to 4½".

"Toledo" Vise Mounts—

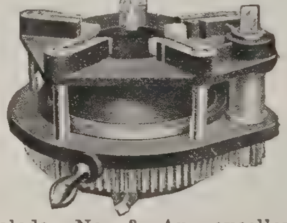
Are an excellent, portable, collapsible substitute for the heavy, cumbersome work bench.



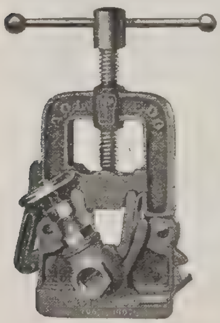
Toledo No. 1A—A 1" to 2" Ratchet Tool for close quarters.
List Price $30.00



Toledo No. 2—A Portable 2½" to 4" One-Man Ratchet Threader.
Pist Price $100.00



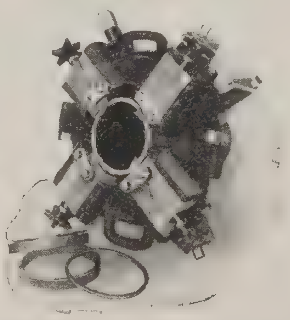
Toledo No. 3—An excellent Ratchet Tool, Cutting 4½" to 8" Threads.
List Price $300.00



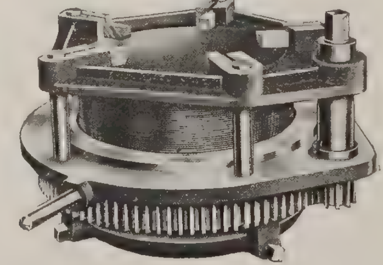
Toledo Vises Hold any Shape Fitting or Valve.

Drop us a card for our new Catalogue "K."

Vosper Pipe Cutter—Cuts off ½" to 2" Pipe Without Burrs.
List Price $16.00



Toledo No. 250 Pipe Cutter. A 2½" to 6" Ratchet Cutter.
List Price $80.00



Toledo No. 4—Operating a Ratchet. One man threads 9" to 12" Pipe With This Tool.
List Price $500.00

KEYSTONE
THE.
MINING
CATALOG
COMBINED WITH
COAL FIELD
DIRECTORY
CONSOLIDATED PUBLISHING
COMPANY INC.

UNIVERSITY OF ILLINOIS LIBRARY
FEB 5 - 1921

REPAIRS,---NEW AND USED MACHINERY SECTION

The following dealers have catalogue descriptions in this section:

Glow Electric Co.
McCoy-Brandt Machinery Co.
Miller-Owen Electric Co., Inc.
Pittsburgh Reinforced Brazing & Machine Co.
Winterer, Herman L.

For additional descriptions of Repairs,---New and Used Machinery, not appearing in this section, refer to Index of Products in front of book.

THE GLOW ELECTRIC CO.

219-21 Walnut St., Cincinnati, Ohio
Long Distance Phone, Main 1795

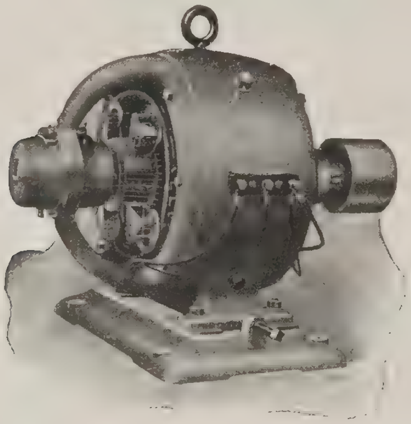
Dealers in

Rebuilt Motors, Generators, Fans, Motor Generator Sets, Arc Lamps, Switchboards and Everything Electrical

---

Motors and Generators

Economy is a big word in business. It is the important step between success and failure. But there is a difference between buying a cheap article and making an economical purchase. A new motor or generator of an inferior make may be cheap, but a rebuilt machine of a standard make, guaranteed by us for a year and sold at from 20 to 50 per cent. of the original price, is a purchase representing real economy.



D. C. Motor.

We have in stock at all times, D. C. Motors from 1/40 to 100 horse-power, having a wide range of speeds and at varying prices. These have all been rebuilt in our shop and will give as satisfactory service as a new machine. Any machine will be sent on trial, subject to return if not satisfactory in every respect and exactly as represented. Pulley, starting box or rheostat furnished with machines above ¼ H. P. Our guarantee goes with every machine. Get a copy of our Bargain List.

Exhaust Fan.

Repair Work

Quick service on repair work means money saved for you when you have a break down. Our shop is equipped with every up-to-date feature to turn out the highest grade repair work on short notice. Rewinding and alterations in motors, generators and switchboards. All work fully guaranteed.

Motors Rented

For emergency service, to replace a broken-down machine, we can furnish motors or generators of any size and capacity at moderate rates. This means a great saving in time when time means money.

OUR SERVICE

When a mining engineer wants something, he usually wants it in a hurry. A wait often means money lost. The **hurry-up order** is our specialty, not only on goods bought, but on machines rented for emergency service and repairs. Wire us for what you need. Our stock is so complete that we can almost invariably furnish it at once. A telegraphic order means goods on the way to you within a few hours at most, and in the case of repairs immediate attention and the apparatus returned to you with the least possible delay.

BE SURE THAT YOUR NAME IS ON OUR MAILING LIST.

McCOY-BRANDT MACHINERY CO.

Office and Warehouse: 216-218 Penn Avenue

PITTSBURGH, PA.

MACHINERY---EQUIPMENT

NEW AND USED

For

MILLS, MINES AND CONTRACTORS

Products

- Air Compressors
- Belting
- Bending Rolls
- Boring Mills
- Boilers
- Bolt Machinery
- Bulldozers
- Contractors' Equipment
- Corliss Engines
- Cranes, Electric Traveling
- Cranes, Locomotive
- Crushers
- Drill Presses
- Forge Shop Equipment
- Foundry Equipment
- Gas Engines
- Generators
- Grinders
- Hammers, all types
- Hoists, Electric, Steam
- Hydraulic Equipment
- Haulage and Hoisting Machinery
- Lathes
- Locomotives, Electric, Gas, Steam
- Locomotive Cranes
- "Little Giant" Hammers
- Milling Machines
- Mining Machinery and Equipment
- Mine Locomotives, Electric, Gasoline
- Mine Locomotives, Storage Battery
- Motors
- Motor Starters (Allen-Bradley)
- Nut Machinery
- Pipe Machines
- Planers—(Metal, Wood)
- Presses—all types
- Pulleys—Big Stock
- Pumps
- Punches and Shears
- Rolls—Bending, Straightening
- Radial Drills
- Saws—Hot, Cold
- Screw Machines
- Shapers
- Shears and Punches
- Steam Engines
- Steam Shovels
- Testing Machines
- Turret Lathes

TURN

Your Idle Equipment

Into Cash.

Send Us Details and Prices.

REMEMBER

GOOD
Second-Hand Machines
of Standard Makes
Are a Better Purchase
Than CHEAP New
MACHINES

Think it over!

We Are

MANUFACTURERS'
AGENTS

For

Machine Tools
of
Every Description.

We Solicit
YOUR
Inquiries.

YOUR INQUIRIES

Solicited.

Send For OUR LIST.

WE BUY—SELL—EXCHANGE.

MILLER-OWEN ELECTRIC CO., INC.

Pittsburgh's Electrical Clearing House

"Square Dealing" "Quality" "Security"

Office
217-219 First Ave.

Warerooms—Shop
217-219-233 First Ave.

Pittsburgh, Pa.

Phones 2697-1713 Court—2251 Pitt

OVERHAULED—GUARANTEED—SECOND HAND AND NEW

Steam and Electric Machinery

We Buy Sell, Repair and Exchange

Our Products

Motors, Generators, Switchboards, Electric Hoists, Motor-Generator Sets, Rotary Convertors, Steam Electric Units, Rheostats, Gas Electric Units, Electric Pumps, Electric Mine Equipment, Motor Accessories, a large variety always in stock and available.

Our Facilities

Warerooms with a total of 30,000 sq. ft. of floor space used to store equipment which has been overhauled and tested and is ready for prompt delivery. A shop equipment used exclusively for overhauling our used apparatus. A force of expert mechanics and electricians supervised by a thoroughly practical and technical engineer. Complete facilities for making thorough operating tests. An organization devoted to the rebuilding of staple modern equipment.

Our Policy and Guarantee

We guarantee all equipment purchased from us to be free from electrical and mechanical defects and in strictly first-class operating condition. We will accept the return of equipment sold by us and proving unsatisfactory and allow credit in full or refund purchase price if returned within 30 days after date of sale.

We handle exclusively modern equipment of established reputation.

Our prices will effect you a saving of from 50% to 25% over the cost of similar new equipment.

Pittsburgh Reinforced Brazing & Machine Co.

Office and Works:

2525 Liberty Ave. Pittsburgh, Pa.

BRAZERS WELDERS AND GENERAL MACHINISTS

15-ton Mine Locomotive, Side Frames and Bumper.

10" Dia. Forged Steel Steam Hammer Piston Rod.

2500 H. P. Steam Engine Bed Plate.

Reinforced Brazing

is the method used whereby we can restore any heavy cast iron casting to its original strength, or in fact we can reinforce it to make it stronger at the point of fracture than it was originally.

Electric Mine Locomotive side frames, bumpers, gear wheels, etc., are permanently repaired in this manner.

Oxygen-Acetylene Welding

As used by us will restore to perfect condition gas engine, steam or compressor cylinders of any size or description, gear wheels, pumps, etc., and boiler repairs of any nature.

Thermit Welding

will restore to original strength and durability broken crank shafts, connecting rods, boat shafts or heavy steel castings of all kinds.

Electric Welding

is also employed by us extensively in the building up of worn spots in castings, forgings, etc., and plate welding.

By one of the above processes we can permanently restore to original strength any casting regardless of size, weight or metal.

HERMAN L. WINTERER

908-910 Beach Street
PHILADELPHIA, PA.

General Machinery

Immediate Deliveries Rebuilt and Guaranteed
Modern and High Grade Machinery of Every Description

We carry in stock at Philadelphia a Complete Stock of the following types of New and Rebuilt Machinery:

BOILERS
Water Tube.
Horizontal.
Vertical and
Locomotive.
All Sizes.
PUMPS
Duplex and Single.
High and Low Pressure.
Steam and Belt.
AIR COMPRESSORS
Belt and Steam Driven.
ENGINES
Corliss.
Automatic and
Slide Valve.

HOISTING ENGINES
HEATERS
Open and Closed Type.
MACHINE TOOLS
Lathes.
Planers.
Shapers.
Milling Machines.
Drill Presses.
Radial Drills.
Etc., Etc.
Pulleys.
Shafting.
Hangers.
Belting and
General Mine Supplies.

FOR EVERY DUTY

I personally supervise the overhauling of all Machinery, and when the same leaves our place it will be guaranteed first class in every respect.

SEND FOR COMPLETE CATALOGUE OF STOCK. CORRESPONDENCE SOLICITED

KEYSTONE
CONSOLIDATED PUBLISHING
COMPANY INC.

THE MINING CATALOG
COMBINED WITH
COAL FIELD DIRECTORY

TRACK SECTION

Engineering Data

Specifications and Dimensions of Light Steel Rails.

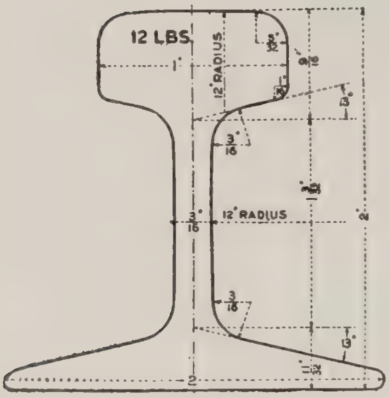
Rail Data.

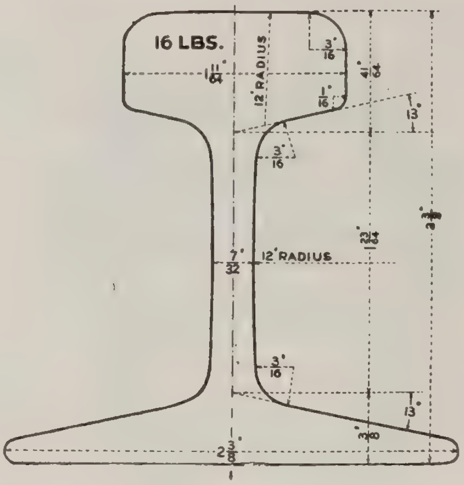
Curvature of Track—Table.
Frog and Switch Data.

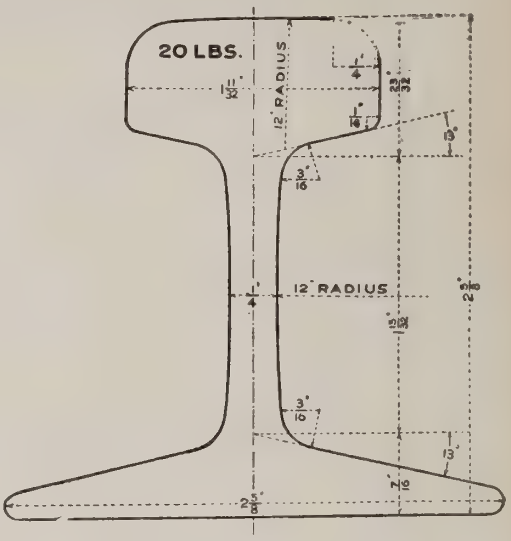
The following manufacturers and dealers have catalogue descriptions in this section:

Buckeye Rolling Mill Co.
Cambria Steel Co.
Cincinnati Frog & Switch Co.
Clinton Switch Co.
Elliot Frog & Switch Co.
Fairmont Mining Machinery Co.
Foster, L. B., Co.
Frank, M. K.
Green, L. A.,
Indianapolis Switch & Frog Co.
Kilby Frog & Switch Co.
Lazarus, M. E. Co., The.
Light Railway Equipment Co.
Richardson & Co., The.
Sweet's Steel Co.
United States Rail Co.
Weir Frog Co.
West Virginia Rail Co.
Wharton, Wm. Jr., & Co., Inc.

For additional descriptions of Track Equipment, not appearing in this section, refer to Index of Products in front of book.



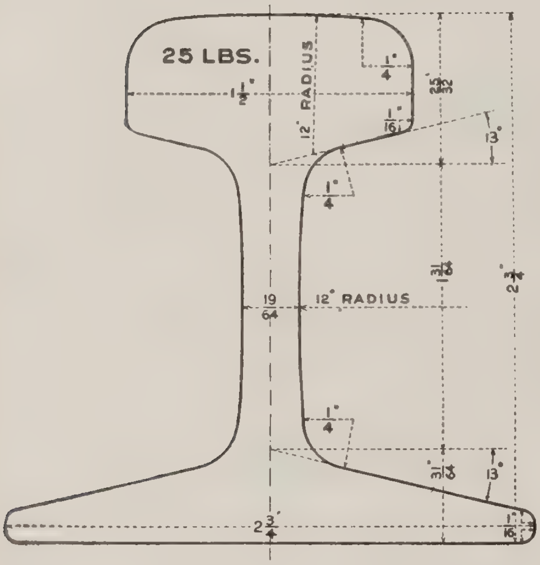


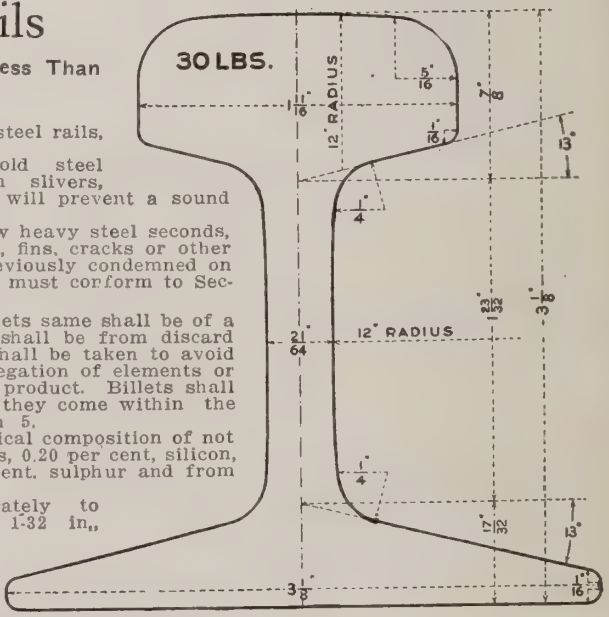


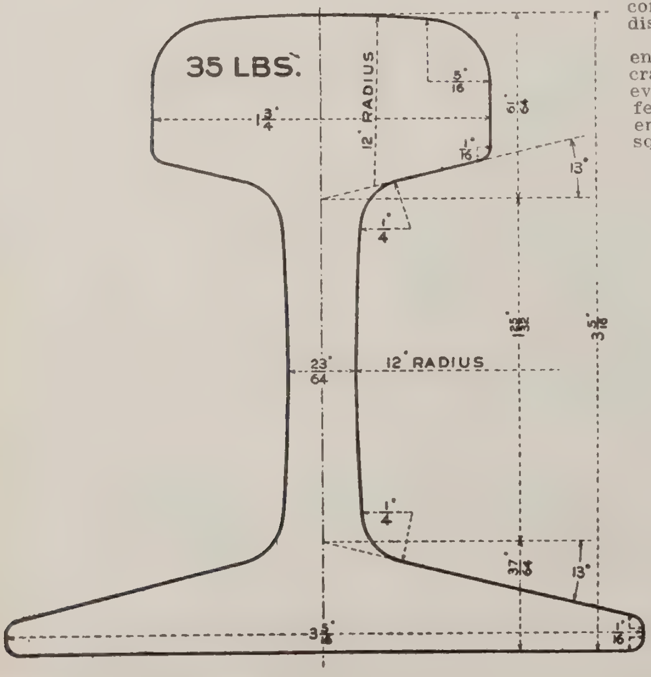
Light Steel Rails

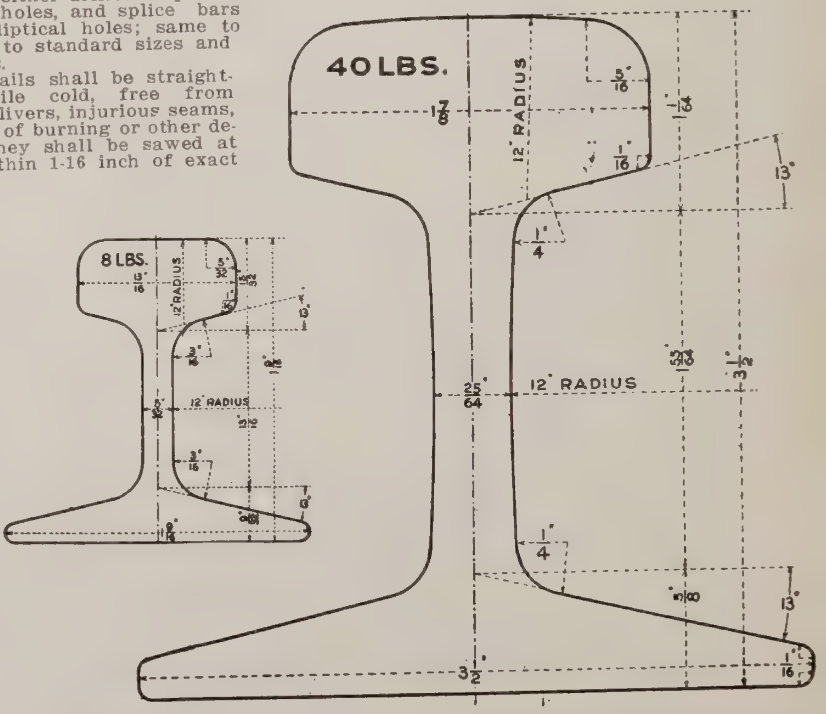
A. S. C. E. Sections, Weighing Less Than 45 Pounds Per Yard.

1. Rails may be rolled from old steel rails, heavy seconds or from billets.
2. When rails are rolled from old steel rails, the stock shall be free from slivers, fins, cracks or other defects which will prevent a sound finished product.
3. When rails are rolled from new heavy steel seconds, the stock must be free from slivers, fins, cracks or other defects, and must not have been previously condemned on account of chemical analysis, which must conform to Section 5 below.
4. When rails are rolled from billets same shall be of a uniform character of steel. None shall be from discard of ingots, and special precautions shall be taken to avoid the use of billets with piping, segregation of elements or slag which will roll to an unsound product. Billets shall not be used from off heats, unless they come within the chemical analysis given in Section 5.
5. Rails shall conform to a chemical composition of not more than 0.10 per cent. phosphorous, 0.20 per cent, silicon, 0.80 per cent. manganese, 0.06 per cent. sulphur and from 0.30 to 0.50 per cent. carbon.
6. Section shall conform accurately to template. A variation in height of 1-32 in., either more or less, will be permitted.
7. Rails will be accepted and paid for according to weight, and a variation of 1 per cent permitted.
8. The Standard length of rails shall be 30 ft., with mill lengths down to 22 ft., permitted.
9. Rails to be either drilled or punched with circular holes, and splice bars punched with elliptical holes; same to conform to standard sizes and distances.
10. Rails shall be straightened while cold, free from cracks, slivers, injurious seams, evidence of burning or other defects; they shall be sawed at ends within 1-16 inch of exact square.





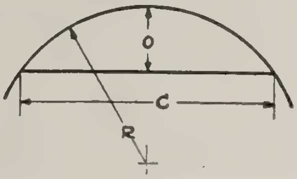




Courtesy United States Rail Co.

Frog and Switch Data

Curvature of Track Rails



Middle Ordinates (O) for Curves of Various Radii (R), on Chords (C) of Various Lengths.

Curvature		Length of Chord (C), Feet					
		10	15	20	25	30	50
Radius (R), Feet	Degrees	Height of Ordinate (O), Inches					
10	....	16.08	40.56	120.00	......	......	......
15	....	10.33	24.24	45.85	80.40	180 00	......
20	286° 38′ 36″	7.69	17.28	32.16	52.55	81.25	......
25	229° 18′ 27″	6.00	13.56	25.10	40.20	60.00	300.00
30	191° 5′ 25″	4.20	10.67	17.53	27 66	40.60	120.00
50	114° 39′ 17″	3.00	6.84	12.12	19.07	27 66	84.00
75	76° 26′ 10″	2.01	4.56	8.04	12.50	18 20	51 56
100	57° 19′ 38″	1.51	3.36	6.03	10.02	13.58	38.20
125	45° 51′ 42″	1.20	2 76	4 81	7.51	16 86	30.32
150	38° 13′ 5″	1.01	2 28	4.01	6.31	9.03	26.00
200	28° 39′ 49″	.77	1 74	3.00	4.69	6.78	18.84
250	22° 55′ 51″	.60	1 44	2.40	3.76	5.41	15 06
500	11° 27′ 56″	.30	72	1.21	1.87	2.71	7.52
750	7° 38′ 37″	.22	.46	.80	1.32	1.81	5.01
1000	5° 43′ 58″	.16	.34	.60	.94	1.36	3.76

Courtesy Goodman Manufacturing Co.

Give the following data when sending inquiries:

Height of rail ....

Weight of rail ....

Distance from end of rail to center of first splice hole. ....

Distance from center of first splice hole to center of second splice hole. ....

Angle in degrees and minutes or number of Frog. ....

Length of switch points. ....

Gauge of track ....

FROG AND SWITCH DATA

No. Frog	Spread Per Foot	Frog Angle	RADIUS CURVE IN FEET					Switch Points Suitable Lengths
			Gauge 3′ 0″	Gauge 3′ 6″	Gauge 3′ 8″	Gauge 4′ 0″	Gauge 4′ 8½″	
1	12″	53° 0′	6.00	7.00	7.33	8.00	9.41	4′ 0″
1¼	9 5/8″	43° 40′	9.36	10.93	11.44	12.50	14.68	4′ 0″
1½	8″	36° 52′	13.50	15.75	16.50	18.00	21.19	4′ 0″
1¾	6 7/8″	31° 53′	18.31	21.44	22.44	24.42	28.74	4′ 0″
2	6″	28° 04′	24.00	28.00	29.33	32.00	37.65	5′ 0″
2¼	5 11/32″	25° 03′	30.37	35.44	37.12	40.50	47.67	5′ 0″
2½	4 13/16″	22° 37′	37.50	43.75	45.83	50.00	58.85	5′ 0″
2¾	4 3/8″	20° 37′	45.37	52.94	55.44	60.50	71.71	5′ 0″
3	4″	18° 55′	54.00	63.00	66.00	72.00	84.75	7′ 0″
3¼	3 11/16″	17° 30′	63.37	73.94	77.37	84.50	99.46	7′ 0″
3½	3 15/32″	16° 16′	73.50	85.75	90.00	98.00	115.27	7′ 0″
3¾	3 3/16″	15° 11′	84.37	98.44	107.21	116.96	137.57	7′ 0″
4	3″	14° 15′	96.00	112.00	117.33	128.00	150.66	7′ 0″
4¼	2 27/32″	13° 26′	108.37	126.43	132.45	144.50	169.79	7′ 0″
4½	2 21/32″	12° 41′	121.50	141.75	148.50	162.00	190.60	10′ 0″
5	2 13/32″	11° 25′	150.00	175.00	183.33	200.00	235.40	10′ 0″

Courtesy Helmick Fdy. & Machine Co.

RAILROAD SPIKES

Size Measured Under Head	Average No. per Keg of 200 Lbs.	Ties Two Feet Between Centers; Four Spikes per Tie Makes per Mile	Rail Used Weight per Yard
5½x9-16	360	5920 lbs. 29 1-3 kegs	45 to 100
5 x9-16	405	5230 lbs. 26 kegs	40 to 56
4½x9-16	460	4606 lbs. 23 kegs	35 to 40
5 x½	505	4460 lbs. 21 kegs	
4½x½	535	3960 lbs. 19 4-5 kegs	30 to 35
4 x½	605	3515 lbs. 17½ kegs	25 to 35
3½x½	670	3180 lbs. 15⅞ kegs	20 to 30
4½x7-16	690	3090 lbs. 15½ kegs	
4 x7-16	780	2739 lbs. 13 3-5 kegs	
4½x⅜	780	2730 lbs. 13 3-5 kegs	16 to 25
3½x7-16	890	2377 lbs. 12 kegs	
4 x⅜	1025	2044 lbs. 10 1-5 kegs	
3½x⅜	1250	1740 lbs. 8½ kegs	16 lbs.
3 x⅜	1380	1592 lbs. 8 kegs	
2½x⅜	1650	1280 lbs. 6 2-5 kegs	12 lbs.

RAILS

Tons per mile required of following weights per yard.

Weight per Yard	Tons 2240 Lbs. per Mile.
12 lbs.	18.86
16 lbs.	25.14
20 lbs.	31.43
25 lbs.	39.29
30 lbs.	47.14
35 lbs.	55.00
40 lbs.	62.86
45 lbs.	70.71
50 lbs.	78.56
56 lbs.	88.00
60 lbs.	94.29
65 lbs.	102.14
70 lbs.	110.00
75 lbs.	117.86
80 lbs.	125.71
85 lbs.	133.57
90 lbs.	141.43
100 lbs.	157.14

CROSS TIES

Per Mile.

Center to Center.	No. Ties
18 inches	3520
21 inches	3017
24 inches	2640
27 inches	2348
30 inches	2113

SPLICE JOINTS

Per Mile

Two bars to each joint.

Rails	20 feet long	528	joints.
Rails	24 feet long	440	joints.
Rails	30 feet long	352	joints.
Rails	33 feet long	320	joints.

Courtesy W. Va. Rail Co.

Comparative table showing price in Gross Tons of 2240 lbs. with corresponding price in Net Tons of 2000 lbs. and price per Cwt.

Gross Ton	Net Ton	Cwt.	Gross Ton	Net Ton	Cwt.
$25.00	$22.32	$1.116	$32.75	$29.24	$1.462
25.25	22.54	1.127	33.00	29.46	1.473
25.50	22.76	1.138	33.25	29.68	1.484
25.75	22.99	1.149	33.50	29.91	1.495
26.00	23.21	1.160	33.75	30.13	1.506
26.25	23.43	1.171	34.00	30.35	1.517
26.50	23.66	1.183	34.25	30.58	1.529
26.75	23.88	1.194	34.50	30.80	1.540
27.00	24.10	1.205	34.75	31.02	1.551
27.25	24.33	1.216	35.00	31.25	1.562
27.50	24.55	1.227	35.25	31.47	1.573
27.75	24.77	1.238	35.50	31.69	1.584
28.00	25.00	1.250	35.75	31.91	1.595
28.25	25.22	1.261	36.00	32.14	1.607
28.50	25.44	1.272	36.25	32.36	1.618
28.75	25.66	1.283	36.50	32.58	1.629
29.00	25.89	1.294	36.75	32.81	1.640
29.25	26.11	1.305	37.00	33.03	1.651
29.50	26.33	1.316	37.25	33.25	1.662
29.75	26.56	1.328	37.50	33.48	1.674
30.00	26.78	1.339	37.75	33.70	1.685
30.25	27.00	1.350	38.00	33.92	1.696
30.50	27.23	1.361	38.25	34.15	1.707
30.75	27.45	1.372	38.50	34.37	1.718
31.00	27.67	1.383	38.75	34.59	1.729
31.25	27.90	1.395	39.00	34.82	1.741
31.50	28.12	1.406	39.25	35.04	1.752
31.75	28.34	1.417	39.50	35.26	1.763
32.00	28.57	1.428	39.75	35.49	1.774
32.25	28.79	1.439	40.00	35.71	1.785
32.50	29.01	1.450			

RULE:

To convert price per Gross Ton into price per net ton, divide by 1.12.

To convert price per Net Ton into price per Gross Ton, multiply by 1.12.

To convert price per Gross Ton into price per 100 lbs. divide by 22.4.

Courtesy W. Va. Rail Co.

THE BUCKEYE ROLLING MILL CO.

General Offices: Steubenville, O.

MILLS, NEWARK, OHIO.

BRANCH OFFICES:
CHICAGO, ILL.—Wilmer Wickersham, 1850 Peoples Gas Bldg.
CLEVELAND, OHIO—The Hamill-Hickox Company, Hickox Bldg.
KNOXVILLE, TENN.—Webster & Company, Holston Bank Bldg.
MIDDLESBORO, KY.—Webster & Company.
ST. LOUIS, MO.—C. E. Hutchinson, Suite 913 Federal Reserve Bank Bldg.
NEW YORK, N. Y.—Hudson Terminal Bldg., 30 Church St.
KANSAS CITY, MO.—R. A. Long Bldg.

Products

Exclusively Manufacturers of Light Steel Rails and Accessories—Splice Bars, Bolts, Nuts, Spikes, Frogs and Switches.

Two things are especially essential to users of Light Steel Rails:

QUALITY AND QUICK DELIVERY.

BUCKEYE RAILS are the STANDARD FOR QUALITY, and have been all the years we have been in business.

QUICK DELIVERY is our specialty, whether you want one ton or one hundred.

Special lengths furnished if desired.

Let Us Have Your Next Order

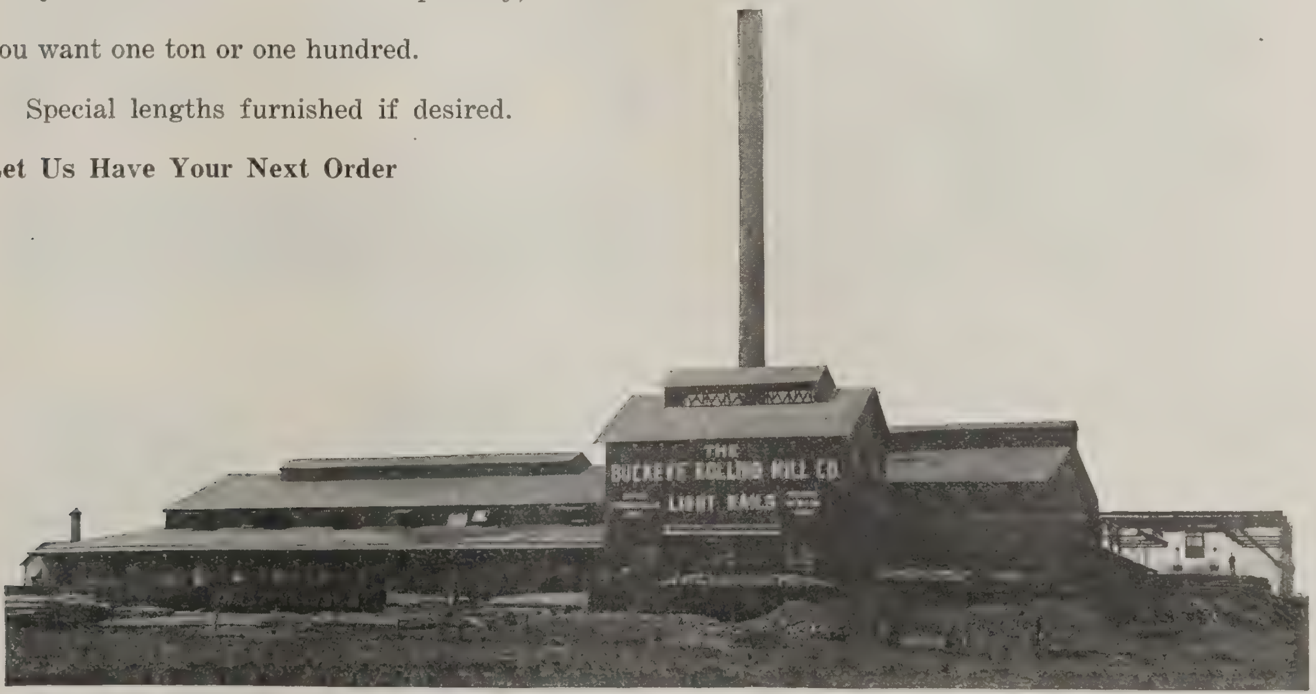
WAR PRICES MAY
BE TEMPTING, BUT
THERE IS GREATER
SATISFACTION
FILLING THE ORDERS
OF THOSE UPON
WHOM WE DEPEND
FOR BUSINESS IN
NORMAL TIMES.

No War Orders For Us

Inspection

Our products are all carefully inspected, as made, at our mills, and not on paper.

We want you to look them over, at your end of the line. That's the inspection that counts, after all. Our guarantee does the rest.



The Best Equipped Light Steel Rail Mill in the Country.

SWEET'S STEEL COMPANY

Mills and General Offices
WILLIAMSPORT. PA.
Branch Offices
PHILADELPHIA, Land Title Building NEW YORK, 2 Rector St.
Manufacturers of

Steel Rails and Appurtenances

Products.

Light Steel Tee Rails and Attaching Clips; Steel Ties; Light Steel Angles; Light Steel Flats and Bands; Steel Concrete Reinforcement Bars.

Facilities.

A large plant, equipped with modern machinery, and possessing very favorable and advantageous shipping facilities, warrants prompt and quick delivery of the material.

Light Steel Rails and Fastenings.

SWEET'S STEEL COMPANY, the largest independent manufacturers of light section tee rails in the United States, make these rails (standard A. S. C. E. sections) from high-grade stock of new first quality, the same being required to pass severe chemical and physical tests necessary to insure a thoroughly satisfactory rail section. Under Sweet's construction, a uniform product, made from steel suitable for hard usage, is secured, without flaws or defects due to segregation of various metal compositions (Fig. 1).

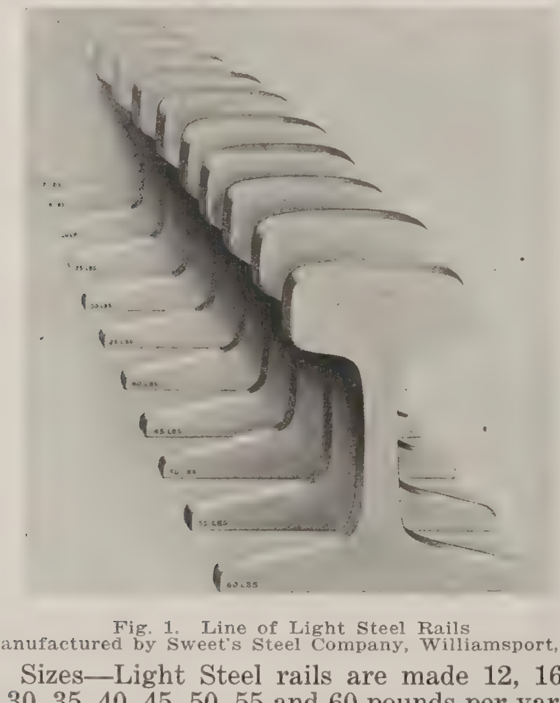


Fig. 1. Line of Light Steel Rails
Manufactured by Sweet's Steel Company, Williamsport, Pa.

Sizes—Light Steel rails are made 12, 16, 20, 25, 30, 35, 40, 45, 50, 55 and 60 pounds per yard.

Lengths—Steel rails are furnished in regular standard lengths with splice bar drilling, and rolled in accordance with specifications as set forth by the American Society of Civil Engineers. Rails in any special length, such as all 15, 20, or 24 feet, also supplied.

Splice Bars—Made complete with bolts and nuts for 12, 16, 20, 25, 30, 35 and 40 pound rails.

Angle Bars—Made complete with bolts and nuts for 30, 35, 40, 45, 50, 55 and 60 pound rails. also supplied. Bond drilling furnished when required.

Line Drawings—Complete specifications with full sets of line drawings of rails and splice bars made by SWEET'S STEEL COMPANY, in all sections as shown in Fig. 1, will be forwarded on request. Such drawings are accompanied with complete information regarding weights, sizes, dimensions and punching of rails; punching and weight of splice bars, per pair; weight of bolts per joint; sizes of steel spikes and bolts, etc.

Steel Ties and Fastenings.

For portable, industrial or mine track, in place of wood ties. Recommended for 12, 16, 20, 25, 30, 35, 40, and 45 pound rails. Tie spacing, about 15 ties to the 30-foot rail. Life of steel ties, laid in ballast, is about twenty years and is indefinitely prolonged by immersing ties (when heated to 500 degrees Fahr.) in hot coal tar (Fig. 2).

Corrugated Feature—These steel ties have a double corrugation running their entire length which, combined with the high carbon steel from which they are rolled, gives them much greater rigidity than any other similar section on the market, while at the same time the possibility of buckling is reduced to a minimum.

Cost Comparison with Wood Ties—The best wood tie, with the plates and spikes complete, originally costs $1.35, and its life is seven to ten years only.

Sweet's steel tie costs originally 27 cents each, complete with 4 clips, 4 bolts and nuts, and they last an indefinite period.

Cost of ties laid down at two foot centers for one room (in mines), 280 feet long, may be stated briefly thus:

140 wood ties, laid down at 2-foot centers at $1.35 each	$189.00
Maintenance cost, at $14.00 per year	
140 Sweet's steel ties, laid down at 2-foot centers, at 27 cents each	37.80
Maintenance cost, at $4.50 per year	
Original cost in favor Sweet's steel ties	$151.20

Clips and Tee Head Bolts—These fastenings constitute the German idea which has stood the test satisfactorily during many years. Clips and tee head bolts are placed opposite each other—a distinct mechanical advantage. (Fig. 6).

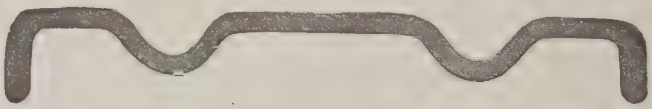


Fig. 2. Steel tie, section No. 5, reduced size, cross-section.

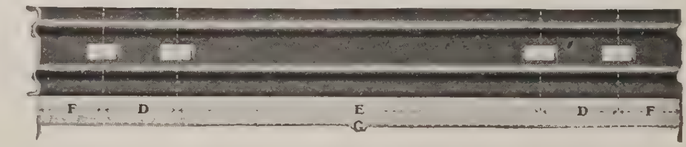


Fig. 3. Steel tie, section No. 5, rolled to a weight of 3½ to 5 lbs. per foot. This tie is particularly recommended for the full range of light steel rails.

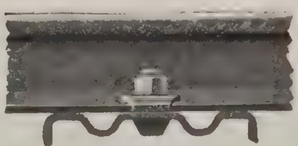


Fig 4. Cross-section of tie and end view of clip.

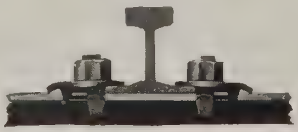


Fig. 5. Cross-section showing clips attached to rail and tie.

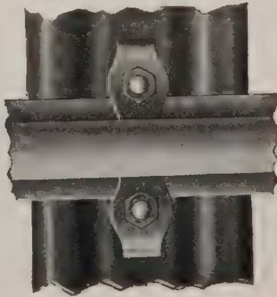


Fig. 6. Top view showing clips attached to rail and tie.

UNITED STATES RAIL COMPANY

Main Office and Rolling Mills

CUMBERLAND, MD.

Largest Independent Manufacturers of

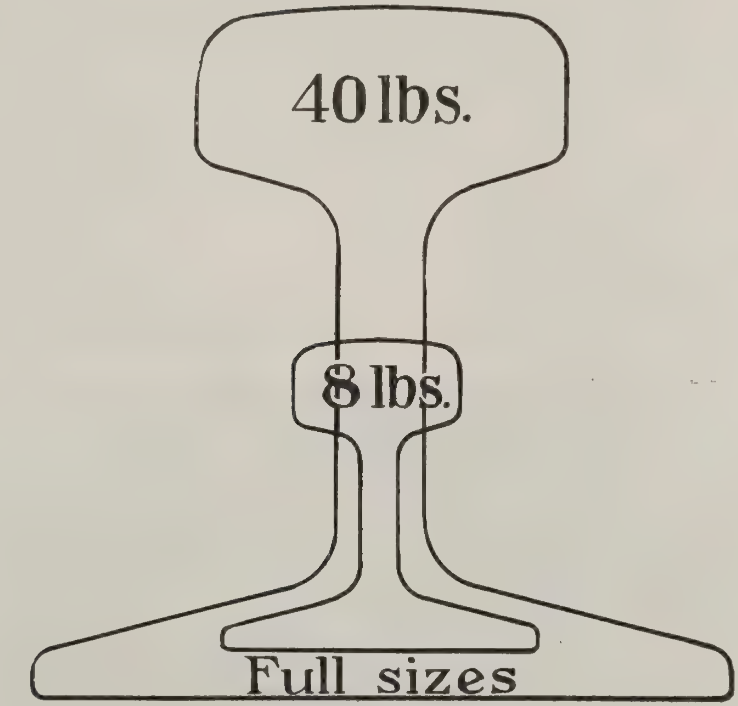
Standard A. S. C. E. Section

LIGHT STEEL RAILS

HENRY SHRIVER, President.
H. E. WEBER, First Vice-President.

W. M. ROBERTS, JR., Second Vice-President.
T. F. SHANNON, Secretary-Treasurer.

Plain and Angle
Splice Bars.



Bolts and Spikes.
Frogs and Switches.

8, 12, 16, 20, 25, 30, 35, and 40 lbs. per yard.

All rails rolled by us are inspected by Hildreth & Co., Inspecting Engineers of New York City, whose inspectors are stationed at our plant, at Cumberland, Md., in the interest of customers.

WE CAN FURNISH RAILS CUT TO SPECIAL LENGTHS FOR ALL PURPOSES.

RELAYING RAILS 56 TO 100 LBS. PER YARD.

WRITE FOR PRICES. **IMMEDIATE SHIPMENT.** **ANY QUANTITY.**

THE WEST VIRGINIA RAIL CO.

Mills and General Office: Huntington, W. Va.

Manufacturers of

Light Steel Rails, Joints and Spikes.

and Dealers in

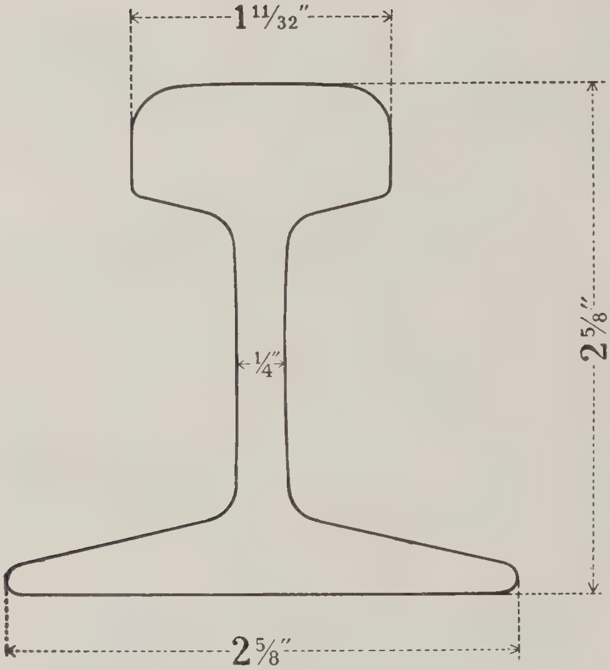
Relaying Rails All Sizes

We manufacture rails from 12 to 45 lbs. inclusive. For the past nine years we have devoted our entire attention exclusively to making good first quality light rails. We are rail experts and you will find our satisfied customers in every mining state in the Union. Wherever there are mines you find the name of West Virginia Rail Company stands for quality and integrity.

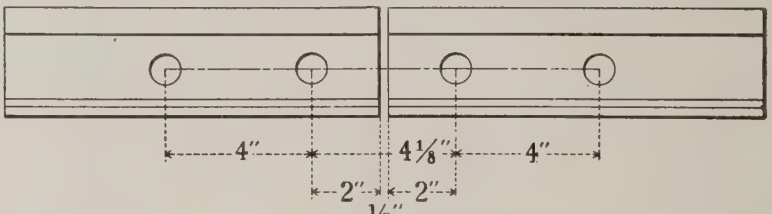
We carry a large stock of rails as well as splices, bolts and spikes on hand and can give prompt shipment at all times.

Send for our Bulletin which gives you valuable rail data, including rail dimensions, number of spikes in keg, number of cross ties required per mile, number of tons required per mile of track of various size rail; also comparative table giving price equivalent in gross ton, net ton and cwt.

"All our rails are A. S. C. E. Section."

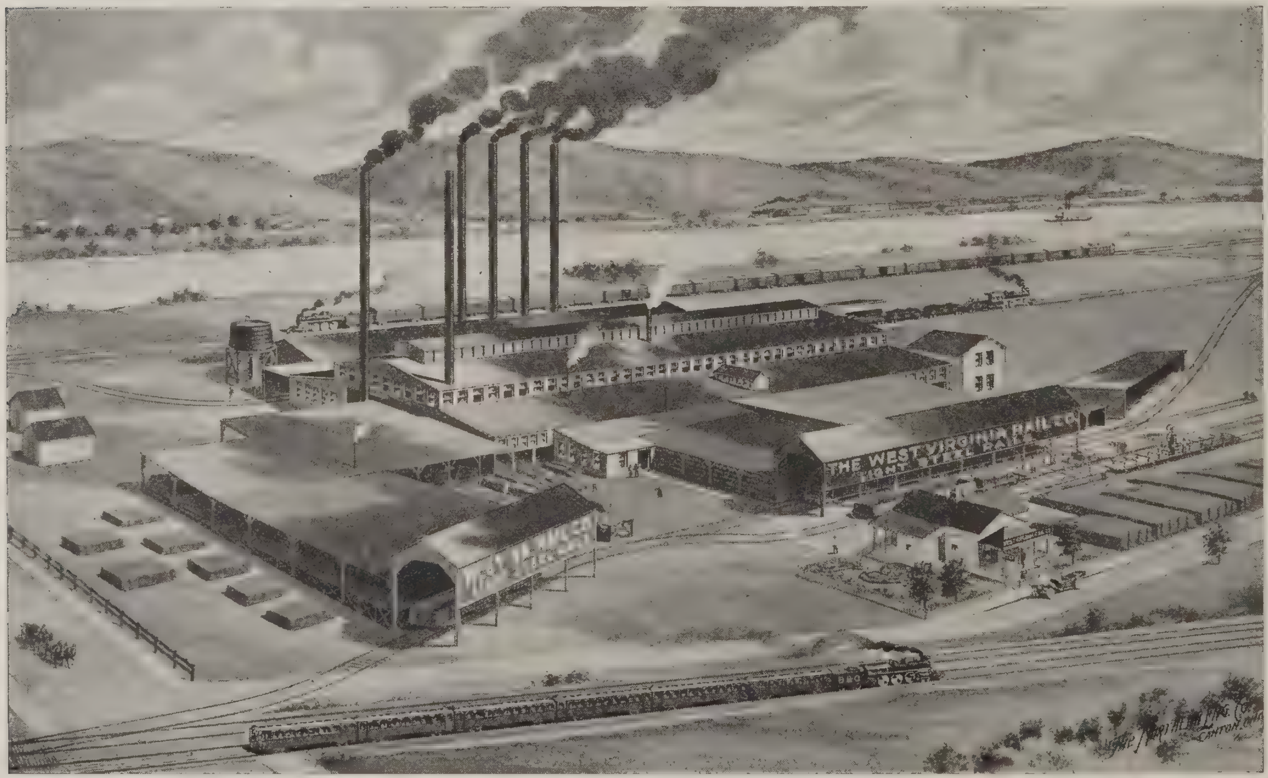


20 Lbs. per Yard
31.43 Gross Tons per Mile of Single Track
168 Feet of Single Track per Gross Ton.



Center of Web
Diameter of Holes 5/8 Inch.

We are also dealers in Relaying Rails, all sizes.


THE WEST VIRGINIA RAIL CO.

L. B. FOSTER COMPANY

PITTSBURGH, PA.

Rails--New and Relaying, Second-Hand Pipe and Equipment

Relaying Rails

500 tons 90 lb. with Angle Fish Plates.
2500 tons 85 lb. “ “ “ “
2000 tons 70 lb. “ “ “ “
500 tons 67 lb. “ “ “ “
300 tons 65 lb. “ “ “ “
2000 tons 60 lb. “ “ “ “
1500 tons 56 lb. “ “ “ “
150 tons 50 lb. “ “ “ “

300 tons 45 lb. with angle and Fish Plates.
500 tons 40 lb. “ “ “ “
200 tons 40 lb. “ Plain “ “
700 tons 35 lb. “ Angle “ “
200 tons 30 lb. “ “ “ “
200 tons 30 lb. “ Plain “ “
200 tons 25 lb. “ Angle “ “
200 tons 25 lb. “ Plain “ “

Rails Cut to Lengths for Special Purposes

All Relaying Rails average 30 ft. in length, uniform in section, height and drilling, straight, free from surface bends, breaks, kinks or splits and show very little wear. Inspection during loading or subject to inspection and approval at destination point. Quick shipment guaranteed.

New Rails

200 tons 8 lb. per yard.
300 tons 12 lb. “ “
500 tons 16 lb. “ “
300 tons 20 lb. “ “
With complete Plain Splices.

500 tons 25 lb. per yard.
500 tons 30 lb. “ “
500 tons 35 lb. “ “
500 tons 40 lb. “ “
With complete Angle or Plain Splices.

New Rails available for quick shipment in carload or less carload lots, at MANUFACTURERS' PRICES. Can drill for bonding or cut to special lengths.

Rail Splices—(New and Second-Hand.)

For years we have made a specialty of supplying Splice Bars, Angle and Plain, in any quantity, guaranteed to fit all sections no matter how old or how modern the Rail. We have the patterns for all drillings and sections, sizes 8 lbs. to 125 lbs. Can furnish with or without Bolts. To secure accurate fit send by express collect, a sample of bar or template.

We make Combination Splices to connect Rail sections of different height and drilling.

Second Hand Pipe.

All sizes from $\frac{1}{4}$ in. to 24 in. for Steam, Water, Gas and Oil Lines. Can save you 30% to 50% on Second-hand Pipe and guarantee materials to give service equal to that of New Shipments subject to inspection and approval at destination point. New Pipe at Manufacturers' prices.

Frogs and Switches—(New and Second-Hand.)

All kinds of Regular and Industrial Track work for Steam and Electric Railroads, Mines, Contractors, Quarries and Logging Railroads. Portable Track.

Track Accessories

Bolts, Nuts
Spikes
Tie Plates
Rail Braces
Car Movers
Rail Benders
Rail Forks
Rail Tongs
Drills and Saws

Second-Hand Equipment

Locomotives
Cars
Boilers
Engines
Pumps
Compressors
Hoisting Engines
Electric Machines
Tools
Steam Shovels
Derricks
Orange Peel or Clam Shell Buckets.

M. K. FRANK

Frick Bldg. Pittsburgh, Pa.

Storage Yards:

CRESSON, PA. PITTSBURGH, PA. WILLIAMSPORT, PA.
HUNTINGTON, W. VA. CUMBERLAND, MD.

New and Relaying Rails, Mine Cars and Mining Equipment

Every reader will appreciate the great convenience, saying nothing of loss of time, which means money, in being able to receive **prompt shipment** on material, and in this light we wish to place ourselves before the coal operators as having in stock at all times large quantities of New and Relaying Rails, Spikes, Bolts and Nuts, Splice and Angle Bars, Frogs and Switches, Turn-Tables, Portable Track, and all gauges of new and second-hand mine cars.

RAILS

The large tonnages at our centrally located warehouses makes no order too large for us to handle or too small to receive our careful and immediate attention. We are equipped for cutting rail for use as buck staves, in the building of coke ovens, furnaces and other general uses where rail is more serviceable and more economical than I beams. We also have facilities for straightening rail.

SPLICE AND ANGLE BARS, SPIKES, ETC.

We make a specialty of supplying mine spikes, bolts and nuts, splice and angle bars for all section rail, and splice bars made to fit odd or any sections.

FROGS AND SWITCHES

We are in position to furnish complete track equipment, and we always have in stock, for prompt shipment, large quantities of new and relaying outfits. We also control the output of the Hitchcock patent cast steel frog and will be pleased to send you catalogue upon request.

SCRAP IRON AND COPPER AND SECOND-HAND MACHINERY

If you have any scrap to dispose of at your plant and want any rail or equipment, advise us giving description of same, and we will make an exchange trade with you, giving you what you need for scrap and second-hand machinery.

Our complete stocks permit us to compete with all concerns handling our line, and on this basis we respectfully solicit your business and inquiries.

L. A. GREEN

Offices, First National Bank Building
PITTSBURGH, PA.

New and Used Rails and Machinery
Specialists in Mine Equipment

Rails

New and Relaying
Light and Heavy Sections.
Rails Cut to Length

One of our principal specialties for the past fifteen years has been new and relaying rails from 12 to 100 pound sections. We are in position to furnish almost any quantity of first-class relayers, subject to the most rigid inspection.

Due to the large tonnage of relaying rails we have sold we are in better position to judge quality than the average inspection bureau. We make no extra charge.

Switch and Frogs

Carried in Stock
Special Material
Built to Specification

Large numbers of coal companies have used our services, without cost, for the laying out, (on an economical basis), their yards, tipple and room turnouts.

Accessories

Splice Bars
Spikes, Bolts and Nuts
Track Tools

We manage to have for quick shipment at all times, splice bars for standard and odd section rails, punched for any drilling. Send an impression of the rail or a sample bar at our expense.

Machinery.

New and Second-Hand
Engines, Boilers
Pumps, Compressors
Electric Mining Machinery
and Locomotives
Motors, Dynamos
Iron and Woodworking
Machinery

Due to our large list of available machinery and equipment from the smallest article to the most up-to-date and expensive machinery, we are used as an exchange bureau. We may have in stock or on our list the very thing you so urgently desire, or a market for the machinery you wish to dispose of.

We only handle good usable equipment.

Contractors' Equipment

New and Second-Hand
Locomotive and Cars
Steam Shovels
Road Rollers
Stone Chushers
Concrete Mixers
Hoisting Machinery
Derricks, Buckets
Carts, Wagons, Etc.

In addition to the supplying of rails, machinery and equipment for the operating mine, we furnish equipment for the building of coal and coke plants from the sinking of the shaft to the complete equipping of the operating mine.

Pipe

New and Second-Hand

Supplies

For Mills, Mines and
Contractors

While we do not handle a complete line of supplies, we specialize on items that are most needed at the mine. The high grade and attractive prices are due to our volume of business in the specialties.

We offer you a service that is conscientious, effective and to your profit.

THE M. E. LAZARUS CO.

976-978 Rockefeller Building
Cleveland, Ohio

Buyers of Scrap Iron & Metals

Scrap Iron

For the past eighteen years, we have been making a specialty of buying scrap from coal mines. Some coal mines prefer selling their scrap, just as it runs, others prefer to sell it sorted. We buy either way. We buy coal mine scrap, just as it runs, and we take everything in the line of scrap iron, with the exception of whole boilers, turnings, borings, sheet iron, and cable. These items we exclude. We buy nothing but No. 1 coal mine scrap in this instance. We also buy mine car wheels, if loaded separately from the other materials, as well as mine axles, if loaded separately from other materials.

Metals

We make a specialty of buying copper, brass, lead, babbit, and drosses, in fact anything in the metal line that is accumulated around a coal mine. Write us at any time, whenever you have any metals for sale, whether it be a small lot, or a large one. We buy metals in lots from a barrel upwards. Our terms are spot cash, either sight draft against Bill of Lading, or New York draft, upon presentation of invoice.

We pay the best of prices.

Rails

We sell rails for relaying purposes. Let us know your wants, whether it is a five ton lot, or a carload lot. We also sell rails cut to sizes, for building purposes.

Best of references from coal mines.

Pipes

We sell or buy new and second hand pipe. Write us and give your wants.

Machinery

We sell or buy:

- New and Second-hand Engines,
- Boilers,
- Pumps,
- Compressors,
- Electric Mining Machinery and Locomotives,
- Motors,
- Dynamos,
- Iron and Woodworking Machinery.

Write Us for Prices Before Selling.

RICHARDSON & CO., INC.

1103 Bessemer Building
PITTSBURGH, PA.

Cut Rails

- RELAYING RAILS
- NEW RAILS
- SPLICE BARS
- BOLTS
- SPIKES
- RAIL BRACES
- TIE PLATES
- FROGS & SWITCHES

We keep on hand standard sections second-hand Steel Rails to be cut in pieces of any length that may be ordered, for grate bars, furnace bottoms, supporters of water, gas and steam pipes, roof girders, posts and binders, and other uses too numerous to mention, that your wants will from time to time suggest. The use of these rails will save you 50%.

The Cincinnati Frog & Switch Company

General Office and Works CINCINNATI, OHIO

—Manufacturers of—

Track Equipment

for Steam and Electric Railroads, Mines and Mills

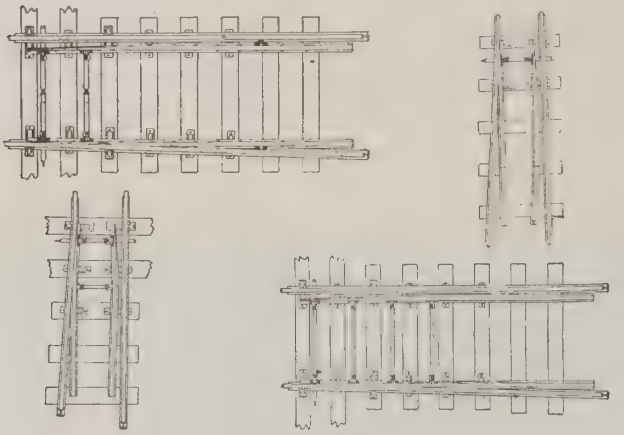
Products

Frogs, Crossings, Crossovers, Switches, Switch Stands, Guard Rails, Guard Rail Clamps, Rail Braces, Tipple Tracks, Tie Plates, Mine Turnouts, Portable Track, Steel Ties, Special Track work and Layouts of every description.

Specialty

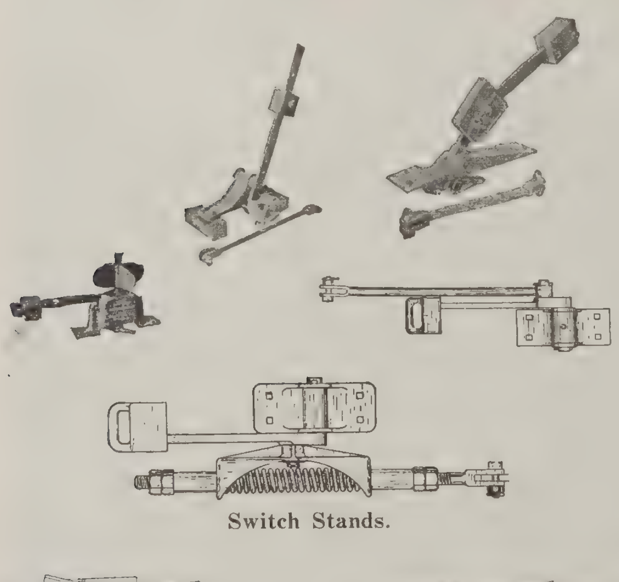
We specialize in Track Equipment for Coal Mines, standard or special layouts.

Our corps of expert engineers will solve your transportation problems. We make no charge for consulting engineering. Tell us your track troubles.

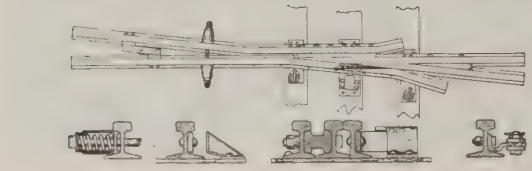


Split Switches.

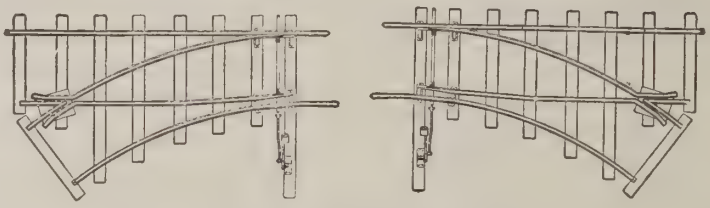
We make over thirty-five types of switches.



Switch Stands.



Stiff and Spring Frogs. Various types.



Curved Room - Turnouts.

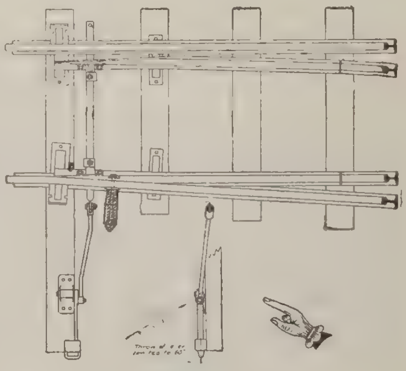
We have shipped thousands of these Curved Room Turnouts to mines and recommend their use on short radius curves.

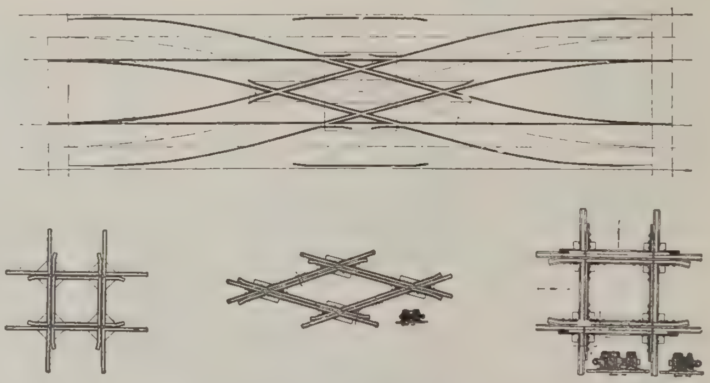
Please notice that the Frog Arms are made long enough to abut the Switch, thus eliminating the short filling rails, also saving two pair of fishplates per turnout.

Safety Spring Switch for Room Turnouts

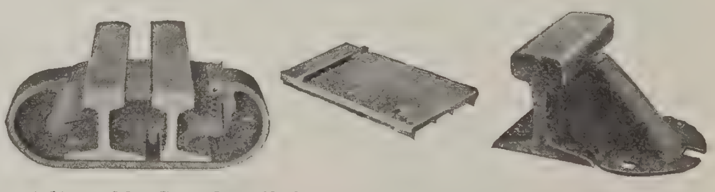
Main track always open.

Eliminates danger of wrecks at switches.





Crossings and Crossovers.



Adjustable Guard Rail Clamps, Tie Plates, and Rail Braces.

Deliveries and Facilities

Our plant is equipped with modern machinery and appliances; our workmen are experts. We carry an immense stock of raw material, and have excellent shipping facilities. Therefore, can furnish on short notice anything in the line of Track Equipment, either standard or special.

Ask for copy of our Catalog.

CLINTON SWITCH COMPANY

CLINTON, IND.

Manufacturers of

Clinton Latches and Para-lock Switch Throws

Products

We manufacture THE CLINTON LATCH to fit any weight rail from 16 pounds to 40 pounds, A.S.C.E. standard, in the following lengths:

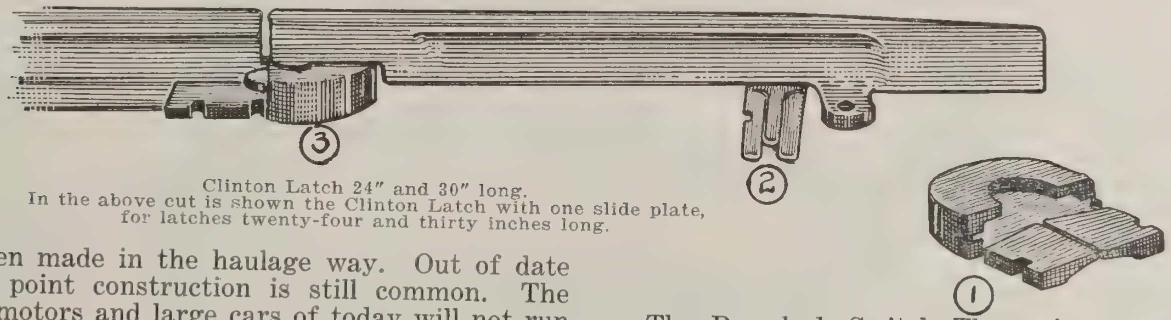
16-pound, 24 inches long; 20-pound, 24 inches, 30 inches and 36 inches long; 25-pound, 30 inches, 36 inches and 42 inches long; 30-pound, 30 inches, 36 inches and 42 inches long; 35-pound, 36 inches, 42 inches and 48 inches long; 40 pound, 42 inches, 48 inches and 60 inches long. Other sizes made to order on special quotations.

The CLINTON LATCH is packed in sets, each consisting of one right-hand point, one left-hand point, two base-plates and two to four side-plates, according to length of latch. We do not include bridle-bars, which are usually made from scrap bars, to suit track gauge.

The Clinton Latch (Patented)

To keep a modern mining operation up to its full capacity, every unit of the system must be as nearly perfect as possible in order to maintain the proper ratio between cost and tonnage. In order to produce the results expected of the mines of today, you have developed electric and gasoline locomotives, large pit-cars, automatic caging devices, coal cutting machines and other devices to increase tonnage or lower costs.

What about the tracks and switches? With the exception of heavier rail, little improvement has been made in the haulage way. Out of date switch point construction is still common. The heavy motors and large cars of today will not run right over the switches of yesterday.



Clinton Latch 24" and 30" long.
In the above cut is shown the Clinton Latch with one slide plate, for latches twenty-four and thirty inches long.

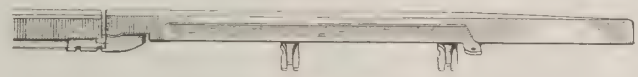
Rivets, bolts, strap iron or fish plates are not used in attaching The Clinton Latch to the switch rails. Thus we have eliminated the chief cause of latch trouble.

The flat, rounded base, or pivot lug on the butt-end of the latch, fits into and interlocks with the base-plate. The base-plate is undercut on the bottom to fit over the base of standard rail and slotted to receive the web. The base-plate has four spike notches for spiking to tie. This method of construction allows all necessary motion of the switch-points, but makes imperfect alignment impossible. The only chance for this latch to turn over is for the rail to turn with it. The slide-plate which is also notched for spikes, furnishes a good bearing for the point-end of latch.

In laying these latches the slide-plate should be placed inside of and close to the bridle lug of latch and not at the point. This gives a broader support for latch at the point where weight of car or motor actually falls on latch. The tire of wheel, being at least three inches in width, is supported by adjacent rail till well past the bridle lug.

The Para-Lock Switch Throw (Patented)

It throws parallel with the track and locks itself automatically at either extreme of lever movement, yet may be used as an automatic switch to outgoing motors when lever stands at middle positions. The safest switch throw made. Danger to motormen and switchers is reduced to a minimum by its use. Semaphore may be attached when desired.

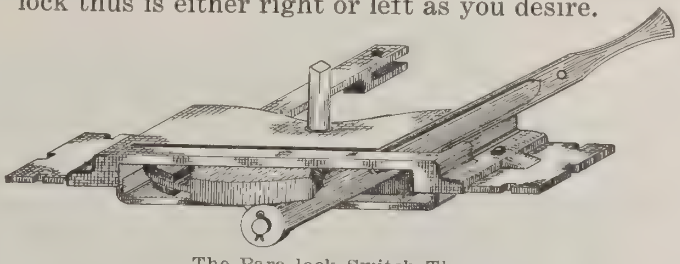


Clinton Latch 36" and longer.
Note the extra slide plate, so designed as to take care of both downward and lateral stresses.

It sets low and its pull is in direct line with bridle bar, while the throw itself is less liable to be damaged by derailed cars, etc., should such a thing occur. This last point, however, is not liable to be proven because a switch equipped with Clinton Latches and Para-lock Switch Throws stands little chance to cause a derailment.

We use the best malleable iron in our switch throws and they will stand all kinds of abuse.

The Para-lock Switch Throw is reversible by taking off top and inverting one part. Every Para-lock thus is either right or left as you desire.



The Para-lock Switch Throw.

If the cut does not show enough to convince you, let us send one on approval. The price is right.

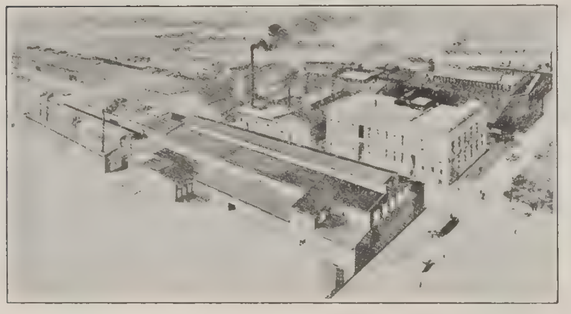
We are willing and anxious to allow you to try either The Clinton Latches or Para-lock Switch Throw for a long enough time to prove their value. In ordering latches sent on trial, specify length of latch and weight of rail used.

ELLIOT FROG & SWITCH CO.

EAST ST. LOUIS, ILL. PUEBLO, COLO.

Manufacturers of

Frogs, Switches, Crossings and General Track Work
Special Work for Mines and Smelters

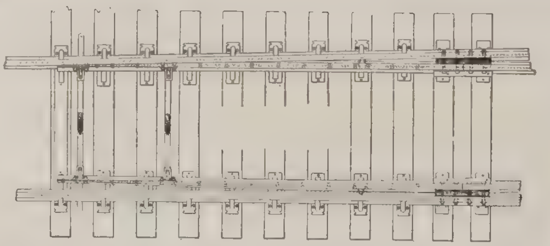


East St. Louis, Illinois Plant.

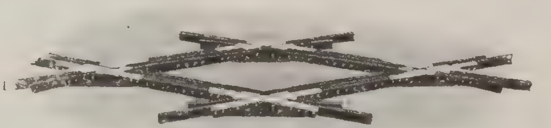
Pueblo, Colorado Plant.

FROGS
SWITCHES
CROSSINGS

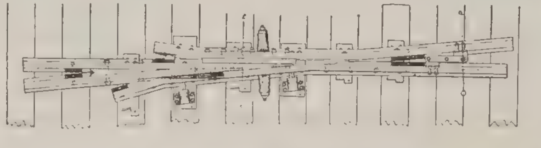
FOR STEAM AND
ELECTRIC
RAILWAYS



ELLIOT FROG & SWITCH CO.

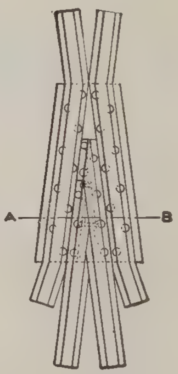


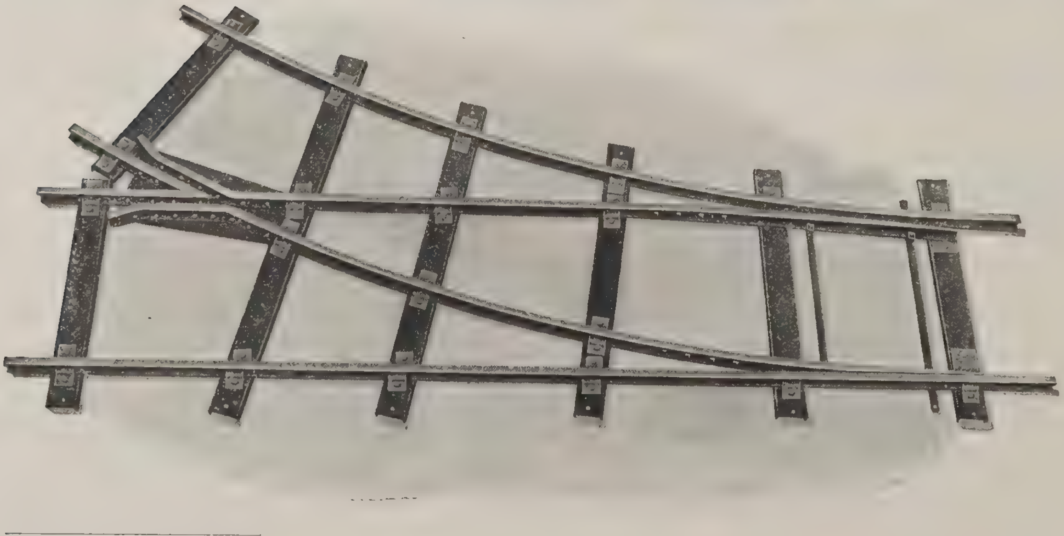
E. ST LOUIS, ILL — AND — *PUEBLO, COLO.*

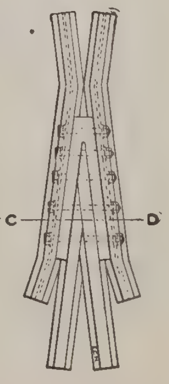


SWITCH STANDS
GUARD RAILS
CLAMPS

MANGANESE
CASTINGS







THE INDIANAPOLIS SWITCH & FROG CO.

General Offices and Works, SPRINGFIELD, O.

SALES OFFICES:—NEW YORK, CHICAGO, PORTLAND, ORE., LOS ANGELES, SAN FRANCISCO,
KANSAS CITY, SPOKANE, SEATTLE.

Products.

Frogs, Switches, Crossings, Stands, Rail Braces and all track accessories for Rails from 8 to 100 lbs. per yard.

Service.

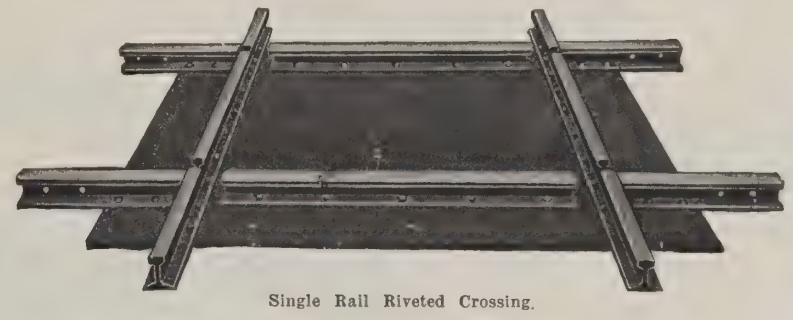
We design your layouts and make no charge for consulting engineering. Our facilities for making prompt shipments are of the best.

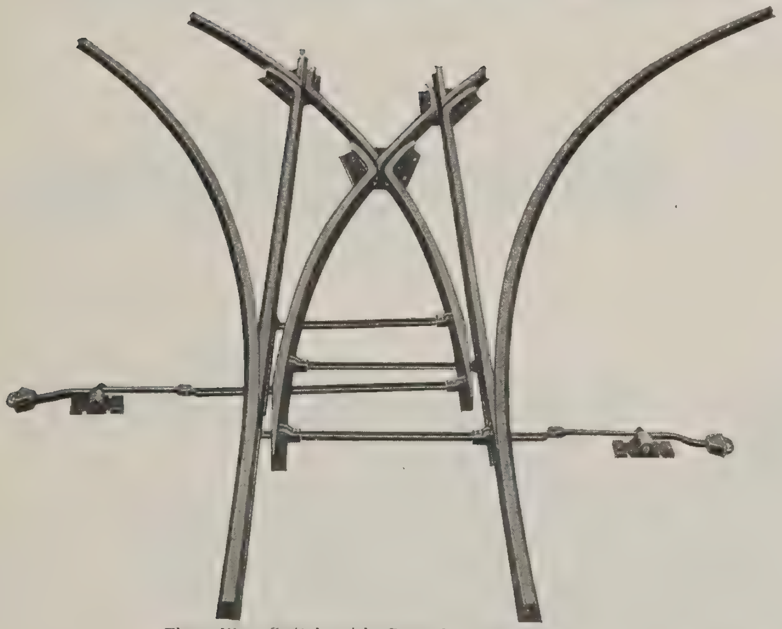
Quality Counts.

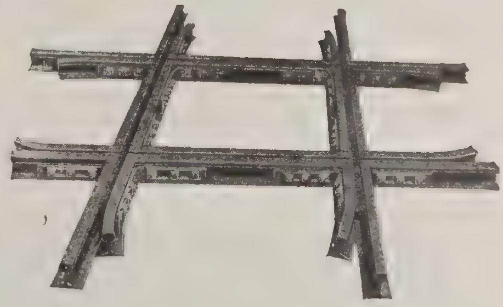
Cheap track layouts are false economy. Layouts scientifically and correctly designed and of the best material and workmanship last longer, save motive power, prevent derailments, breakdowns, damage and delay, and require less for up-keep.

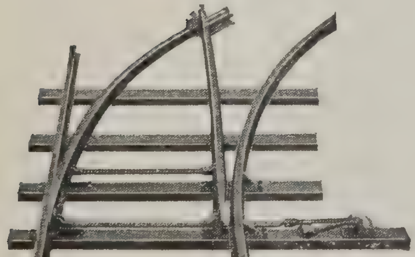
Catalogue.

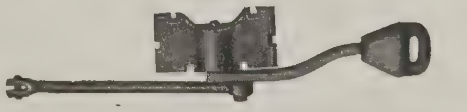
We have a large bound catalogue showing detailed descriptions of our product which will be sent upon application.

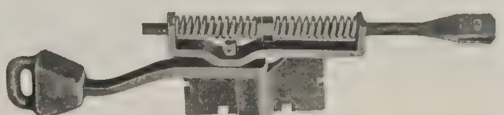

Single Rail Riveted Crossing.

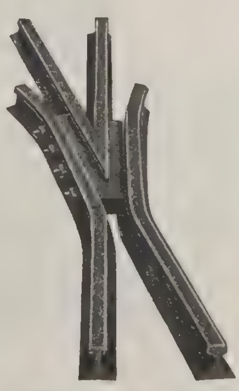

Three-Way Switch with Ground Throw Stand.


Bolted and Filled Crossing.


Combination Switch and Frog for Short Radius with Ground Throw Stand.


Plain Ground Throw Stand.


Spring Ground Throw Stand.


Rigid Bolted and Cast Filled Frog.

KILBY FROG & SWITCH COMPANY

BIRMINGHAM, ALABAMA

Manufacturers of

Railroad Crossings, Frogs and Switches, Etc., for Steam, Electric and Industrial Railways

Frogs.

We manufacture frogs of any description including Spring, Pivoted tongue, Riveted plate, Steel or Cast filled bolted, Manganese Insert and Solid Manganese frogs.

Switches.

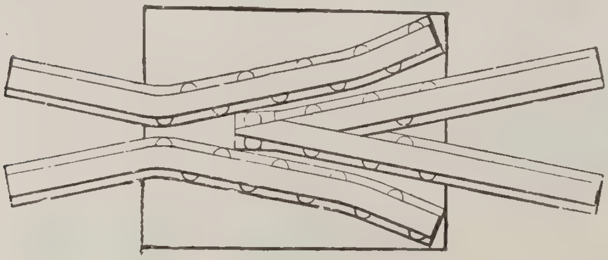
Of any desired type — plain or reinforced Switches, Curved Turnouts with frog arms connecting with the Switch, Room Switches and portable track of all kinds.

Switch Stands.

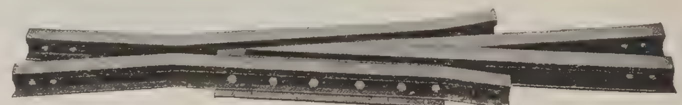
Low and high target Stands, Ground throws for light or heavy switches.

Crossings.

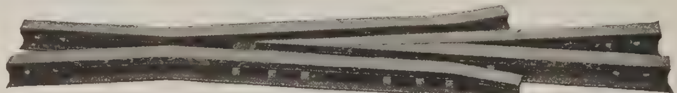
Of Single rail, two rail or three rail type — with or without riveted plates, Ordinary rail construction, also Manganese Insert and Solid Manganese Crossings.



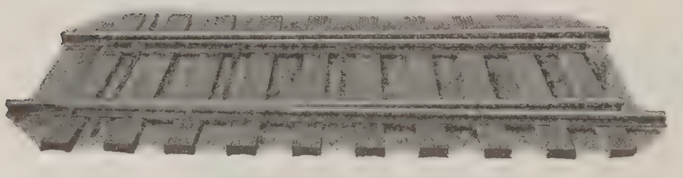
Design No. 54.
Light "T" Rail frogs on riveted plate.



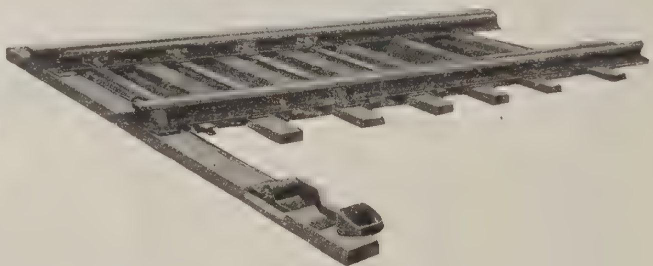
Design No. 55.
Rigid Steel filled frog.
Can be furnished with or without plate.



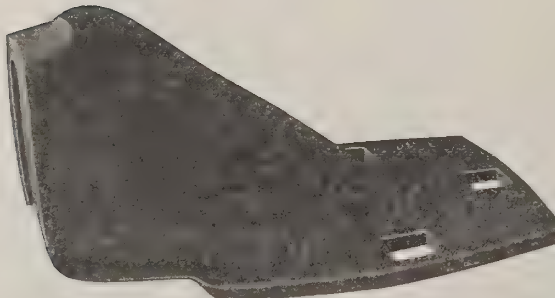
Design No. 76.
Rigid Cast filled frog with or without plate.



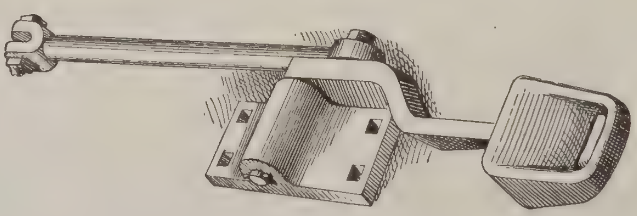
Design No. 133.
Standard Split Switches.



Design No. 102.
Split switch with Spring Ground Throw.



Design No. 202.
Pressed Steel Rail Braces.



Design No. 180.
Ground Throw for heavy switches. These are also made in a lighter design for light switches.

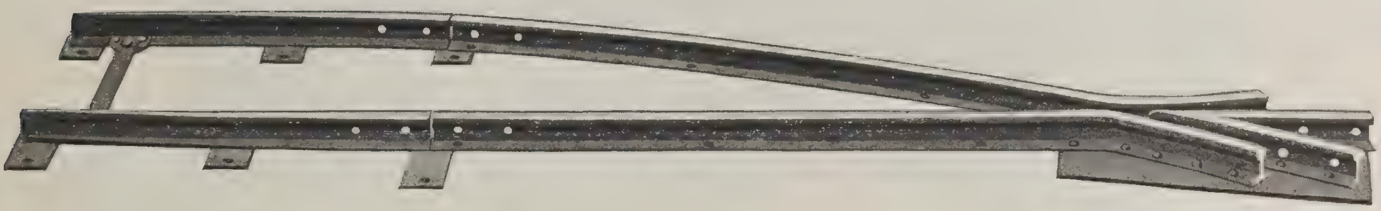
LIGHT RAILWAY EQUIPMENT CO.

General Offices
Commercial Trust Bldg.
PHILADELPHIA, PA.

Works,
Chester, Pa.

Branch Office,
1116 House Bldg., Pittsburgh, Pa.

Manufacturers, Engineers and Contractors



Products

Portable Railways; Narrow Gauge Railways; Industrial Electric Railways; Cable Railways; Electric Locomotives, Over Head Wire, Third Rail, Storage Battery.

Switches; Frogs; Crossings; Ground Throws; Rails; Rail Joints; Spikes; Track Bolts; Turntables; Cars, Etc.

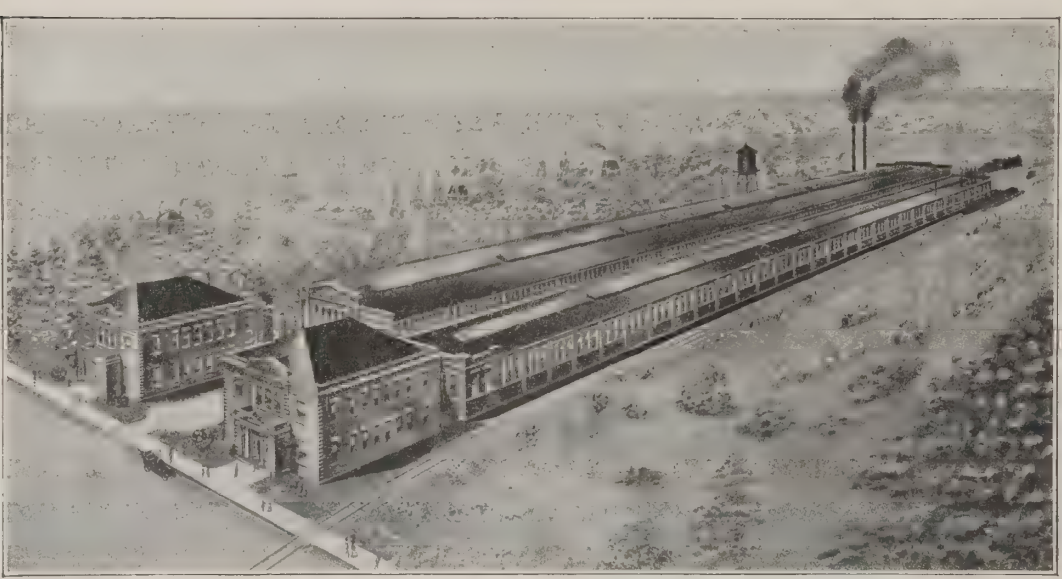
Track material drilled and supplied with bonds when desired.

Established 1882

WEIR FROG COMPANY

CINCINNATI, OHIO

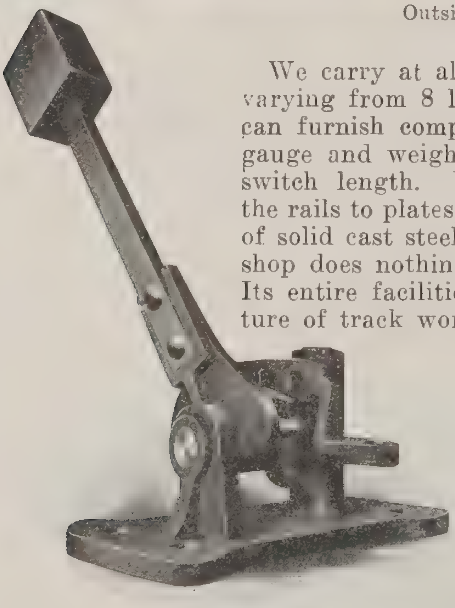
Manufacturers of Frogs, Switches, Crossings Stands, Braces, Etc.



OUR SHOP MADE TRACK WORK IS MORE DURABLE AND CHEAPER IN THE LONG RUN THAN YOUR BLACKSMITH MADE FROGS AND SWITCHES GOOD FIT GUARANTEED.

Outside View of Shop Located at East Norwood, Ohio

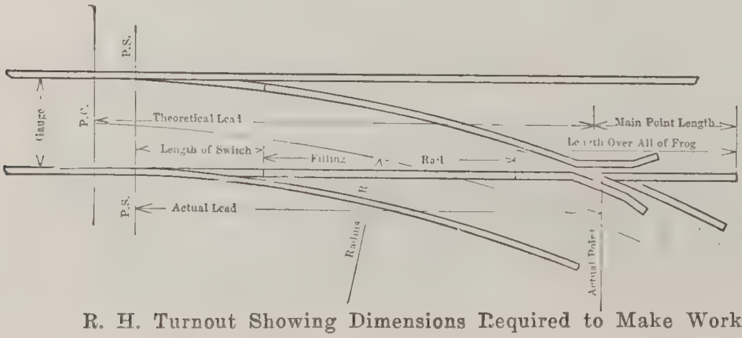
We carry at all times a stock of light rails varying from 8 lbs. to 40 lbs. and over. We can furnish complete turnouts of any radius, gauge and weight of rail; any frog angle or switch length. We make frogs by riveting the rails to plates, by bolting the rails together, of solid cast steel or of manganese steel. Our shop does nothing but frog and switch work. Its entire facilities are given to the manufacture of track work.



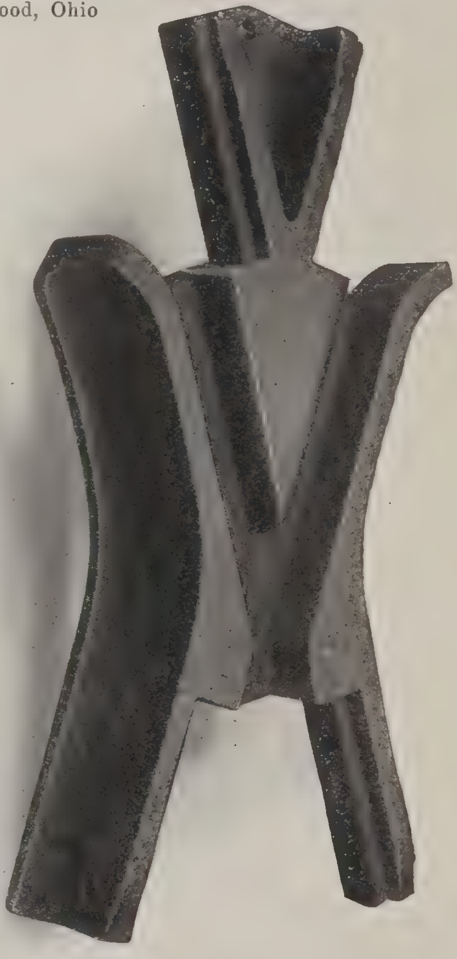
Malleable Iron Ground Throw—Throws Parallel to Track

This frog made without plates or rivets. It is made to fit angle and rails.

Low priced and durable.



R. H. Turnout Showing Dimensions Required to Make Work



Solid Cast Steel Frog

WRITE FOR CATALOGUE "C" GIVING TABLE OF TURNOUTS.

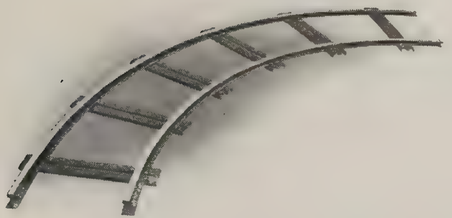
WILLIAM WHARTON JR. & CO., Incorp.

EASTON, PENNA.

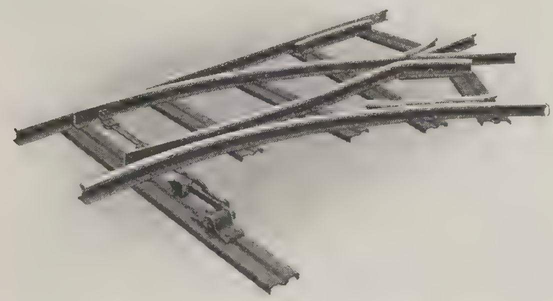
Manufacturers of

Switches, Frogs, Crossings, Etc. for Tracks in Mines, Mills and all kinds of Railways
Also Mine Car Wheels
TISCO Manganese Steel for Hard Service

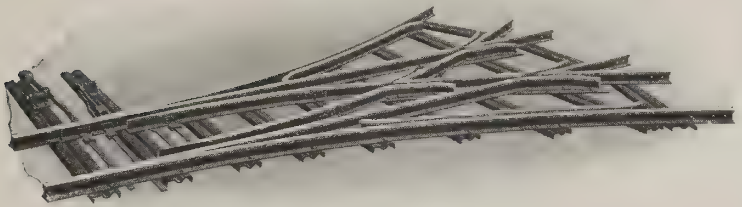
PORTABLE



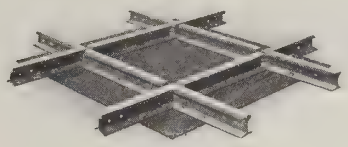
Portable Curved Section of Track.
We also furnish straight sections.



Portable Switch, with Throwing Lever.

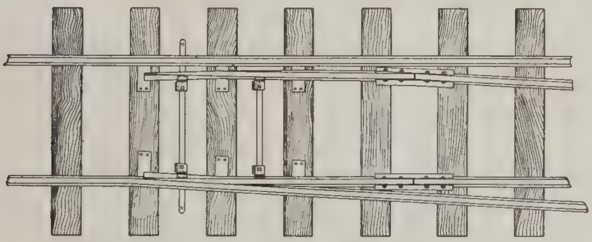


Portable Three-Way Switch, with Throwing Levers.

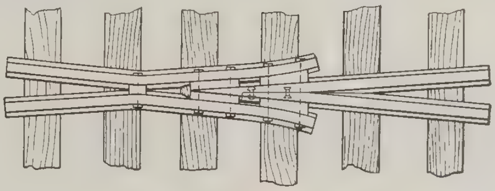


Portable Crossing.

FOR PERMANENT INSTALLATION

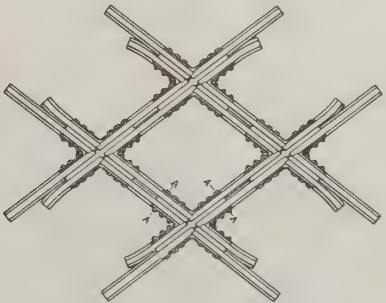


Split Switch, with Two Rods.



Filled and Bolted Frog.

Riveted Plate Frog.



Filled and Bolted Crossing. Two-Rail Style.

Ground Throw for Use With Either of the
Above Styles of Construction.

FAIRMONT MINING MACHINERY CO.

Regular Equipment.

- Tipple Structures
- Screens and Chutes
- Loading Booms
- Picking Tables
- Conveyors—all types
- Cable Car Hauls
- Chain Car Hauls

General Offices and Works
FAIRMONT, W. VA.

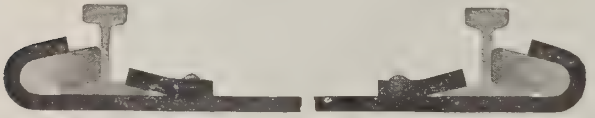
TRADE MARK REGISTERED
FAIRMONT 101-20
(The Mark of Quality.)

Specialties

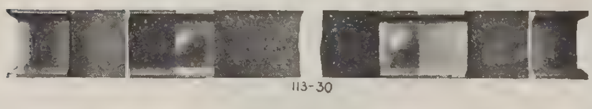
- Steel Mine Ties
- R. R. Car Retarders
- Portable—
- Electric Mine Pumps
- Power Coal Augers
- Box Car Trucks
- Mine Car Trucks

COAL MINE EQUIPMENTS

FAIRMONT Steel Mine Ties (Ross Patent).

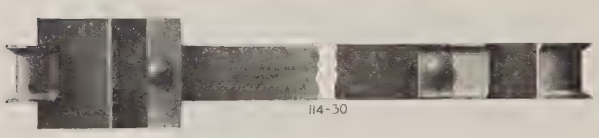


STANDARD STYLE "A" FAIRMONT STEEL MINE TIE

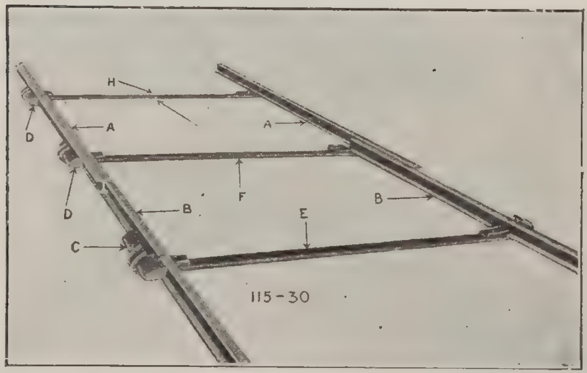


The best and most widely used Steel Mine Tie ever made. More than half million in use today.

STANDARD STYLE "B" FAIRMONT STEEL MINE TIE



Joint Tie for extreme conditions. Has base plate and clip 4″ wide on one end.



A Section of track laid with Fairmont Standard Style "A" Steel Ties showing method of advancing track with Jumper Rail.

Fairmont Steel Mine Ties are made of a special Channel Section 2″ wide, 9/16″ high and 3/16″ thick in web (which is heavier in thickness than any steel tie on the market), with gauge clip or same section riveted on tight and ends bent up and over (bent cold) for wedge.

This section gives exceptional stiffness for the size and makes a tie that stands up under most severe conditions for rooms and cross entry work. The thinnest part of the tie is 3/16″ thick and will last for years. We have reports from ties that have been in mines where the worst of sulphur water exists for 3 to 5 years with aparently no bad results on ties.

We illustrate on this page our Standard Style "A" tie which is more widely used than any other steel tie; Standard Style "B" tie which is used by some mines as a joint tie, where heavy cars and gathering motors are used on the tracks, ana a section of track showing jumper rail in position.

"A" is rail turned upside-down as jumper; "B" is rail in permanent position; "C" is wooden wedge (split out of old lumber or props) for holding rail firmly in place; "D" wedges along jumper rail—most miners find this unnecesary as rail when turned up-side-down fits snugly between bent-up end of tie and upright rail and stands up without wedge; "E", "F" and "H" are standard style "A" ties showing rails jointed at one end without splice plates; the joints are broken and jumper on right hand side is advanced almost to point for turning up in permanent position while on the left is just starting in.

On opposite page is shown a piece of track in a mine with a seven (7) ton turrent Mining Machine mounted on it, one side resting on jumper rail, and other illustrating of gathering motor operating on track laid on Fairmont Ties.

Make your track laying a pleasure for the miners and add more **Dollars** to the profit side of your balance sheet by adopting **Fairmont** Ties.

Write for particulars about trial and quantity purchases.

TRADE MARK REGISTERED FAIRMONT

Steel Mine Ties

TRADE MARK REGISTERED FAIRMONT

Advantages of Fairmont Ties.

They hold your tracks true to gauge, and the rail resting on floor between ties makes a solid track on which cars run easily and do not jump off.

They bring the track right down on the floor (the rail resting on floor between ties) which makes it easier to load cars, and in low coal saves taking up three or four inches of bottom, or taking down like amount of roof.

No splice bars, bolts or spikes required in laying the track; the wooden wedge holds the rail firmly in place. On tracks where heavy cars and gathering motors are used, we recommend style "B" ties at rail joints.

The extension of tracks to keep up close to coal is easily accomplished by using jumper rail as described on opposite page. This feature is not found in any other steel tie.

Cost is less than wood—we can prove it.

More coal loaded on cars account of having more height.

Loaders lay their own tracks, saving time and expense.

Less cost to handle steel ties and steel rails than wood.

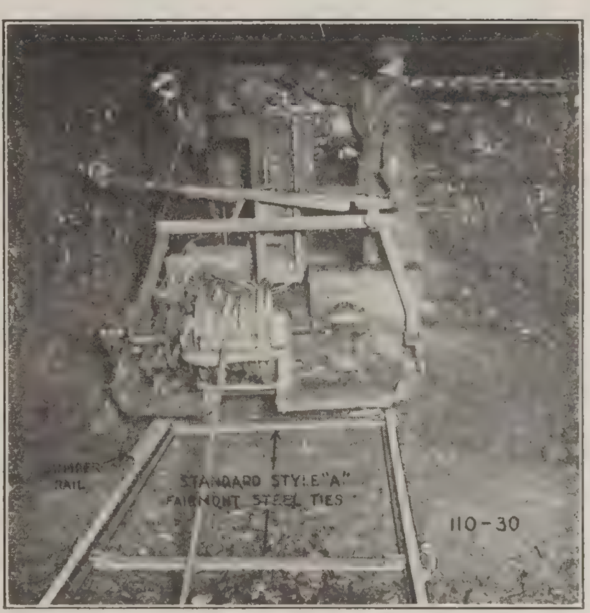
Less lift to put cars back on track in case of wreck.

No track gauge or other tools required for laying up tracks.

Only one-third (1/3) as many ties required as wood, and can be used for years.

Standard tie for 20 pound rail can also be used with 12 pound and 16 pound rail, and tie for 35 pound rail is good for 25 and 30 pound, which is quite an advantage in mines where they have more than one size rail.

In case of wreck and ties get bent they are easily straightened.



7 Ton Turret Mining Machine on Fairmont Steel Mine Tie Track—one side on Jumper Rail

Here is what they have to say about it:

Fleming, Ky., October 28, 1914.

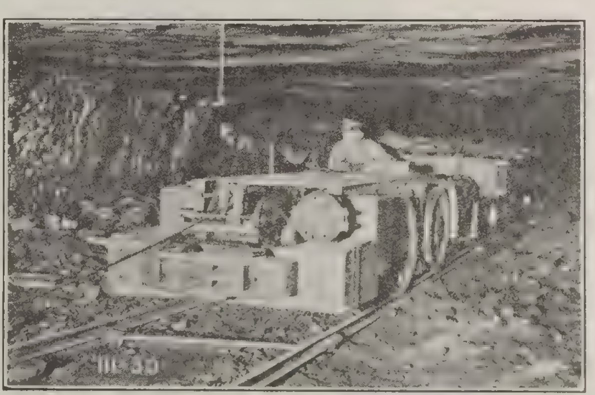
Fairmont Mining Machinery Co.,
Fairmont, W. Va.

Gentlemen:

I hand you herewith picture of our top-cutting machine in actual operation in Mine 303. You will notice in this picture the track is laid on "Fairmont" steel ties. This machine has a sweep of twenty-one feet and weighs seven tons, which gives you an idea of what strain is necessarily put upon these ties to hold it. This picture shows the rail turned upside down on the left hand side which is far better than balling it or laying it on the side. There is no question in my mind but that this tie even in high coal in this region is the greatest labor saving device that has as yet been brought forward.

Yours very truly,
Elkhorn Mining Corporation,
THOS. S. HAYMOND, Manager.

They have loads of timber and high coal yet they find it pays to use **Fairmont** Steel Ties.—Why don't you try them too?



Gathering Motor on Fairmont Steel Tie Track.

CAMBRIA STEEL COMPANY

Executive and General Sales Offices:
MORRIS BLDG, PHILADELPHIA, PA.

Works:
JOHNSTOWN, PA.

District Sales Offices:

ATLANTA
BOSTON
CHICAGO
CINCINNATI
CLEVELAND
DETROIT
JOHNSTOWN
LOS ANGELES
NEW YORK
PHILADELPHIA
PITTSBURGH
ST. LOUIS
SAN FRANCISCO
TACOMA
MONTREAL

Products

Steel Rails

We manufacture Steel Rails in all standard sections from 12 to 125 pounds per yard, and accessories—Splice Bars, Bolts, and Nuts. We are exclusive manufacturers of the Patented Slick Steel Mine Ties.

The Slick Mine Tie
is of rolled steel section combining features of light weight with sufficient strength. There are no loose parts to lose—no spikes. The necessary rail fastenings, which consist of flanged buttons, are always in place, ready for use, and cannot become detached.

The tie is easy to lay. An ordinary adjustable or a special solid wrench is all that is required. Special wrenches furnished with orders. A quarter turn of the wrench clamps each fastening button on the rail, thus much saving in time and labor.

It is stronger than a wooden tie and yet lighter, therefore easier to transport from place to place.

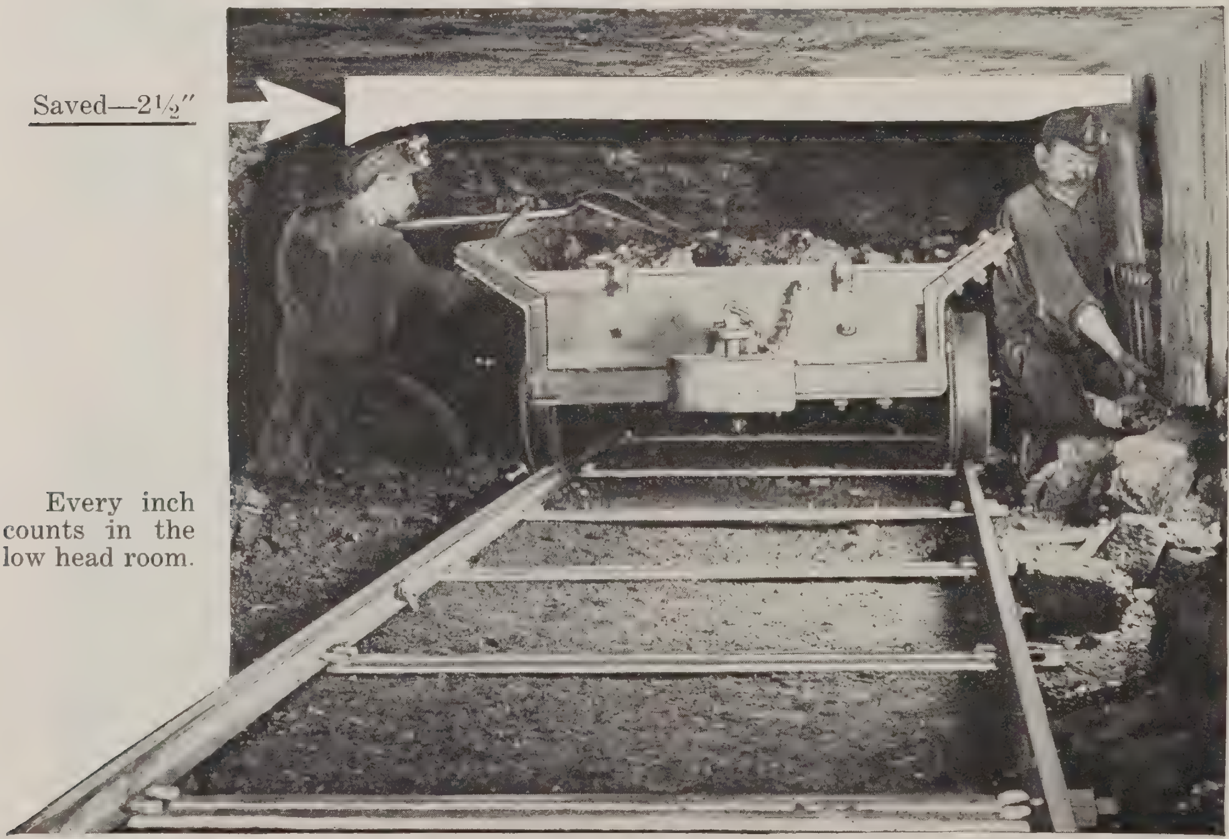
The life of a steel mine tie is very much greater than that of a wooden tie, but of course this depends upon conditions. In locations where the rooms are dry, it is reasonable to believe these ties will last ten years. Where the mine water is very sulphurous the tie would not last so long, but the life may be greatly increased by a treatment of coal tar, asphaltum or similar coating, applied by dipping the tie and fastenings therein. We are prepared to furnish ties in all sizes so coated if desired.

The tie is popular with the miners because it is lighter to carry from place to place and easier to put together.

The Slick Mine Tie gives maximum head room. Note the arrow in the cut below showing the two and one-half inches extra head room obtained by using the Slick Steel Ties, because the steel tie is one-half inch thick, while a wooden tie is at least three inches. The benefits derived from the extra head room, in low rooms and thin seam workings are, easier shoveling, bigger lumps, and cars of larger capacity.

Taking into consideration the length of service, the steel tie is cheaper than wooden ties in practically every locality.

Send for the booklet which tells in more detail why steel ties are better than wooden. Write our nearest district sales office for prices.



Every inch counts in the low head room.

A little more on every load means how many tons a year?

KEYSTONE
THE.
MINING
CATALOG
COMBINED WITH
COAL FIELD
DIRECTORY
CONSOLIDATED PUBLISHING
COMPANY Inc.

HYDRAULIC SECTION

Engineering Data

Specification Data for Pumps.
Table of Capacities of Pumps.
Selection of Proper size Motor for your pump.
Theoretical Horse Power required to raise water to different heights.
Friction of Water in Wrought and Cast Iron Pipes.
Friction of Standard Pipe Fittings.
Capacity of Cylindrical Vessels.
Comparative Table of Pipe Capacities.
Cost of Pumping.
Water Head in Feet and Equivalent Pressure in Pounds Per Square Inch.
Barometric Pressure.
Equivalents in Liquid Measures and Weights.
Input Horse Power Necessary at Various Efficiencies.
Table of Equivalent Pumps.
Table—Standard Sizes of Wrought Pipe.
Table—Standard Sizes of Wrought Welded Tubes.
Chart—Flow of Water Into Pipes.

The following manufacturers have catalogue descriptions in this section:

Aldrich Pump Co.
Allis-Chalmers Mfg. Co.
American Steam Pump Co.
Boyts-Porter & Co.
Byers, A. M., Co.
Cameron, A. S., Steam Pump Works.
Cast Iron Pipe Makers.
Connellsville Mfg. & Mine Supply Co.
Dayton Turbine Pump Co.
De Laval Steam Turbine Co.
Deming Co.
Elmore, G. H.
Epping-Carpenter Pump Co .
Fairmont Mining Machinery Co.
General Electric Co.
Goulds Mfg. Co.
Highland Chemical Products Co.
Kingsford Fdry. & Machine Works.
Michigan Pipe Co.
Morris Machine Works.
National Tube Co.
Platt Iron Works.
Pneumelectric Machine Co.
Reineke-Wagner Pump & Supply Co.
Standard Wood Pipe Co.
Westinghouse Electric & Mfg. Co.

For additional descriptions of Hydraulic Equipment, not appearing in this section, refer to Index of Products in front of book.

WHEN ORDERING PUMPS

Manufacturer wants to know:—

How many gallons you want to handle per minute.

The amount of suction lift, length and size of suction pipes. If you want to use one or more branches to suction. So state.

The amount of discharge lift. Length and size of discharge pipe. If other pumps use same discharge line, so state, giving approximate quantity of water passing through line.

Will the water contain any solids? Give characteer of water and state preference as to metal to be used in water end of pump.

If steam is to be used, give boiler pressure, length, size and condition of steam line and probable pressure at the pump.

If compressed air is to be used, give air pressure at the pump.

If electricity is to be used, give voltage and state alternating or direct current. If alternating, state if single phase, two or three phase, the voltage and number of cycles. Does voltage vary materially?

Courtesy Harris Pump & Supply Co.

To Select Proper Size Motor for Your Pump

Remember that feet elevation given in table includes three distinct elevations. First. Actual difference in elevation of water to be pumped at its lowest point and highest point to which water is elevated. Second. The equivalent of vertical feet necessary to overcome the friction caused by water handled in passing through all the line, including suction and discharge lines, the pump itself and all obstructions, including elbows, bends and gate valves. See Table for friction of water in pipes. Figure five elbows the same as 100 fet of straight pipe. Use gate valves instead of globe valve for water wherever possible. Use swing checks instead of poppet checks. Third. Velocity heads. This is usually so small in mine srvice as to be neglected in calculations.

To find horse-power required for a piston power pump, multiply theoretical horse-power shown in table by 1½ to 2. For triplex pumps up to 100 feet multiply by 1½ to 2. For elevations 100 to 200 feet—1½; for elevations 200 to 400 feet, multiply by 1.4.

For deep well pumps, multiply by 2 to 3.

For centrifugal pumps, multiply by 2 to 2½.

In centrifugal pumps remember that the speed of motor and pump should be right for the elevation and when speeded too high or put on a lower elevation, more water will be pumped and much more power required.

TABLE OF CAPACITY OF PUMPS

The figures at the extreme right and left of the Table are plunger or piston diameters; the line of figures across the top are length of plunger or piston strokes; the figures in the body of the Table are the capacity, or displacement in U. S. gallons, corresponding to a single stroke. To find the capacity for one revolution, multiply the capacity for a single stroke by one, two, three, four or five, for single, duplex, triplex, quadruplex or quintuplex, single-acting; and by two, four, six, eight or ten, for double-acting pumps.

Diameter of Plunger Inches	LENGTH OF STROKE IN INCHES, AND CAPACITY PER STROKE IN U. S. GALLONS, OF PUMP CYLINDER, WITH GIVEN DIAMETER																	Diameter of Plunger Inches
	1	4	5	6	7	8	9	10	12	14	16	18	20	24	30	36	48	
1¼	.0053	.0212	.0266	.0319	.0372	.0425	.0478	.0531	.0637	.0743	.0848	.0955	.1062	.1274	.1590	.1908	.2544	1¼
1⅜	.0064	.0256	.0321	.0385	.0419	.0513	.0578	.0642	.077	.089	.1027	.1156	.1280	.1541	.1920	.2304	.3072	1⅜
1½	.00765	.0306	.0382	.0459	.0535	.0612	.0688	.0765	.0918	.1071	.1224	.1377	.1530	.1836	.2295	.2754	.3672	1½
1¾	.0104	.0416	.0521	.0625	.0729	.0833	.0937	.1041	.1249	.1457	.1666	.1874	.2082	.2499	.3120	.3744	.4992	1¾
2	.0136	.0544	.068	.0816	.0952	.1088	.1224	.136	.1632	.1904	.2176	.2448	.2720	.3264	.4080	.4896	.6528	2
2¼	.0172	.0688	.086	.1033	.1205	.1377	.1548	.1721	.2063	.241	.2754	.3096	.344	.4128	.5160	.6192	.8256	2¼
2½	.02125	.0850	.1062	.1275	.1487	.17	.1912	.2125	.255	.2975	.34	.3825	.4252	.51	.6375	.7650	1.0200	2½
2¾	.0257	.1028	.1285	.1543	.1799	.2057	.2313	.2571	.3085	.3598	.4114	.4626	.5142	.617	.7710	.9252	1.2336	2¾
3	.0306	.1224	.1530	.1836	.2142	.2448	.2754	.306	.3672	.4284	.4896	.5508	.612	.7344	.9180	1.1016	1.4688	3
3¼	.0359	.1436	.1795	.2154	.2513	.2872	.3231	.3594	.4312	.503	.5748	.6466	.7182	.8624	1.0770	1.2924	1.7232	3¼
3½	.04165	.1666	.2082	.2499	.2915	.3332	.3748	.4165	.4998	.5831	.6664	.7497	.833	.9996	1.2495	1.4994	1.9992	3½
3¾	.0478	.1912	.239	.2868	.3346	.3824	.4302	.478	.5736	.6692	.7648	.8605	.9561	1.147	1.4340	1.7208	2.2944	3¾
4	.0544	.2176	.272	.3264	.3808	.4352	.4896	.544	.6528	.7616	.8704	.9792	1.088	1.3050	1.6320	1.9584	2.6112	4
4¼	.0614	.....	.307	.3684	.4298	.4912	.5526	.6141	.7368	.8596	.9824	1.105	1.228	1.473	1.8420	2.2104	2.9472	4¼
4½	.06885	.....	.3442	.4131	.4819	.5508	.6196	.6885	.8262	.9639	1.1016	1.2393	1.377	1.6524	2.0655	2.4786	3.3048	4½
4¾	.0767	.....	.3835	.4602	.5369	.6136	.6903	.7671	.9204	1.073	1.227	1.380	1.534	1.84	2.3010	2.7612	3.6816	4¾
5	.0850	.....	.425	.51	.595	.68	.765	.85	1.02	1.19	1.36	1.53	1.7	2.04	2.5500	3.0600	4.0800	5
5¼	.0937	.....	.....	.5622	.6559	.7496	.8433	.9371	1.124	1.311	1.499	1.686	1.874	2.248	2.8110	3.3732	4.4976	5¼
5½	.10285	.....	.....	.6171	.7199	.8228	.9256	1.0285	1.2342	1:4399	1.6456	1.8513	2.057	2.4684	3.0855	3.7026	4.9368	5½
5¾	.1124	.....	.....	.6744	.7868	.8992	1.011	1.124	1.348	1.573	1.789	2.022	2.248	2.696	3.3720	4.0464	5.3952	5¾
6	.1224	.....	.....	.7314	.8568	.9792	1.1016	1.2240	1.4688	1.7136	1.9584	2.2032	2.448	2.9376	3.6720	4.4064	5.8752	6
6¼	.1328	.....	.....	.7968	.9296	1.062	1.195	1.328	1.593	1.859	2.124	2.39	2.656	3.186	3.9840	4.7808	6.3744	6¼
6½	.1436	.....	.....	.8610	1.0052	1.1488	1.2926	1.4364	1.724	2.0109	2.2982	2.5885	2.8728	3.4473	4.3080	5.1696	6.8928	6½
6¾	.1549	.....	.....	.9294	1.084	1.239	1.394	1.549	1.858	2.168	2.479	2,788	3.098	3.716	4.6470	5.5764	7.4352	6¾
7	.1666	.....	.....	.9996	1.1662	1.3328	1.4994	1.666	1.9992	2.3324	2.6656	2.9988	3.332	3.9984	4.9980	5.9976	7.9968	7
7¾	.2042	.....	.....	1.225	1.429	1.633	1.837	2.042	2.45	2.858	3.266	3.674	4.084	4.9	6.1260	7.3512	9.8016	7¾
8	.2176	.....	.....	1.3056	1.5232	1.7408	1.9584	2.176	2.6112	3.0464	3.4816	3.9168	4.352	5.2224	6.5280	7.8336	10.4448	8
9	.2754	.....	.....	.....	1.9278	2.2032	2.4786	2.754	3.3048	3.8556	4.4064	5.0572	5.508	6.6096	8.2620	9.9144	13.2192	9
10	.3400	.....	.....	.....	.....	2.72	3.06	3.4	4.08	4.76	5.44	6.12	6.8	8.16	10.20	12.2400	16.3200	10
11	.41135	.....	.....	.....	.....	.....	3.7258	4.1139	4.9367	5.7595	6.5823	7.4051	8.2279	9.8735	12.34	14.8086	19.7448	11
12	.4896	.....	.....	.....	.....	.....	.....	4.896	5.8752	6.8544	7.833	8.8128	9.792	11.7504	14.688	17.6256	23.5008	12
13	.5745	.....	.....	.....	.....	.....	.....	.....	6.894	8.042	9.192	10.34	11.49	13.78	17.235	20.6820	27.5760	13
14	.6660	.....	.....	.....	.....	.....	.....	.....	7.994	9:328	10.66	11.99	13.32	15.98	19.98	23.9760	31.968	14
15	.7645	.....	.....	.....	.....	.....	.....	.....	.....	10.70	12.23	13.76	15.29	18.35	22.935	27.5220	36.696	15
16	.8700	.....	.....	.....	.....	.....	.....	.....	.....	12.18	13.92	15.66	17.40	20.88	26.10	31.3200	41.760	16
18	1.1010	.....	.....	.....	.....	.....	.....	.....	.....	.....	17.61	19.81	22.02	26.42	33.03	39.636	52.848	18
20	1.3600	.....	.....	.....	.....	.....	.....	.....	.....	.....	21.76	24.48	27.2	32.64	40.80	48.96	65.280	20

Courtesy of The Aldrich Pump Co.

Capacities of Single-Acting Triplex Pumps

Dia. of Plunger in Inches	Length of Stroke in inches, and Capacity per Revolution in U. S. Gallons, of Single-Acting Triplex Pump with given Diameter																Dia. of Plunger in Inches
	1	2	3	4	5	6	7	8	9	10	12	14	16	18	20	24	
1	.0102	.020	.030	.040	.051	.061	.071	.082	.092	.102	.122	143	.163	.184	.204	.244	1
1¼	.0159	.031	.047	.063	.079	095	.111	.127	.143	159	.191	.223	.254	.286	.318	.382	1¼
1½	.0229	.045	.069	.091	.114	.137	.161	.184	.206	229	.275	.322	.367	.413	.459	.551	1½
2	.0408	.081	.122	.163	.204	.244	.285	.326	.367	.408	.489	.571	.653	.735	.816	.979	2
2½	.0637	.127	.191	.255	.318	.382	.447	510	574	.637	.765	.894	1:02	1.15	1.27	1.53	2½
3	.0918	.183	.276	.367	.459	.550	.642	.734	.826	918	1.10	1.28	1.47	1.65	1.83	2.20	3
3½	.1249	.249	.374	.498	.629	.749	.875	998	1.12	1.25	1.49	1.75	2.00	2.24	2.50	3.00	3½
4	.1632	.326	.489	.652	.816	.980	1.14	1.31	1.47	1.63	1.96	2.28	2.62	2.94	3.27	3.92	4
4½	.2065	.413	.619	.826	1.03	1.24	1.44	1.65	1.86	2.06	2.48	2.89	3.30	3.72	4 13	4.96	4½
5	.2550	.510	.765	1.02	1.27	1.53	1.78	2.04	2.30	2.55	3.06	3.57	4.08	4.59	5.10	6.12	5
5½	.3085	.617	.925	1.23	1.54	1.85	2.16	2.47	2.78	3.08	3 70	4.32	4.94	5.55	6.17	7.40	5½
6	.3672	.734	1.10	1.46	1.83	2.20	2.57	2.94	3.30	3.67	4.40	5.13	5.87	6.60	7.35	8.81	6
6½	.4308	.861	1.29	1.72	2.15	2.58	3.02	3.45	3.88	4.31	5 17	6.03	6.89	7.75	8.62	10.34	6½
7	.4998	.999	1.49	1.99	2.49	2.99	3.50	3.99	4.50	5.00	5.98	6.99	7 99	9.00	10.00	11.99	7
7½	.5737	1.14	1.72	2.29	2.86	3.44	4.02	4.58	5.16	5.74	6.88	8.03	9.17	10.32	11.47	13.77	7½
8	.6528	1.30	1.95	2.61	3.26	3.91	4.67	5.22	5.87	6.53	7.83	9.14	10.44	11.74	13.05	15.66	8
8½	.7369	1.47	2.21	2.84	3.68	4.42	5.16	5.90	6.62	7.37	8.84	10.31	11.77	13.24	14.73	17.68	8½
9	.8262	1.65	2.48	3.30	4.13	4.96	5.78	6.61	7.43	8.26	9.91	11.56	13.22	14.87	16.52	19.83	9
9½	.9205	1.84	2.76	3.68	4.60	5.52	6.45	7.36	8.28	9.20	11.04	12.88	14.72	16.57	18.40	22.09	9½
10	1.020	2.04	3.06	4.08	5.10	6.12	7.14	8.16	9.18	10.20	12.24	14.28	16.32	18.36	20.40	24.48	10
11	1.234	2.46	3.70	4.93	6.17	7.40	8.64	9.87	11.10	12.34	14.81	17.28	19.74	22.21	24.68	29.62	11
12	1.468	2.93	4.40	5.87	7.34	8.81	10.28	11.75	13.21	14.69	17 62	20.56	23.50	26.42	29.38	35.25	12
13	1.723	3.44	5.17	6.89	8.61	10.34	12.06	13.78	15.51	17.24	20.68	24.12	27.57	31.02	34.47	41.36	13
14	1.998	3.99	5.99	7.99	9.99	11.98	13.99	15.99	17.99	19.98	23.97	27.97	31 97	35.96	39.96	47.95	14
15	2.293	4.58	6.88	9.17	11.46	13.74	16.05	18.34	20.64	22.94	27.52	32.11	36.79	41.28	45.87	55.04	15
16	2.610	5.22	7.83	10.44	13.05	15.66	18.27	20.88	23.49	26.10	31.32	36.54	41 76	46.98	52.20	62.64	16
17	2.947	5.89	8.84	11.79	14.74	17.69	20.62	23.58	26.53	29.47	35.37	41 25	47 16	53.06	58.95	70.75	17
18	3.303	6.60	9.90	13.21	16.52	19.82	23.12	26.42	29.72	33.03	39.64	46 24	52.85	59.45	66.06	79.27	18
19	3.682	7.36	11.04	14.72	18.41	22.09	25.78	29.46	33.14	36.82	44 19	51.55	58.91	66.28	73.64	88.37	19
20	4.080	8.16	12.24	16.32	20.40	24.48	28.56	32.64	36.72	40.80	48 96	57.12	65 28	73.44	89.76	97.92	20

Capacities of Single-Acting Quintuplex Pumps

Dia. of Plunger in Inches	Length of Stroke in inches, and Capacity per Revolution in U. S. Gallons, of Single-Acting Quintuplex Pump with given Diameter																Dia. of Plunger in Inches
	1	2	3	4	5	6	7	8	9	10	12	14	16	18	20	24	
1	.0170	.034	.051	.068	.085	.102	.119	.136	.153	.170	.204	.238	.272	.306	.340	.408	1
1¼	.0265	.053	.079	.106	.132	.159	.185	.212	.238	.265	.318	.371	.424	.477	.730	.636	1¼
1½	.0382	.076	.114	.153	.191	.228	.268	.306	.344	.382	.459	.535	.612	.688	.764	.918	1½
2	.0680	.136	.204	.272	.340	.408	.476	.544	.612	.680	.816	.952	1.09	1.22	1.36	1.632	2
2½	.1062	.212	.319	.425	.531	.637	.743	.850	.956	1.06	1.27	1.49	1.70	1.91	2.12	2.54	2½
3	.1530	.306	.459	.612	.765	.918	1.07	1.22	1.38	1.53	1.83	2.14	2.45	2.75	3.06	3.66	3
3½	.2082	.416	.625	.833	1.04	1.25	1.45	1.66	1.87	2.08	2.50	2.91	3.33	3.75	4.16	5.00	3½
4	.2720	.544	.816	1.09	1.36	1.63	1.90	2.17	2.45	2.72	3.26	3.81	4.35	4.89	5.44	6.52	4
4½	.3442	.688	1.03	1.37	1.72	2.06	2.41	2.75	3.10	3.44	4.13	4.82	5.51	6.19	6.88	8.26	4½
5	.4250	.850	1.27	1.70	2.12	2.55	2.97	3.40	3.82	4.25	5.10	5.95	6.80	7.65	8.50	10.20	5
5½	.5142	1.03	1.54	2.06	2.57	3.08	3.60	4.13	4.63	5.14	6.17	7.20	8.27	9.25	10.28	12.34	5½
6	.6120	1.22	1.83	2.45	3.06	3.67	4.28	4.89	5.51	6.12	7.34	8.57	9.79	11.01	12.24	14.68	6
6½	.7180	1.43	2.15	2.87	3.59	4.31	5.03	5.74	6.46	7.18	8.62	10.05	11.49	12.92	14.36	17.24	6½
7	.8330	1.66	2.50	3.33	4.16	5.00	5.83	6.66	7.49	8.33	9.99	11.66	13.33	14.99	16.66	19.98	7
7½	.9562	1.91	2.87	3.82	4.78	5.74	6.69	7.65	8.60	9.56	11.47	13.39	15.30	17.21	19.12	22.94	7½
8	1.088	2.17	3.26	4.34	5.44	6.53	7.61	8.70	9.78	10.88	13.05	15.23	17.41	19.58	21.76	26.10	8
8½	1.228	2.45	3.68	4.91	6.14	7.37	8.60	9.82	11.05	12.28	14.74	17.19	19.65	22.11	24.56	29.48	8½
9	1.377	2.75	4.13	5.51	6.88	8.26	9.64	11.02	12.39	13.77	16.52	19.28	22.03	24.78	27.54	33.04	9
9½	1.534	3.07	4.60	6.13	7.67	9.21	10.74	12.27	13.80	15.34	18.41	21.48	24.55	27.61	30.68	36.82	9½
10	1.700	3.40	5.10	6.80	8.50	10.20	11.90	13.60	15.30	17.00	20.40	23.80	27.20	30.60	34.00	40.80	10
11	2.056	4.11	6.17	8.23	10.28	12.34	14.40	16.45	18.51	20.57	24.68	28.79	32.91	37.02	41.14	49.36	11
12	2.448	4.89	7.34	9.79	12.24	14.69	17.14	19.58	22.03	24.48	29.37	34.27	39.17	44.06	48.96	58.74	12
13	2.872	5.74	8.61	11.49	14.36	17.23	20.11	22.98	25.85	28.72	34.47	40.21	45.96	51.70	57.44	68.94	13
14	3.330	6.66	9.99	13.32	16.65	19.98	23.31	26.64	29.97	33.30	39.96	46.62	53.28	59.94	66.60	79.92	14
15	3.822	7.64	11.47	15.29	19.11	22.93	26.76	30.58	34.40	38.22	45.87	53.51	61.16	68.80	76.44	91.74	15
16	4.350	8.70	13.05	17.40	21.75	26.10	30.45	34.80	39.15	43.50	52.20	60.90	69.60	78.30	87.00	104.4	16
17	4.912	9.82	14.74	19.65	24.56	29.48	34.39	39.30	44.21	49.13	58.95	68.78	78.60	88.43	98.26	117.9	17
18	5.505	11.01	16.51	22.02	27.52	33.03	38.53	44.04	49.54	55.05	66.06	77.07	88.08	99.09	110.10	132.1	18
19	6.137	12.27	18.41	24.55	30.68	36.82	42.96	49.10	55.23	61.37	73.64	85.92	98.19	110.47	122.7	147.2	19
20	6.800	13.60	20.40	27.20	34.00	40.80	47.60	54.40	61.20	68.00	81.60	95.20	108.8	122.4	136.0	163.2	20

Courtesy of The Aldrich Pump Co.

THEORETICAL HORSE POWER REQUIRED TO RAISE WATER TO DIFFERENT HEIGHTS.

Elevation Feet	5	10	15	20	25	30	35	40	45	50	60
Gallons per Min.											
5	.006	.012	.019	.025	.031	.037	.044	.05	.06	.06	.07
10	.012	.025	.037	.050	.062	.075	.087	.10	.11	.12	.15
15	.019	.037	.056	.075	.094	.112	.131	.15	.17	.19	.22
20	.025	.050	.075	.100	.125	.150	.175	.20	.22	.25	.30
25	.031	.062	.093	.125	.156	.187	.219	.25	.28	.31	.37
30	.037	.075	.112	.150	.187	.225	.262	.30	.34	.37	.45
35	.043	.087	.131	.175	.219	.262	.306	.35	.39	.44	.52
40	.050	.100	.150	.200	.250	.300	.350	.40	.45	.50	.60
45	.056	.112	.168	.225	.281	.337	.394	.45	.51	.56	.67
50	.062	.125	.187	.250	.312	.375	.437	.50	.56	.62	.75
60	.075	.150	.225	.300	.375	.450	.525	.60	.67	.75	.90
75	.093	.187	.281	.375	.469	.562	.656	.75	.84	.94	1.12
90	.112	.225	.337	.450	.562	.675	.787	.90	1.01	1.12	1.35
100	.125	.250	.375	.500	.625	.750	.875	1.00	1.12	1.25	1.50
125	.156	.312	.469	.625	.781	.937	1.094	1.25	1.41	1.56	1.87
150	.187	.375	.562	.750	.937	1.125	1.312	1.50	1.69	1.87	2.25
175	.219	.437	.656	.875	1.093	1.312	1.531	1.75	1.97	2.19	2.62
200	.250	.500	.750	1.000	1.250	1.500	1.750	2.00	2.25	2.50	3.00
250	.312	.625	.937	1.250	1.562	1.875	2.187	2.50	2.81	3.12	3.75
300	.375	.750	1.125	1.500	1.875	2.250	2.625	3.00	3.37	3.75	4.50
350	.437	.875	1.312	1.750	2.187	2.625	3.062	3.50	3.94	4.37	5.25
400	.500	1.000	1.500	2.000	2.500	3.000	3.500	4.00	4.50	5.00	6.00
500	.625	1.250	1.875	2.500	3.125	3.750	4.375	5.00	5.62	6.25	7.50

Feet Elevation	75	90	100	125	150	175	200	250	300	350	400
Gallons per min.											
5	.09	.11	.12	.16	.19	.22	.25	.31	.37	.44	.50
10	.19	.22	.25	.31	.37	.44	.50	.62	.75	.87	1.00
15	.28	.34	.37	.47	.56	.66	.75	.94	1.12	1.31	1.50
20	.37	.45	.50	.62	.75	.87	1.00	1.25	1.50	1.75	2.00
25	.47	.56	.62	.78	.94	1.09	1.25	1.56	1.87	2.19	2.50
30	.56	.67	.75	.94	1.12	1.31	1.50	1.87	2.25	2.62	3.00
35	.66	.79	.87	1.08	1.31	1.53	1.75	2.19	2.62	3.06	3.50
40	.75	.90	1.00	1.25	1.50	1.75	2.00	2.50	3.00	3.50	4.00
45	.84	1.01	1.12	1.41	1.69	1.97	2.25	2.81	3.37	3.94	4.50
50	.94	1.12	1.25	1.56	1.87	2.19	2.50	3.12	3.75	4.37	5.00
60	1.12	1.35	1.50	1.87	2.25	2.62	3.00	3.75	4.50	5.25	6.00
75	1.40	1.69	1.87	2.34	2.81	3.28	3.75	4.69	5.62	6.56	7.50
90	1.68	2.02	2.25	2.81	3.37	3.94	4.50	5.62	6.75	7.87	9.00
100	1.87	2.25	2.50	3.12	3.75	4.37	5.00	6.25	7.50	8.75	10.00
125	2.34	2.81	3.12	3.91	4.69	5.47	6.25	7.81	9.37	10.94	12.50
150	2.81	3.37	3.75	4.69	5.62	6.56	7.50	9.37	11.25	13.12	15.00
175	3.28	3.94	4.37	5.47	6.56	7.66	8.75	10.94	13.12	15.31	17.50
200	3.75	4.50	5.00	6.25	7.50	8.75	10.00	12.50	15.00	17.50	20.00
250	4.69	5.62	6.25	7.81	9.37	10.94	12.50	15.72	18.75	21.87	25.00
800	5.62	6.75	7.50	9.37	11.25	13.12	15.00	18.75	22.50	26.25	30.00
350	6.56	7.87	8.75	10.94	13.12	15.31	17.50	21.87	26.25	30.62	35.00
400	7.50	9.00	10.00	12.50	15.00	17.50	20.00	25.00	30.00	35.00	40.00
500	9.37	11.25	12.50	15.62	18.75	21.87	25.00	31.25	37.50	43.75	50.00

$$\text{Theoretical Water Horse Power} = \frac{\text{U. S. gallons per minute x head in feet.}}{\text{3970 (4000 approx.).}}$$

$$\text{Theoretical Water Horse Power} = \frac{\text{U. S. gallons per minute x head in pounds.}}{\text{1720.}}$$

$$\text{Brake Horse Power} = \frac{\text{Theoretical Water Horse Power.}}{\text{Pump efficiency.}}$$

1,000,000 U. S. gallons per day = 695 U. S. gallons per minute.
500 pounds per hour = 1 U. S. gallon per minute.

1 Miner's inch = 1½ cubic feet per minute = 11.25 U. S. gallons per minute.
1 Cubic foot fresh water = 62.4 lbs. @ 53° F. = 7.48 U. S. gallons.
1 Cubic foot sea water = 64.3 lbs. approx.
1 U. S. gallon fresh water = 8.33 lbs. @ 53° F. = .1134 cubic feet.
1,000 Boiler Horse Power @ 30 pounds feed = 60 gallons per minute (approx.).

$$\text{Velocity in feet per second} = \frac{\text{.41 x U. S. gallons per minute.}}{\text{(diameter of pipe in inches)}}$$

One Acre-foot = 325,850 U. S. gallons.

The Cost of Pumping

The cost (in dollars) per month (30 days of 24 hours each) of pumping 100 U. S. gallons per minute against 1 ft. lift—the efficiency of Pump and Motor together and the cost of Power being known.

RATE	COST		COMBINED EFFICIENCY—MOTOR AND PUMP—PER CENT.												
(Cents) Kw. Hr.	(Cents) H. P. Hour	(Dollars) H. P. Year	40	45	50	55	60	65	70	73	76	80	83	86	90
			Cost per month (30 days—24 hours each) 100 U. S. Gallons per minute against 1 ft. Lift												
0.1	.0007	6.54	.034	.030	.027	.025	.023	.021	.019	.019	.018	.017	.016	.016	.015
0.2	.0015	13.07	.068	.060	.054	.049	.045	.042	.039	.037	.036	.034	.033	.032	.030
0.3	.0022	19.61	.102	.091	.082	.074	.068	.063	.058	.056	.054	.051	.049	.047	.045
0.4	.0030	26.14	.136	.121	.109	.099	.091	.084	.078	.074	.072	.068	.065	.063	.060
0.5	.0037	32.68	.170	.151	.136	.123	.113	.104	.097	.093	.089	.085	.082	.079	.075
0.6	.0045	39.21	.204	.181	.163	.148	.136	.125	.116	.112	.107	.102	.098	.095	.091
0.7	.0052	45.75	.238	.211	.190	.173	.158	.146	.136	.130	.125	.119	.115	.111	.106
0.8	.0060	52.28	.272	.241	.217	.198	.181	.167	.155	.149	.143	.136	.131	.126	.121
0.9	.0067	58.82	.305	.272	.244	.222	.204	.188	.175	.167	.161	.153	.147	.142	.136
1.0	.0075	65.35	.339	.302	.272	.247	.226	.209	.194	.186	.179	.170	.164	.158	.151
1.1	.0082	71.89	.373	.332	.299	.272	.249	.230	.213	.205	.197	.187	.180	.174	.167
1.2	.0090	78.42	.407	.362	.326	.296	.272	.251	.233	.223	.214	.204	.196	.189	.181
1.3	.0097	84.96	441	.392	.353	.321	.294	.272	.252	.242	.232	.221	.213	.205	.196
1.4	.0104	91.49	.475	.422	.380	.346	.317	.292	.272	.260	.250	.238	.229	.221	.211
1.5	.0112	98.02	.509	.453	.407	.370	.339	.313	.291	.279	.268	.255	.245	.237	.226
1.6	.0119	104.56	.543	.483	.434	.395	.362	.334	.310	.298	.286	.271	.262	.253	.241
1.7	.0127	111.09	.577	.513	.462	.420	.385	.355	.330	.316	.304	.288	.278	.268	.256
1.8	.0134	117.63	.611	.543	.489	.444	.407	.376	.349	.335	.322	.305	.294	.284	.272
1.9	.0142	124.16	.645	.573	.516	.469	.430	.397	.368	.353	.339	.322	.311	.300	.287
2.0	.0149	130.70	.679	.603	.543	.494	.453	.418	.388	.372	.357	.339	.327	.316	.302
2.1	.0157	137.23	.713	.633	.570	.518	.475	.439	.407	.391	.375	.356	.343	.332	.317
2.2	.0164	143.77	.747	.664	.597	.543	.498	.459	.427	.409	.393	.373	.360	.347	.332
2.3	.0172	150.30	.781	.694	.624	.568	.520	.480	.446	.428	.411	.390	.376	.363	.347
2.4	.0179	156.84	.814	.724	.652	.592	.543	.501	.465	.446	.429	.407	.393	.379	.362
2.5	.0187	163.37	.848	.754	.679	.617	.566	.522	.485	.465	.447	.424	.409	.395	.377
2.6	.0194	169.91	.882	.784	.706	.642	.588	.543	504	.484	.464	.441	.425	.410	.392
2.7	.0201	176.44	.916	.814	.733	.666	.611	.564	.524	.502	.482	.458	.442	.426	.407
2.8	.0209	182.98	.950	.845	.760	.691	.633	.585	.543	.521	.500	.475	.458	.442	.422
2.9	.0216	189.51	.984	.875	.787	.716	.656	.606	.562	.539	.518	.492	.474	.458	437
3.0	.0224	196.05	1.018	.905	.814	.740	.679	.627	.582	.558	.536	.509	.491	.474	.453
3.1	.0231	202.58	1.052	.935	.842	.765	.701	.647	.601	.576	.554	.525	.507	.489	.468
3.2	.0239	209.12	1.086	.965	.869	.790	.724	.668	.621	.595	.572	.543	.523	.505	.483
3.3	.0246	215.65	1.120	.995	.896	.814	.747	.689	.640	.614	.589	.560	.540	.520	.498
3.4	.0254	222.19	1.154	1.025	.923	.839	.769	.710	.659	.632	.607	.577	.556	.536	.513
3.5	.0261	228.72	1.188	1.056	.950	.864	.792	.731	.679	651	.625	.594	.572	.552	.528
3.6	.0269	235.26	1.222	1.086	.977	.888	.814	.752	.698	.669	.643	.611	.589	568	.543
3.7	.0276	241.79	1.256	1.116	1.004	.913	.837	.773	.717	.688	.661	.628	.605	.583	.558
3.8	.0283	248.33	1.289	1.146	1.032	.938	.860	.794	.737	.707	.679	.645	.621	.599	.573
3.9	.0291	254.86	1.323	1.176	1.059	.963	.882	.814	.756	.725	.697	.662	.638	.615	.588
4.0	.0298	261.40	1.357	1.206	1.086	.987	.905	.835	.776	.744	.714	.679	.654	.631	.603
4.1	.0306	267.93	1.391	1.237	1.113	1.012	.928	.856	.795	.762	.732	.696	.671	.647	.618
4.2	.0313	274.47	1.425	1.267	1.140	1.037	.950	.877	.814	.781	.750	.713	.687	.663	.633
4.3	.0321	281.00	1.459	1.297	1.167	1.061	.973	.898	834	.800	.768	.730	.703	.679	.649
4.4	.0328	287.54	1.493	1.327	1.194	1.086	.995	.919	.853	.818	.786	.747	.720	.694	.664
4.5	.0336	294.07	1.527	1.357	1.222	1.111	1.018	.940	.873	.837	.804	.764	.736	.710	.679
4.6	.0343	300.61	1.561	1.388	1.249	1.135	1.041	.961	.892	.855	.822	.780	.752	.726	.694
4.7	.0351	307.14	1.595	1.418	1.276	1.160	1.063	.981	.911	.874	.839	.797	.769	.742	.709
4.8	.0358	313.68	1.629	1.448	1.303	1.185	1.086	1.002	.931	.893	.857	.814	.785	.758	.724
4.9	.0366	320.21	1.663	1.478	1.330	1.209	1.108	1.023	.950	.911	.875	.831	.801	.773	.739
5.0	.0373	326.75	1.697	1.508	1.357	1.234	1.131	1.044	.970	.930	.893	.848	.818	.789	.755

To find the cost per month of Pumping any Quantity per minute against any Lift—Divide the desired number of U. S. Gallons per minute by 100, and multiply the Quotient by the required Lift and then by the value in the table found OPPOSITE the price paid for Power, and UNDER the combined efficiency of Motor and Pump.

Water Head in Feet and Equivalent Pressure in Pounds per Square Inch

Head in Feet	Equival't Pressure in Pounds per sq. in.	Head in Feet	Equival't Pressure in-Pounds per sq. in.	Head in Feet	Equival't Pressure in Pounds per sq. in.	Head in Feet	Equival't Pressure in Pounds per sq. in.	Head in Feet	Equivalent Pressure in Pounds per sq. in.
1	0.43	64	27.72	127	55.01	189	81.87	1475	638.68
2	0.86	65	28.15	128	55.44	190	82.30	1500	649.50
3	1.30	66	28.58	129	55.88	191	82.73	1525	660.33
4	1.73	67	29.02	130	56.31	192	83.17	1550	671.15
5	2.16	68	29.45	131	56.74	193	83.60	1575	681.98
6	2.59	69	29.88	132	57.18	194	84.03	1600	692.80
7	3.03	70	30.32	133	57.61	195	84.47	1625	703.63
8	3.46	71	30.75	134	58.04	196	84.90	1650	714.45
9	3.89	72	31.18	135	58.48	197	85.33	1675	725.28
10	4.33	73	31.62	136	58.91	198	85.76	1700	736.10
11	4.76	74	32.05	137	59.34	199	86.20	1725	746.93
12	5.20	75	32.48	138	59.77	200	86.60	1750	757.75
13	5.63	76	32.92	139	60.21	225	97.43	1775	768.58
14	6.06	77	33.35	140	60.64	250	108.25	1800	779.40
15	6.49	78	33.78	141	61.07	275	119.08	1825	790.23
16	6.93	79	34.21	142	61.51	300	129.90	1850	801.05
17	7.36	80	34.65	143	61.94	325	140.73	1875	811.88
18	7.79	81	35.08	144	62.37	350	151.55	1900	822.70
19	8.22	82	35.52	145	62.81	375	162.38	1925	833.53
20	8.66	83	35.95	146	63.24	400	173.20	1950	844.35
21	9.09	84	36.39	147	63.67	425	184.03	1975	855.18
22	9.53	85	36.82	148	64.10	450	194.85	2000	866.00
23	9.96	86	37.25	149	64.54	475	205.68	2025	876.83
24	10.39	87	37.68	150	64.97	500	216.50	2050	887.65
25	10.82	88	38.12	151	65.40	525	227.33	2075	898.48
26	11.26	89	38.55	152	65.84	550	238.15	2100	909.30
27	11.69	90	38.98	153	66.27	575	248.98	2125	920.13
28	12.12	91	39.42	154	66.70	600	259.80	2150	930.95
29	12.55	92	39.85	155	67.14	625	270.63	2175	941.78
30	12.99	93	40.28	156	67.57	650	281.45	2200	952.60
31	13.42	94	40.72	157	68.0	675	292.28	2225	963.43
32	13.86	95	41.15	158	68.43	700	303.10	2250	974.25
33	14.29	96	41.58	159	68.87	725	313.93	2275	985.08
34	14.72	97	42.01	160	69.31	750	324.75	2300	995.90
35	15.16	98	42.45	161	69.74	775	335.58	2325	1006.73
36	15.59	99	42.88	162	70.17	800	346.40	2350	1017.55
37	16.02	100	43.31	163	70.61	825	357.23	2375	1028.38
38	16.45	101	43.75	164	71.04	850	368.05	2400	1039.20
39	16.89	102	44.18	165	71.47	875	378.88	2425	1050.03
40	17.32	103	44.61	166	71.91	900	389.70	2450	1060.85
41	17.75	104	45.05	167	72.34	925	400.53	2475	1071.68
42	18.19	105	45.48	168	72.77	950	411.35	2500	1082.50
43	18.62	106	45.91	169	73.20	975	422.18	2525	1093.33
44	19.05	107	46.34	170	73.64	1000	433.00	2550	1104.15
45	19.49	108	46.78	171	74.07	1025	443.83	2575	1114.98
46	19.92	109	47.21	172	74.50	1050	454.65	2600	1125.80
47	20.35	110	47.64	173	74.94	1075	465.48	2625	1136.63
48	20.79	111	48.08	174	75.37	1100	476.30	2650	1147.45
49	21.22	112	48.51	175	75.80	1125	487.13	2675	1158.28
50	21.65	113	48.94	176	76.23	1150	497.95	2700	1169.10
51	22.09	114	49.38	177	76.67	1175	508.78	2725	1179.93
52	22.52	115	49.81	178	77.10	1200	519.60	2750	1190.75
53	22.95	116	50.24	179	77.53	1225	530.43	2775	1201.58
54	23.39	117	50.68	180	77.97	1250	541.25	2800	1212.40
55	23.82	118	51.11	181	78.40	1275	552.08	2825	1223.23
56	24.26	119	51.54	182	78.84	1300	562.90	2850	1234.05
57	24.69	120	51.98	183	79.27	1325	573.73	2875	1244.88
58	25.12	121	52.41	184	79.70	1350	584.55	2900	1255.70
59	25.55	122	52.84	185	80.14	1375	595.38	2925	1266.53
60	25.99	123	53.28	186	80.57	1400	606.20	2950	1277.35
61	26.42	124	53.71	187	81.0	1425	617.03	2975	1288.18
62	26.85	125	54.15	188	81.43	1450	627.85	3000	1299.00
63	27.29	126	54.58						

Equivalents of Liquid Measures and Weights

Measures and Weights for Comparison	U. S. Gallon	Imperial Gallon	Cubic Inch	Cubic Foot	Cubic Meter	Liter	Pound	*Vedro	*Pood
	MEASURE AND WEIGHT EQUIVALENTS OF ITEMS IN FIRST COLUMN								
U.S. Gal.	1.	.833	231.	.1337	.00378	3.785	8.33	.308	.231
Imp Gal	1.20	1	277.27	.1604	.00454	4 542	10	369	.277
Cu. In...	.0043	.00358	1.	.00057	.000016	.0163	.0358	.00132	.001
Cu. Ft...	7.48	6.235	1728.	1.	.02827	28.312	62.355	2.304	1.728
Cu. Met..	264.17	220.05	61023.	35.319	1.	1000.	2200.54	81 364	61.023
Liter....	.26417	.2200	61.023	.0353	.001	1.	2.2005	.08136	.06102
* Vedro	3.249	2.706	750.1	.4344	.01228	12.29	27.06	1.	.7501
Pood.	4.328	3.607	1000.	.578	.01636	16.381	36.07	1.333	1.
Pound ..	.12	.1	27.72	.016	.00045	454	1.	0369	.0277

*Vedro and Pood are a Russian measure and weight respectively

Barometric Pressures

(At Different Altitudes, with Equivalent Head of Water and the Vertical Suction Lift of Pumps.)

Altitude	Barometric Pressure	Equivalent Head of Water	Practical Suction Lift of Pumps
Sea Level....	14.70 lbs. per sq. in.	33.95 feet	25 feet
¼ mile (1320 ft.) above sea level	14.02 " "	32.38 "	24 "
½ " (2640 ") " "	13.33 " "	30.79 "	23 "
¾ " (3960 ") " "	12.66 " "	29.24 "	21 "
1 " (5280 ") " "	12.02 " "	27.76 "	20 "
1¼ " (6600 ") " "	11.42 " "	26.38 "	19 "
1½ " (7920 ") " "	10.88 " "	25.13 "	18 "
2 " (10560 ") " "	9.88 " "	22.82 "	17 "

Barometer reading in inches multiplied by 0.4908 equals pressure per sq. in.

Input Horse-Power Necessary at Various Efficiencies

(Pump and Motor Combined)

Water H.P. Desired	40	45	50	55	60	65	70	72	74	76	78	80	82	84	86	88	90	Water H.P. Desired
	Combined Efficiency—Motor and Pump—Per Cent.																	
1	2.5	2.2	2.0	1.8	1.7	1.5	1.4	1.4	1.4	1.3	1.3	1.3	1.2	1.2	1.2	1.1	1.1	1
2	5.0	4.4	4.0	3.6	3.3	3.1	2.9	2.8	2.7	2.6	2.6	2.5	2.4	2 4	2.3	2.3	2.2	2
3	7.5	6.7	6.0	5.4	5.0	4.5	4.3	4.2	4.1	3.9	3.8	3.8	3.7	3.6	3.5	3.4	3.3	3
4	10.0	8.9	8.0	7.2	6.7	6.2	5.7	5.6	5.4	5.3	5.1	5.0	4.9	4.8	4.7	4.5	4.4	4
5	12.5	11.1	10.0	9.0	8.3	7.7	7.1	6.9	6.8	6.6	6.4	6.3	6.1	6.0	5.8	5.7	5.6	5
10	25.0	22.3	20.0	18.2	16.7	15.4	14.3	13.9	13.5	13.1	12.8	12.5	12.2	11.9	11.6	11.4	11.1	10
20	50.0	44.4	40.0	36.4	33.3	30.8	28.6	27.8	27.0	26.3	25.7	25.0	24.4	23.8	23.3	22.7	22.2	20
30	75.0	66.7	60.0	54.6	50.0	46.2	42.8	41.7	40.6	39.5	38.5	37.5	36.6	35.7	34.9	34.1	33.3	30
40	100.0	88.9	80.0	72.7	66.7	61.6	57.2	55.6	54.1	52.6	51.3	50.0	48.8	47.6	46.5	45.4	44.4	40
50	125.0	111.2	100.0	90.8	83.3	77.0	71.5	69.4	67.6	65.8	64.2	62.5	61.0	59.5	58.2	56.8	55.6	50
60	150.0	133.3	120.0	109.1	100.0	92.3	85.7	83.3	81.1	79.0	76.9	75.0	73.2	71.4	69.8	68.2	66.7	60
70	175.0	155.5	140.0	127.3	116.7	107.7	100.0	97.2	94.6	92.2	89.7	87.5	85.3	83.3	81.4	79.5	77.8	70
80	200.0	177.7	160.0	145.4	133.3	123.1	114.3	111.2	108.2	105.3	102.5	100.0	97.6	95.3	93.1	90.8	88.9	80
90	225.0	200.0	180.0	163.6	150.0	138.5	128.6	125.0	121.6	118.5	115.3	112.5	109.7	107.2	104.6	102.3	100.0	90
100	250.0	222.2	200.0	181.8	166.7	153.7	142.8	138.9	135.1	131.6	128.2	125.0	121.9	119.1	116.3	103.7	111.2	100
125	312.5	277.5	250.0	227.3	208.5	192.3	178.6	173.6	168.8	164.3	160.3	156.2	152.4	148.8	145.3	142.0	138.9	125
150	375.0	333.2	300.0	273.0	250.0	231.0	214.5	208.5	202.7	197.4	192.3	187.5	183.0	178.6	174.4	170.4	166.7	150
175	437.5	338.8	350.0	318.0	291.5	269.0	250.0	243.0	236.7	230.1	224.5	218.5	213.5	208.5	203.5	198.8	194.4	175
200	500.0	444.0	400.0	364.0	333.0	308.0	286.0	278.0	270.0	263.0	257.0	250.0	244.0	288.0	233.0	227.0	222.0	200
225	563.0	500.0	450.0	409.0	375.0	346.0	321.7	313.0	304.0	296.0	288.0	281.0	275.0	268.0	262.0	255.0	250.0	225
250	625.0	556.0	500.0	454.0	417.0	385.0	357.0	347.0	338.0	329.0	321.0	313.0	305.0	298.0	291.0	284.0	278.0	250
300	750.0	667.0	600.0	546.0	500.0	462.0	428.0	417.0	406.0	395.0	385.0	375.0	366.0	357.0	349.0	341.0	333.0	300
350	875.0	778.0	700.0	637.0	583.0	538.0	500.0	487.0	473.0	461.0	448.0	438.0	427.0	417.0	407.0	398.0	389.0	350
400	1000.0	889.0	800.0	727.0	667.0	616.0	572.0	556.0	541.0	527.0	513.0	500.0	488.0	477.0	465.0	454.0	444.0	400
450	1125.0	1000.0	900.0	818.0	750.0	692.0	643.0	625.0	608.0	592.0	577.0	563.0	549.0	536.0	523.0	511.0	500.0	450
500	1250.0	1112.0	1000.0	908.0	833.0	770.0	715.0	694.0	676.0	658.0	641.0	625.0	610.0	595.0	582.0	568.6	556.0	500

Table for Equalizing Pipes

The size of main pipe is given in the column at the left. The number of branches is given in the line on top, and the proper size of branches is given in the body of the table on the line of each main and beneath the desired number of branches.

In commercial sizes the nominal 1¼-inch pipe is generally over-size, often as large as 1⅜. It is safe to call it 1.3 inch, and it is so figured in the table. Exact sizes are given for branch pipes. The designer of the pipe system can thus better select the commercial sizes to be used.

Size of Main Pipe	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Size of Main Pipe
	NUMBER OF BRANCHES															
1	.758	.644	.574	.525	.488	.459	.435	.415	.398	.383	.370	.358	.348	.338	.330	1
1¼	.985	.838	.747	.683	.635	.597	.556	.540	.518	.498	.482	.466	.452	.440	.428	1¼
1½	1.14	.967	.861	.788	.733	.689	.653	.623	.597	.575	.555	.538	.522	.508	.494	1½
2	1.52	1.29	1.15	1.05	.977	.918	.870	.830	.796	.766	.740	.717	.696	.677	.660	2
2½	1.89	1.61	1.44	1.31	1.22	1.15	1.09	1.09	.995	.958	.925	.896	.870	.846	.825	2½
3	2.27	1.92	1.72	1.58	1.47	1.38	1.31	1.25	1.19	1.15	1.11	1.08	1.04	1.02	.989	3
3½	2.65	2.26	2.01	1.84	1.71	1.61	1.52	1.45	1.39	1.34	1.30	1.25	1.22	1.18	1.15	3½
4	3.03	2.58	2.30	2.10	1.95	1.84	1.74	1.66	1.59	1.53	1.48	1.43	1.39	1.35	1.32	4
4½	3.41	2.90	2.58	2.36	2.20	2.07	1.96	1.87	1.79	1.72	1.67	1.61	1.57	1.52	1.48	4½
5	3.79	3.22	2.87	2.63	2.44	2.30	2.18	2.08	1.99	1.92	1.85	1.79	1.74	1.69	1.65	5
6	4.55	3.87	3.45	3.15	2.93	2.75	2.61	2.49	2.39	2.30	2.22	2.15	2.09	2.03	1.98	6
7	5.30	4.51	4.02	3.68	3.42	3.21	3.05	2.91	2.79	2.68	2.59	2.51	2.44	2.37	2.31	7
8	6.06	5.16	4.59	4.20	3.91	3.67	3.48	3.32	3.18	3.09	2.96	2.87	2.78	2.71	2.64	8
9	6.82	5.80	5.17	4.73	4.40	4.13	3.92	3.74	3.58	3.45	3.33	3.23	3.13	3.04	2.97	9
10	7.58	6.44	5.74	5.25	4.88	4.59	4.35	4.15	3.98	3.83	3.70	3.59	3.48	3.38	3.30	10
12	9.08	7.73	6.89	6.30	5.86	5.51	5.22	4.98	4.78	4.60	4.44	4.30	4.18	4.06	3.96	12

Courtesy of The Aldrich Pump Co.

Importance of Considering the Friction of Water in Pipes

In estimating the total head against which a given quantity of water is to be delivered particular attention is called to the importance of considering the friction of water in pipes, elbows and valves. In writing for estimates the length and size of suction and discharge pipes, and the number of tees, ells and valves must be given.

The importance of using large enough pipes thereby saving power is illustrated as follows: 500 gallons delivered per minute through a 4-inch pipe (see friction table) means a friction head of 170.53 feet for each 1000 feet of pipe; the same quantity delivered through an 8-inch pipe produces a friction head of but 5.64 feet per each 1000 feet of pipe.

Friction of Water in Wrought and Cast Iron Pipes

Frictional heads at given rates of discharge in clean wrought iron pipe. (Inside Diam.) for each 100 feet of length

U. S. Gal. per Minute	U. S. Gal. per 24 Hours	¾ In. Pipe		1 In. Pipe		1¼ In. Pipe		1½ In. Pipe		2 In. Pipe		2½ In. Pipe		3 In. Pipe	
		Friction hd		Friction hd		Friction hd		Friction hd		Friction hd		Friction hd		Friction hd	
		Feet	Lbs.	Feet	Lbs.	Feet	Lbs.	Feet	Lbs.	Feet	Lbs.	Feet	Lbs.	Feet	Lbs.
5	7200	7.59	3.30	1.93	.84	.71	.31	.27	.12					....	....
10	14400	29.90	13.00	10.26	3.16	2.41	1.05	1.08	.47	....	....	....	....	....	....
15	21600	66.01	28.70	16.05	6.98	5.47	2.38	2.23	.97	....	....	....	....	....	....
20	28800	115.92	50.40	28.29	12.30	9.36	4.07	3.81	1.66	....	....	....	....	....	....
25	36000	....	....	43.70	19.00	14.72	6.40	6.02	2.62	1.18	.51	....	....	....	....
30	43200	....	....	63.25	27.50	21.04	9.15	8.62	3.75	2.09	.91	....	....	....	....
35	50400	....	....	85.10	37.00	28.52	12.40	11.61	5.05	2.76	1.20	....	....	....	....
40	57600	....	....	110.40	48.00	37.03	16.10	14.99	6.52	3.68	1.60	1.19	.52	....	....
45	64800	....	....	....	....	46.46	20.20	18.74	8.15	4.60	2.00	1.49	.65	....	....
50	72000	....	....	....	....	57.27	24.90	23.00	10.00	5.61	2.44	1.86	.81	.80	.35
75	108000	....	....	....	....	129.00	56.10	51.52	22.40	12.23	5.32	4.14	1.80	1.70	.74
100	144000	....	....	....	....	....	....	89.70	39.00	21.75	9.46	7.36	3.20	3.01	1.31
125	180000	....	....	....	....	....	....	....	....	34.27	14.90	11.24	4.89	4.57	1.99
150	216000	....	....	....	....	....	....	....	....	48.76	21.20	16.10	7.00	6.55	2.85
175	252000	....	....	....	....	....	....	....	....	64.63	28.10	21.75	9.46	8.85	3.85
200	288000	....	....	....	....	....	....	....	....	86.25	37.50	28.68	12.47	11.54	5.02
250	360000	....	....	....	....	....	....	....	....	....	....	45.21	19.66	17.84	7.76
300	432000	....	....	....	....	....	....	....	....	....	....	64.53	28.06	25.76	11.20
350	504000	....	....	....	....	....	....	....	....	....	....	....	....	34.96	15.20
400	576000	....	....	....	....	....	....	....	....	....	....	....	....	44.85	19.50
450	648000	....	....	....	....	....	....	....	....	....	....	....	....	57.50	25.00
500	720000	....	....	....	....	....	....	....	....	....	....	....	....	70.84	30.80

Frictional heads at given rates of discharge in clean cast iron pipes for each 1000 feet of length.

U. S. Gal. per Minute	U. S. Gal. per 24 Hours	4 In. Pipe		5 In. Pipe		6 In. Pipe		8 In. Pipe		10 In. Pipe		12 In. Pipe		14 In. Pipe	
		Friction hd		Friction hd		Friction hd		Friction hd		Friction hd		Friction hd		Friction hd	
		Feet	Lbs.	Feet	Lbs.	Feet	Lbs.	Feet	Lbs.	Feet	Lbs.	Feet	Lbs	Feet	Lbs.
50	72000	2.01	.87	.67	.29	.32	.14	....	....	....	....	....	....	....	....
100	144000	7.36	3.19	2.61	1.14	1.08	.47	....	....	....	....	....	....	....	....
125	180000	12.19	5.30	4.07	1.77	1.68	.73	....	....	....	....	....	....	....	....
150	216000	16.05	6.95	5.36	2.34	2.28	.99	....	....	....	....	....	....	....	....
200	288000	28.09	12.17	10.32	4.48	3.92	1.70	1.01	.44	....	....	....	....	....	....
250	360000	43.47	18.83	16.24	7.08	6.00	2.60	1.52	.66	....	....	....	....	....	....
300	432000	62.20	26.94	23.40	10.20	8.52	3.69	2.13	.92	.75	.32	....	....	....	....
400	516000	109.68	47.50	42.52	18.52	14.89	6.45	3.68	1.59	1.27	.55	....	....	....	....
500	720000	170.53	73.87	64.90	28.20	23.01	9.97	5.64	2.44	1.93	.84	.81	.35	.40	.17
600	864000	....	....	90.20	39.30	32.89	14.25	8.03	3.48	2.72	1.18	1.14	.49	.55	.24
700	1008000	....	....	126.90	55.10	44.54	19.08	10.83	4.69	3.66	1.58	1.52	.66	.73	.32
800	1152000	....	....	....	....	57.95	25.10	14.05	6.08	4.73	2.05	1.96	.85	.94	.41
900	1290000	....	....	....	....	73.12	31.67	17.68	7.69	5.93	2.57	2.45	1.06	1.17	.51
1000	1440000	....	....	....	....	90.05	38.99	21.74	9.41	7.28	3.15	3.00	1.30	1.43	.62
1200	1728000	....	....	....	....	....	....	31.10	13.47	10.38	4.50	4.26	1.85	2.02	.88
1400	2016000	....	....	....	....	....	....	42.13	18.25	14.02	6.07	5.74	2.49	2.72	1.18
1600	2304000	....	....	....	....	....	....	54.84	23.75	18.22	7.89	7.44	3.22	3.51	1.52
1800	2592000	....	....	....	....	....	....	69.22	29.98	22.96	9.95	9.36	4.06	4.41	1.91
2000	2880000	....	....	....	....	....	....	85.27	36.93	28.25	12.34	11.50	5.00	5.41	2.34
2500	3600000	....	....	....	....	....	....	....	....	43.87	19.00	17.82	7.72	8.35	3.62
3000	4320000	....	....	....	....	....	....	....	....	62.92	27.25	25.51	11.05	11.93	5.17
3500	5040000	....	....	....	....	....	....	....	....	....	....	34.58	14.98	16.14	6.99
4000	5760000	....	....	....	....	....	....	....	....	....	....	....	....	21.00	9.10
4500	6480000	....	....	....	....	....	....	....	....	....	....	....	....	26.49	11.47

Friction of Water in Cast Iron Pipes—(Continued)

Frictional heads at given rates of discharge in clean cast iron pipes for each 1000 feet of length.

U. S. Gal. per Minute	U. S. Gal. per 24 Hours	16 In. Pipe		18 In. Pipe		20 In. Pipe		24 In. Pipe		30 In, pipe		36 In, Pipe		42 In. Pipe	
		Friction hd		Friction hd		Friction hd		Friction hd		Friction hd		Friction hd		Friction hd	
		Feet	Lbs.	Feet	Lbs.	Feet	Lbs.	Feet	Lbs.	Feet	Lbs.	Feet	Lbs.	Feet	Lbs.
500	720000	.22	.09	....	....	....	....	....	....	....	....	....	....	....	....
1000	1440000	.76	.34	.44	.19	....	....	....	....	....	....	....	....	....	....
1500	2160000	1.63	.71	.93	.40	.56	.24	....	....	....	....	....	....	....	....
2000	2880000	2.28	1.22	1.60	.69	.96	.42	.41	.18	....	....	....	....	....	....
2500	3600000	4.34	1.88	2.45	1.06	1.47	.64	.62	.27	....	....	....	....	....	....
3000	4320000	6.19	2.68	3.48	1.51	2.09	.90	.87	.38	.30	.13	....	....	....	....
3500	5040000	8.37	3.63	4.70	2.03	2.81	1.22	1.16	.50	.40	.17	....	....	....	....
4000	5760000	10.87	4.71	6.09	2.64	3.64	1.58	1.50	.65	.52	.22	....	....	....	....
4500	6480000	13.70	5.93	7.67	3.32	4.58	1.98	1.88	.82	.64	.28	....	....	....	....
5000	7200000	16.85	7.30	9.43	4.08	5.62	2.44	2.31	1.00	.78	.34	.33	.14	....	....
6000	8640000	....	....	13.49	5.84	8.03	3.48	3.28	1.42	1.11	.48	.46	.20	....	....
7000	10080000	....	....	....	....	10.86	4.71	4.43	1.92	1.49	.65	.62	.27	....	....
8000	11520000	....	....	....	....	....	....	5.75	2.49	1.93	.84	.80	.35	....	....
9000	12960000	....	....	....	....	....	....	7.25	3.14	2.43	1.05	1.00	.43	....	....
10000	14400000	....	....	....	....	....	....	....	....	2.98	1.29	1.23	.53	.63	.27
11000	15840000	....	....	....	....	....	....	....	....	3.59	1.55	1.47	.64	.76	.33
12000	17280000	....	....	....	....	....	....	....	....	4.25	1.84	1.74	.75	.91	.40
13000	18720000	....	....	....	....	....	....	....	....	4.97	2.15	2.03	.88	1.09	.47
14000	20160000	....	....	....	....	....	....	....	....	5.75	2.49	2.35	1.02	1.25	.54
15000	21600000	....	....	....	....	....	....	....	....	6.58	2.85	2.69	1.17	1.43	.62
16000	23040000	....	....	....	....	....	....	....	....	....	....	3.04	1.32	1.62	.71
17000	24480000	....	....	....	....	....	....	....	....	....	....	3.43	1.49	1.84	.80
18000	25920000	....	....	....	....	....	....	....	....	....	....	3.83	1.66	2.07	.90
20000	28800000	....	....	....	....	....	....	....	....	....	....	4.71	2.04	2.55	1.11

Friction of Water in Elbows

PRESSURE IN POUNDS PER SQUARE INCH TO BE ADDED FOR EACH ELBOW

Gallons per Min. Delivered	PIPE SIZES															
	¾	1	1¼	1½	2	2½	3	3½	4	5	6	7	8	9	10	12
5	.07	.027	.008	.005	.002	....	....	....	....	....	....	....	....	....	....	....
10	.28	.094	.031	.018	.006	.003	....	....	....	....	....	....	....	....	....	....
15	.63	.212	.069	.04	.014	.005	....	....	....	....	....	....	....	....	....	....
20	1.12	.376	.123	.069	.025	.012	.005	....	....	....	....	....	....	....	....	....
25	1.74	.585	.194	.108	.038	.02	.008	....	....	....	....	....	....	....	....	....
30	....	.845	.278	.157	.055	.028	.011	....	....	....	....	....	....	....	....	....
35	....	1.15	.380	.215	.076	.037	.015	.009	....	....	....	....	....	....	....	....
40	....	1.50	.495	.278	.098	.049	.02	.011	.007	....	....	....	....	....	....	
45	....	1.90	.626	.352	.125	.062	.026	.015	.009	....	....	....	....	....	....	
50	....	....	.77	.43	.153	.08	.032	.017	.01	....	....	....	....	....	....	
60	....	3.38	1.11	.62	.22	.112	.044	.026	.015	.006	.003	....	....	....	....	
70	....	4.60	1.52	.86	.304	.148	.06	.035	.021	.009	.004	.002	....	....	....	
75	....	5.30	1.74	.98	.35	.172	.072	.04	.024	.01	.005	.003	....	....	....	
80	....	6.00	1.98	1.11	.392	.196	.08	.044	.027	.012	.005	.003	....	....	....	
90	....	7.60	2.50	1.41	.50	.248	.104	.06	.035	.014	.007	.004	....	....	....	
100	....	....	3.08	1.72	.612	.32	.128	.068	.043	.017	.008	.005	.003	.002	....	....
125	....	....	....	2.72	.97	.48	.20	.112	.067	.027	.013	.007	.004	.003	.002	....
150	....	....	....	3.92	1.39	.685	.286	.16	.096	.039	.019	.01	.006	.004	.003	.001
175	....	....	....	5.32	1.90	.935	.390	.218	.132	.053	.026	.014	.009	.005	.004	.002
200	....	....	....	6.88	2.44	1.28	.512	.272	.172	.068	.032	.02	.011	.007	.005	.002
250	....	....	....	....	3.86	1.91	.80	.446	.268	.109	.025	.029	.017	.011	.007	.004
300	....	....	....	....	5.56	2.74	1.14	.64	3.84	.156	.076	.042	.025	.016	.01	.005
350	....	....	....	....	....	3.77	1.58	.88	.530	.215	.103	.057	.034	.022	.014	.007
400	....	....	....	....	....	5.12	2.05	1.09	.688	.272	.128	.08	.044	.028	.018	.009
450	....	....	....	....	....	6.20	2.58	1.45	.870	.352	.170	.094	.057	.036	.023	.011
500	....	....	....	....	....	7.64	3.20	1.78	1.07	.436	.208	.116	.068	.044	.028	.016
750	....	....	....	....	....	....	....	....	2.42	.970	.470	.260	.156	.10	.063	.031
1000	....	....	....	....	....	....	....	....	4.28	1.74	.832	.464	.272	.176	.112	.064
1250	....	....	....	....	....	....	....	....	6.70	2.71	1.31	.728	.435	.276	.175	.086
1500	....	....	....	....	....	....	....	....	9.68	3.88	1.88	.84	.624	.40	.252	.124

Friction Loss in Pounds Pressure

Friction loss in pounds pressure per square inch for each 100 foot length in different size clean iron pipe, discharging given quantities per minute.

Gallons per Min.	SIZES OF PIPES—INSIDE DIAMETER.																	
	¾ in.	1 in.	1¼ in.	1½ in.	2 in.	2½ in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	10 in.	12 in.	14 in.	16 in.	18 in.	20 in.
5	3.3	.84	.31	.12	.03	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
10	13.0	3.16	1.05	.47	.12	.03	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
15	28.7	6.98	2.38	.97	.27	.06	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
20	50.4	12.3	4.07	1.66	.42	.13	.03	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
25	78.0	19.0	6.40	2.62	.67	.21	.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
30	.....	27.5	9.15	3.75	.91	.30	.12	.03	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
35	.....	37.0	12.4	5.05	1.26	.42	.14	.05	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
40	.....	48.0	16.1	6.52	1.60	.51	.17	.06	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
45	.....	.....	20.2	8.15	2.01	.62	.27	.07	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
50	.....	.....	24.9	10.0	2.44	.81	.35	.09	.03	.....	.....	.....	.....	.....	.....	.....	.....	.....
75	.....	.....	56.1	22.4	5.32	1.80	.74	.21	.06	.03	.....	.....	.....	.....	.....	.....	.....	.....
100	.....	.....	.....	39.0	9.46	3.20	1.31	.33	.12	.05	.....	.....	.....	.....	.....	.....	.....	.....
125	.....	.....	.....	.....	14.9	4.89	1.99	.51	.17	.07	.....	.....	.....	.....	.....	.....	.....	.....
150	.....	.....	.....	.....	21.2	7.0	2.85	.69	.25	.10	.....	.02	.....	.....	.....	.....	.....	.....
175	.....	.....	.....	.....	28.1	9.46	3.85	.95	.34	.14	.....	.03	.....	.....	.....	.....	.....	.....
200	.....	.....	.....	.....	37.5	12.47	5.02	1.22	.42	.17	.08	.05	.01	.....	.....	.....	.....	.....
250	.....	.....	.....	.....	.....	19.66	7.76	1.89	.65	.26	.13	.07	.03	.01	.....	.....	.....	.....
300	.....	.....	.....	.....	.....	28.06	11.2	2.66	.93	.37	.18	.09	.04	.....	.....	.....	.....	.....
350	.....	.....	.....	.....	.....	.....	15.2	3.65	1.28	.50	.25	.12	.05	.02	.....	.....	.....	.....
400	.....	.....	.....	.....	.....	.....	19.5	4.73	1.68	.65	.32	.16	.06	.....	.....	.....	.....	.....
450	.....	.....	.....	.....	.....	.....	25.	6.01	2.10	.81	.42	.20	.07	.03	.....	.....	.....	.....
500	.....	.....	.....	.....	.....	.....	30.8	7.43	2.70	.96	.49	.25	.09	.04	.017	.009	.005	.....
600	.....	.....	.....	.....	.....	.....	.....	10.6	3.45	1.72	.86	.348	.13	.05	.24	.....	.....	.....
750	.....	.....	.....	.....	.....	.....	.....	.....	5.40	2.21	1.11	.53	.18	.08	.038	.....	.....	.....
1000	.....	.....	.....	.....	.....	.....	.....	.....	9.60	3.88	1.91	.94	.32	.13	.062	.036	.02	.012
1250	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.46	.49	.20	.....	.....	.....	.....
1500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.09	.70	.29	.135	.071	.040	.....
1750	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.95	.38	.....	.....	.....	.....
2000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.23	.49	.234	.123	.071	.042
2500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.77	.362	.188	.107	.....
3000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.11	.515	.267	.15	.091
3500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.697	.365	.204	.124
4000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.91	.472	.264	.158
4500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.593	.33	.200
5000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.730	.41	.244
*	$\sqrt{5}$	1	1.75	2.76	5.66	9.88	15.59	32	55.9	88.2	129.6	181.	316.2	498.8	733.4	1024	1375	1760

*** Comparative Discharging Power of Pipes**

Remember, **doubling** the quantity of water forced through a line **doubles** the **velocity** and makes **four times the friction.**

In figuring friction of water in elbows, assume five ordinary elbows the equivalent of 100 feet of straight pipe.

One pound of pressure is the same as the pressure of water 2.3 feet high.

Capacities, in U. S. Gallons, of Cylinders of Various Diameters and Lengths

Diam. Inches	LENGTH OF CYLINDER																		Diam. Inches
	1″	1′	5′	6′	7′	8′	9′	10′	11′	12′	13′	14′	15′	16′	17′	18′	20′	22′	24′	
1	.....	0.04	0.20	0.24	0.28	0.32	0.36	0.40	0.44	0.48	0.52	0.56	0.60	0.64	0.68	0.72	0.80	0.88	0.96	1
2	0.01	0.16	0.80	0.96	1.12	1.28	1.44	1.60	1.76	1.92	2.08	2.24	2.40	2.56	2.72	2.88	3.20	3.52	3.84	2
3	0.03	0.37	1.84	2.20	2.56	2.92	3.30	3.68	4.04	4.40	4.76	5.12	5.48	5.84	6.22	6.60	7.36	8.08	8.80	3
4	0.05	0.65	3.26	3.92	4.58	5.24	5.88	6.52	7.18	7.84	8.50	9.16	9.82	10.5	11.1	11.8	13.0	14.4	15.7	4
5	0.06	1.02	5.10	6.12	7.14	8.16	9.18	10.2	11.2	12.2	13.3	14.3	15.3	16.3	17.3	18.4	20.4	22.4	24.4	5
6	0.12	1.47	7.34	8.80	10.3	11.8	13.2	14.7	16.1	17.6	19.1	20.6	22.0	23.6	25.0	26.4	29.4	32.2	35.2	6
7	0.17	2.00	10.0	12.0	14.0	16.0	18.0	20.0	22.0	24.0	26.0	28.0	30.0	32.0	34.0	36.0	40.0	44.0	48.0	7
8	0.22	2.61	13.0	15.6	18.2	20.8	23.4	26.0	28.6	31.2	33.8	36.4	39.0	41.6	44.2	46.8	52.0	57.2	62.4	8
9	0.28	3.31	16.5	19.8	23.1	26.4	29.8	33.0	36.4	39.6	43.0	46.2	49.6	52.8	56.2	60.0	66.0	72.4	79.2	9
10	0.34	4.08	20.4	24.4	28.4	32.6	36.8	40.8	44.8	48.8	52.8	56.8	61.0	65.2	69.4	73.6	81.6	89.6	97.6	10
11	0.41	4.94	24.6	29.6	34.6	39.4	44.4	49.2	54.2	59.2	64.2	69.2	74.0	78.8	83.8	88.8	98.4	104.	118.	11
12	0.49	5.88	29.4	35.2	41.0	46.8	52.8	58.8	64.6	70.4	76.2	82.0	87.8	93.6	99.6	106.	118.	129.	142.	12
13	0.57	6.90	34.6	41.6	48.6	55.2	62.2	69.2	76.2	83.2	90.2	97.2	104.	110.	117.	124.	138.	152.	166.	13
14	0.67	8.00	40.0	48.0	56.0	64.0	72.0	80.0	88.0	96.0	104.	112.	120.	128.	136.	144.	160.	176.	192.	14
15	0.77	9.18	46.0	55.2	64.4	73.6	82.8	92.0	101.	110.	120.	129.	138.	147.	156.	166.	184.	202.	221.	15
16	0.87	10.4	52.0	62.4	72.8	83.2	93.6	104.	114.	125.	135.	146.	156.	166.	177.	187.	208.	229.	250.	16
17	0.98	11.8	59.0	70.8	81.6	94.4	106.	118.	130.	142.	153.	163.	177.	189.	201.	212.	236.	260.	283.	17
18	1.10	13.2	66.0	79.2	92.4	106.	119.	132.	145.	158.	172.	185.	198.	211.	224.	240.	264.	290.	317.	18
19	1.23	14.7	73.6	88.4	103.	118.	132.	147.	162.	177.	192.	206.	221.	235.	250.	265.	294.	324.	354.	19
20	1.36	16.3	81.6	98.0	114.	130.	147.	163.	180.	198.	212.	229.	245.	261.	277.	294.	326.	359.	396.	20
21	1.50	18.0	90.0	108.	126.	144.	162.	180.	198.	216.	238.	252.	270.	288.	306.	324.	360.	396	432.	21
22	1.65	19.8	99.0	119.	139.	158.	178.	198.	218.	238.	257.	277.	297.	317.	337.	356.	396.	436.	476.	22
23	1.80	21.6	108.	130.	151.	173.	194.	216.	238.	259.	281.	302.	324.	346.	367.	389.	432.	476.	518.	23
24	1.96	23.5	118.	141.	165.	188.	212.	235.	259.	282.	306.	330.	353.	376.	400.	424.	470.	518.	564.	24
25	2.12	25.5	128.	153.	179.	204.	230.	255.	281.	306.	332.	358.	383.	408.	434.	460.	510.	562.	612.	25
26	2.30	27.6	138.	166.	193.	221.	248.	276.	304.	331.	359.	386.	414.	442.	470.	496.	552.	608.	662.	26
27	2.48	29.7	148.	178.	208.	238.	267.	297.	326.	356.	386.	416.	426.	476.	504.	534.	594.	652.	712.	27
28	2.67	32.0	160.	192.	224.	256.	288.	320.	352.	384.	416.	448.	480.	512.	544.	576.	640	704.	768.	28
29	2.86	34.3	171.	206.	240.	274.	309.	343.	377.	412.	446.	480.	514.	548.	584.	618.	686.	754.	824.	29
30	3.06	36.7	183.	220.	257.	294.	330.	367.	404.	440.	476.	514.	550.	588.	624.	660.	734.	808.	880.	30
32	3.44	41.8	209.	251.	293.	334.	376.	418.	460.	502.	544.	586.	628.	668.	710.	752.	836.	920.	1004.	32
34	3.93	47.2	236.	283.	330.	378.	424.	472.	520.	566.	614.	660.	708.	756.	802.	848.	944.	1040.	1132.	34
36	4.41	52.9	264.	317.	370.	422.	476.	528.	582.	634.	688.	740.	792.	844.	898.	952.	1056.	1164.	1268.	36

Wrought Pipe.

FULL STANDARD WEIGHT–BLACK AND GALVANIZED

ALL WEIGHTS AND DIMENSIONS ARE NOMINAL

Size	List Price per Foot	Diameters		Thickness	Weight per Foot		Threads per Inch
		External	Internal		Plain Ends	Threads and Couplings	
⅛	$ .05½	.405	.269	.068	.244	.245	27
¼	.06	.540	.364	.088	.424	.425	18
⅜	.06	.675	.493	.091	.567	.568	18
½	.08½	.840	.622	.109	.850	.852	14
¾	.11½	1.050	.824	.113	1.130	1.134	14
1	.17	1.315	1.049	.133	1.678	1.684	11½
1¼	.23	1.660	1.380	.140	2.272	2.281	11½
1½	.27½	1.900	1.610	.145	2.717	2.731	11½
2	.37	2.375	2.067	.154	3.652	3.678	11½
2½	.58½	2.875	2.469	.203	5.793	5.819	8
3	.76½	3.500	3.068	.216	7.575	7.616	8
3½	.92	4.000	3.548	.226	9.109	9.202	8
4	1.09	4.500	4.026	.237	10.790	10.889	8
4½	1.27	5.000	4.506	.247	12.538	12.642	8
5	1.48	5.563	5.047	.258	14.617	14.810	8
6	1.92	6.625	6.065	.280	18.974	19.185	8
7	2.38	7.625	7.023	.301	23.544	23.769	8
8	2.50	8.625	8.071	.277	24.696	25.000	8
8	2.88	8.625	7.981	.322	28.554	28.809	8
9	3.45	9.625	8.941	.342	33.907	34.188	8
10	3.20	10.750	10.192	.279	31.201	32.000	8
10	3.50	10.750	10.136	.307	34.240	35.000	8
10	4.12	10.750	10.020	.365	40.483	41.132	8
11	4.63	11.750	11.000	.375	45.557	46.247	8
12	4.50	12.750	12.090	.330	43.773	45.000	8
12	5.07	12.750	12.000	.375	49.562	50.706	8
13	5.60	14.000	13.250	.375	54.568	55.824	8
14	6.10	15.000	14.250	.375	58.573	60.375	8
15	6.50	16.000	15.250	.375	62.579	64.500	8

The permissible variation in weight is 5 per cent above and 5 per cent below.

Courtesy of National Tube Co.

Wrought Pipe.

EXTRA STRONG PIPE—DOUBLE EXTRA STRONG PIPE
FULL STANDARD WEIGHT

EXTRA STRONG PIPE—BLACK AND GALVANIZED

ALL WEIGHTS AND DIMENSIONS ARE NOMINAL

Size	List Price per Foot	Diameters		Thickness	Weight per Foot Plain Ends
		External	Internal		
⅛	$ .12	.405	.215	.095	.314
¼	.07½	.540	.302	.119	.535
⅜	.07½	.675	.423	.126	.738
½	.11	.840	.546	.147	1.087
¾	.15	1.050	.742	.154	1.473
1	.22	1.315	.957	.179	2.171
1¼	.30	1.660	1.278	.191	2.996
1½	.36½	1.900	1.500	.200	3.631
2	.50½	2.375	1.939	.218	5.022
2½	.77	2.875	2.323	.276	7.661
3	1.03	3.500	2.900	.300	10.252
3½	1.25	4.000	3.364	.318	12.505
4	1.50	4.500	3.826	.337	14.983
4½	1.80	5.000	4.290	.355	17.611
5	2.08	5.563	4.813	.375	20.778
6	2.86	6.625	5.761	.432	28.573
7	3.81	7.625	6.625	.500	38.048
8	4.34	8.625	7.625	.500	43.388
9	4.90	9.625	8.625	.500	48.728
10	5.48	10.750	9.750	.500	54.735
11	6.10	11.750	10.750	.500	60.075
12	6.55	12.750	11.750	.500	65.415

The permissible variation in weight is 5 per cent above and 5 per cent below.

DOUBLE EXTRA STRONG PIPE—BLACK AND GALVANIZED

ALL WEIGHTS AND DIMENSIONS ARE NOMINAL

Size	List price per foot	Diameters		Thickness	Weight per Foot Plain Ends
		External	Internal		
½	$ .32	.840	.252	.294	1.714
¾	.35	1.050	.434	.308	2.440
1	.37	1.315	.599	.358	3.659
1¼	.52½	1.660	.896	.382	5.214
1½	.65	1.900	1.100	.400	6.408
2	.91	2.375	1.503	.436	9.029
2½	1.37	2.875	1.771	.552	13.695
3	1.86	3.500	2.300	.600	18.583
3½	2.30	4.000	2.728	.636	22.850
4	2.76	4.500	3.152	.674	27.541
4½	3.26	5.000	3.580	.710	32.530
5	3.86	5.563	4.063	.750	38.552
6	5.32	6.625	4.897	.864	53.160
7	6.35	7.625	5.875	.875	63.079
8	7.25	8.625	6.875	.875	72.424

The permissible variation in weight is 10 per cent above and 10 per cent below.

Comparative Table of Pipe Capacities

Number of Smaller Pipes Equivalent to One Larger

With the same velocity of flow, the volume delivered by two pipes of different sizes is proportional to the squares of their diameters. With the same head or pressure, however, the velocity is less in the smaller pipe and the volume delivered varies about as the square root of the 5th power. The table is calculated on this basis, the figures in each column showing the number of pipes of the size at the head of that column, equivalent in capacity to one pipe of the corresponding sizes given in side columns.

Large Pipe, Diam., Ins.	Smaller Pipes, Diameters, Inches															Large Pipe, Diam. Ins.
	1	2	3	4	5	6	7	8	9	10	12	14	16	18	20	
	Number to Give Same Capacity as One Large Pipe															
2	5.7	......	......	......	......	......	......	......	......	......	......	......	......	......	......	2
3	15.6	2.8	......	......	......	......	......	......	......	......	......	......	......	......	......	3
4	32.0	5.7	2.1	......	......	......	......	......	......	......	......	......	......	......	......	4
5	55.9	9.9	3.6	1.7	......	......	......	......	......	......	......	......	......	......	......	5
6	88.2	15.6	5.7	2.8	1.6	......	......	......	......	......	......	......	......	......	......	6
7	130	22.9	8.3	4.1	2.3	1.5	......	......	......	......	......	......	......	......	......	7
8	181	32.0	11.7	5.7	3.2	2.1	1.4	......	......	......	......	......	......	......	......	8
9	243	43.0	15.6	7.6	4.3	2.8	1.9	1.3	......	......	......	......	......	......	......	9
10	316	55.9	20.3	9.9	5.7	3.6	2.4	1.7	1.3	......	......	......	......	......	......	10
11	401	70.9	25.7	12.5	7.2	4.6	3.1	2.2	1.7	1.3	......	......	......	......	......	11
12	499	88.2	32.0	15.6	8.9	5.7	3.8	2.8	2.1	1.6	......	......	......	......	......	12
13	609	108	39.1	19.0	10.9	7.1	4.7	3.4	2.5	1.9	1.2	......	......	......	......	13
14	733	130	47.0	22.9	13.1	8.3	5.7	4.1	3.0	2.3	1.5	......	......	......	......	14
15	871	154	55.9	27.2	15.6	9.9	6.7	4.8	3.6	2.8	1.7	1.2	......	......	......	15
16	......	181	65.7	32.0	18.3	11.7	7.9	5.7	4.2	3.2	2.1	1.4	......	......	......	16
17	......	211	76.4	37.2	21.3	13.5	9.2	6.6	4.9	3.8	2.4	1.6	1.2	......	......	17
18	......	243	82.2	43.0	24.6	15.6	10.6	7.6	5.7	4.3	2.8	1.9	1.3	......	......	18
20	......	316	115	55.9	32.0	20.3	13.8	9.9	7.4	5.7	3.6	2.4	1.7	1.3	......	20
22	......	401	146	70.9	40.6	25.7	17.5	12.5	9.3	7.2	4.6	3.1	2.2	1.7	1.3	22
24	......	499	181	88.2	50.5	32.0	21.8	15.6	11.6	8.9	5.7	3.8	2.8	2.1	1.6	24

FLOW OF WATER IN PIPES

From "Book of Standards," (National Tube Company) 1913 Edition, Pages 277, 278, and 279.

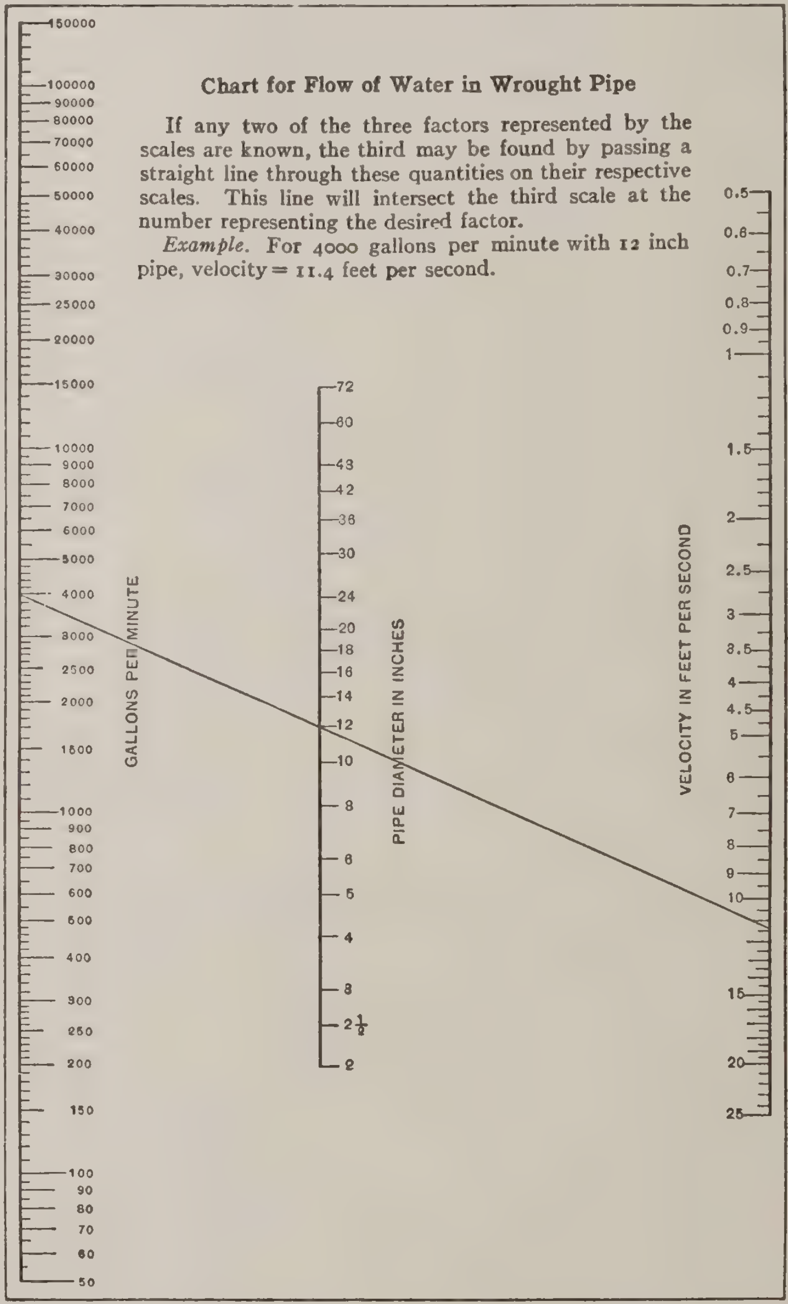


Chart for Flow of Water in Wrought Pipe

If any two of the three factors represented by the scales are known, the third may be found by passing a straight line through these quantities on their respective scales. This line will intersect the third scale at the number representing the desired factor.

Example. For 4000 gallons per minute with 12 inch pipe, velocity = 11.4 feet per second.

The quantity of water discharged through a pipe depends on the head. If the discharge occurs freely into the air, this head is the difference in level between the surface of the water in the reservoir and the center of the discharge end of the pipe; if the lower end of the pipe is submerged, the head is the difference in elevation between the two water levels. The discharge for a given diameter depends also upon the length of the pipe, upon the character of its interior surface as to smoothness and upon the number and sharpness of its bends.

The head, instead of being an actual distance between levels, may be caused by pressure, as by pumping, in which case the head is calculated as a vertical distance corresponding to the pressure, 1 pound per square inch being equal to 2.309 feet head, or 1 foot head being equal to a pressure of 0.433 pound per square inch.

The total head operating to cause flow is divided into three parts: (1) the velocity head, which is the height through which a body must fall in a vacuum to acquire the velocity with which the water flows in the pipe. This is equal to $v^2 \div 2g$, in which v is the velocity in feet per second, and $2g = 64.32$. (2) The entry head, which is required to overcome the resistance to entrance to the pipe. With sharp-edged entrance the entry head equals about one-half of the velocity head; with smooth, rounded entrance the entry head is inappreciable; (3) the friction head, due to the frictional resistance to flow in the pipe.

In ordinary cases of pipes of considerable length the sum of the entry and velocity heads scarcely exceeds one foot; in the case of long pipes with low heads it is so small that it may be neglected.

When the flow becomes steady, the pipe is entirely filled throughout its length, and hence the mean velocity at any section is the same as that at the end, when the size is uniform. This velocity is found to decrease as the length of the pipe increases, other things being equal, and becomes very small for great lengths, which shows that nearly all the head has been lost in overcoming the resistances. The length of the pipe is measured along its axis, following all the curves, if there be any. The velocity considered is the mean velocity, which is equal to the discharge divided by the area of the cross section of the pipe. The actual velocities in the cross section are greater than this mean velocity near the center and less than it near the interior surface of the pipe.

The object of the discussion of flow in pipes is to enable the discharge which will occur under given conditions to be determined, or to ascertain the proper size which a pipe should have in order to deliver a given discharge. The subject cannot, however, be developed with the definiteness which characterizes the flow from orifices and weirs, partly because the condition of the interior surface of the pipe greatly modifies the discharge, partly because of the lack of experimental data, and partly on account of defective theoretical knowledge regarding the laws of flow. In orifices and weirs errors of two or three per cent may be regarded as large with careful work; in pipes such errors are common and are generally exceeded in most practical investigations.

It fortunately happens, however, that in most cases of the design of systems of pipes errors of five and ten per cent are not important, although they are of course to be avoided if possible, or, if not avoided, they should occur on the side of safety.

Quantity of Water Discharged

The quantity of water which flows through a pipe is the product of the area of its cross section and the mean velocity of flow. That is,

$$Q = av,$$

in which Q is the quantity discharged in cubic feet per second, a is the area in square feet and v is the velocity in feet per second.

For U. S. gallons per second multiply by	7.4805
For U. S. gallons per minute multiply by	448.83
For U. S. gallons per hour multiply by	26929.9
For U. S. gallons per 24 hours multiply by	646317.

The diagram above gives the discharge in gallons per minute when the velocity in the pipe line is known.

Allis-Chalmers Manufacturing Company

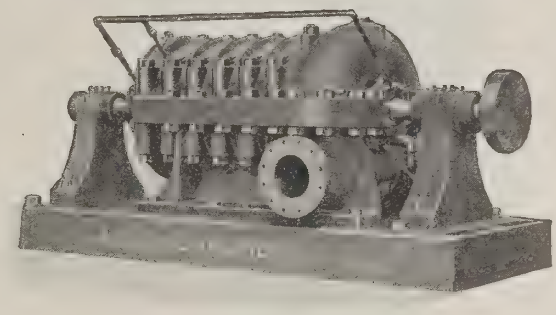
MILWAUKEE, WISCONSIN

Branch Offices in All Principal Cities

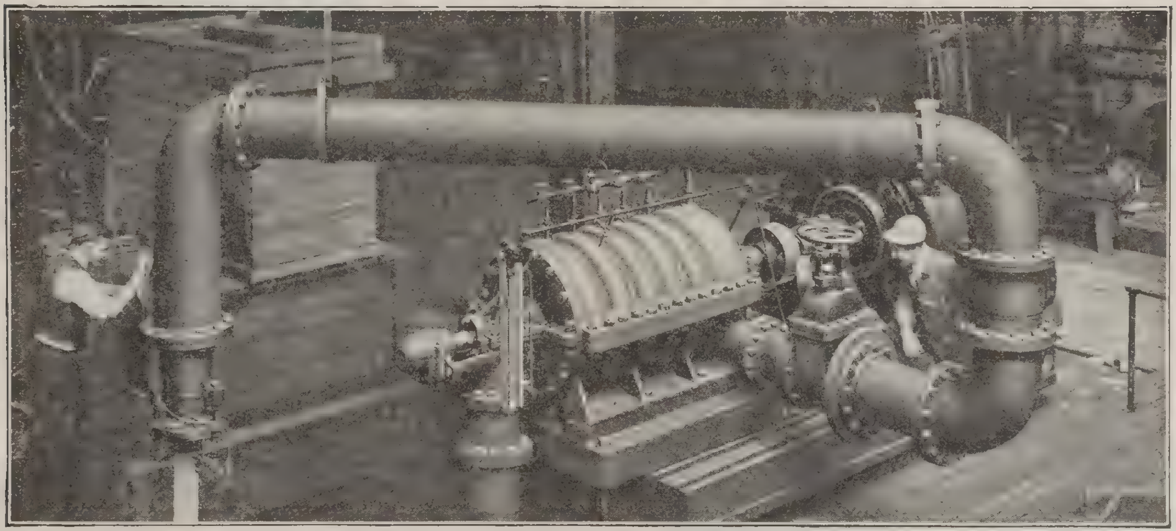
The Combined Unit Undivided Responsibility

Products

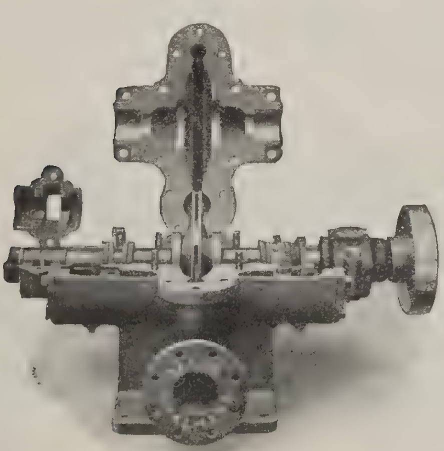
We build a complete line of Single and Multi-Stage, Cast Iron and Acid Bronze Centrifugal Mine Pumps, and Boiler Feed Pumps.



High Head Mine Pump installed for pumping 1000 gallons per minute against 1060 feet head. Pump is 8″ 6 stage of the split casing type, bronze fitted and direct connected to an Allis-Chalmers 400 H. P. induction motor.



Nozzle and Pitot Tube Test of Bronze Mine Pump.
This is an 8″ 6 Stage Pump of the Split Casing Type discharging 2000 gallons per minute against 300 feet head, and is direct connected to an Allis-Chalmers 250 H. P. direct curren motor.



The Type "S" is a Single Stage Pump with the casing split. A large number of these pumps have been installed in mines. Cast iron, bronze fitted. Pumps from 2″ to 20″ sizes inclusive are carried in stock, together with suitable Allis-Chalmers motors. Special Acid Resisting Bronze Pumps are also manufactured.

BULLETIN No. 1632-A WILL BE FORWARDED UPON REQUEST.

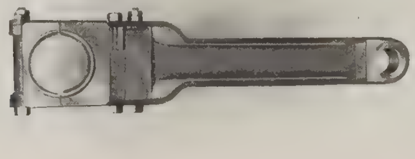
THE ALDRICH PUMP COMPANY

ALLENTOWN PENNA. U. S. A.

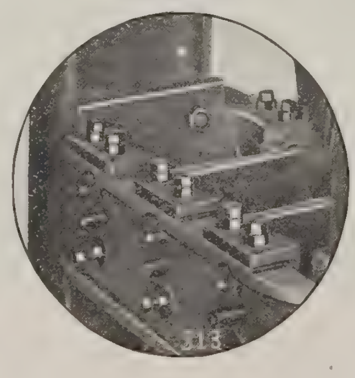
General Characteristics and Specifications of

Aldrich Mine Pumps

The connecting rods (Cut 135) are of the adjustable type with bronze boxes. A forged steel strap encircles the stub and bearing allowing adjustment of the boxes from one end by means of a wedge and screw, while the pump is running. The bearings are groved and ample provision is made for proper lubrication.

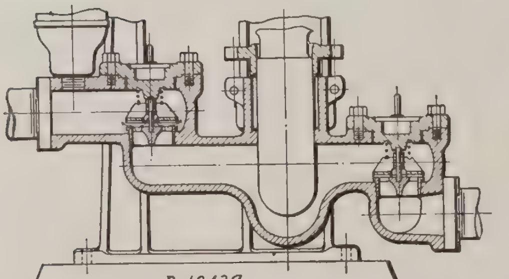


The cradle of cast iron is bolted between the main frames and carries the bored out adjustable ways for the crosshead. (Cut 313).

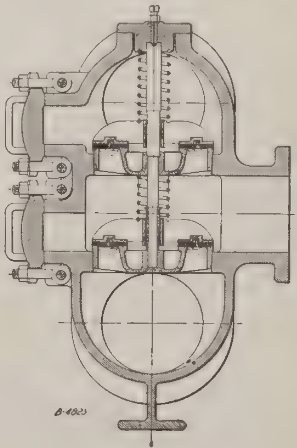


In the smaller sizes of horizontal pumps the main journals are cast in the main frames, but in the larger sizes of horizontal and all the vertical pumps, the main journals are separate from the main frames and are secured to them by heavy bearing caps accurately fitted to both. They are provided with babbitted bearings and can be adjusted by a wedge while the pump is running. (Cut 46-A.)

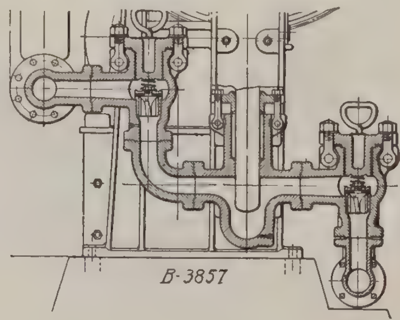
The Working Barrels and Valve Chambers are made of hard close grained cast iron of spherical and cylinderical construction which gives them the maximum strength for the thickness of metal. The working barrels are bolted between the main frames with turned bolts. The valve chambers contain the suction and discharge valves. Each valve has an independent cover held in position by heavy bolts. In the solid water end type (D-10429) the working barrel and valve chambers are in one casting and in the divided water end type the valves are all in one chamber (B-4825) which is bolted to the working barrel, while in the pot chamber type (B-3857) there is a separate chamber for each valve. These chambers are bolted to the working barrel and are connected by the suction and discharge pipes.



D-10429.



B-4825



B-3857

Fig. 136 and 139

The Pot Chamber Pump allows the use of a sectionalized water end, an arrangement which is considered one of the most essential in pump construction.

While this type is adapted for general pumping requirements, such as water works, paper mills, steel factories, etc., it is especially suited for mine service.

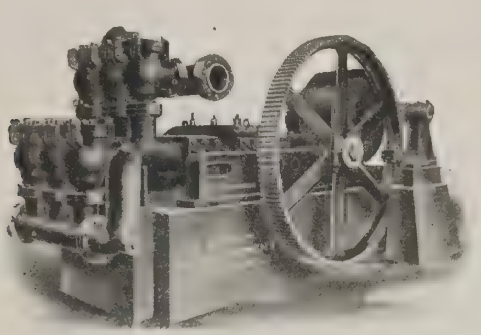


Figure 136
Horizontal Triplex Pot Chamber, Water End Type.
Write for Range of Operation

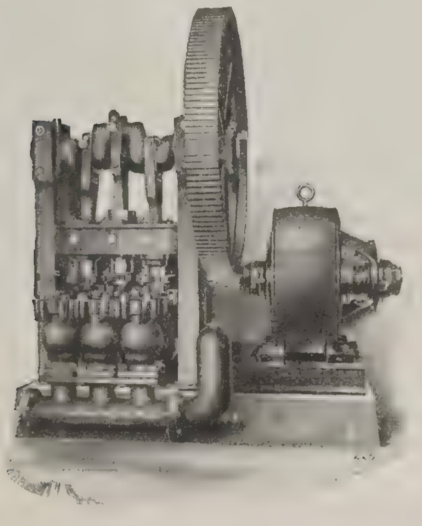


Figure 139
Vertical Triplex Pot Chamber, Water End Type.
Range of operation given in Pump Data No. 33.

Fig. 119

This type of pump is especially designed for working on slopes, incline shafts and for pumping out dips. It is fitted with trucks to suit mine tracks.

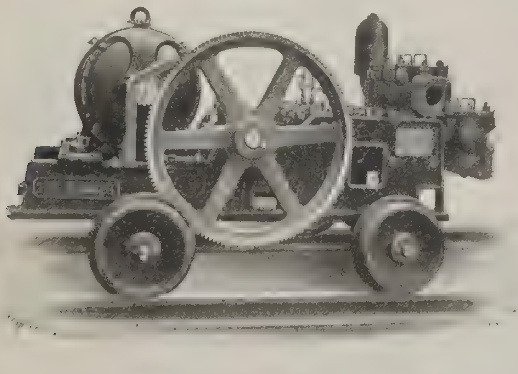


Figure 119
Horizontal Triplex Solid Water End Type, with Trucks.
Pump Data No. 34 gives range of operation.

Fig. 170

Where large quantities of water are to be pumped against low lifts the Divided water end type is recommended. Illustration shows this type of pump fitted with improved herringbone gear drive.

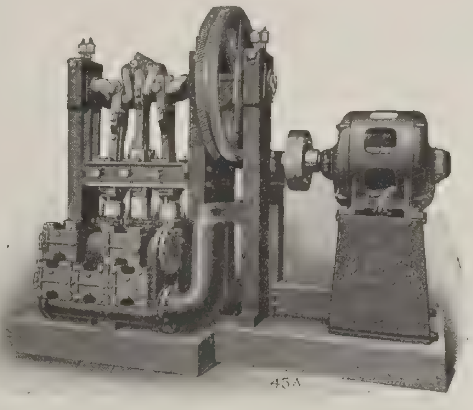


Figure 170
Vertical Triplex Divided Water End Type, with Outboard Standard.

Write for Pump Data No. 32 and full information covering this driving arrangement.

Figs. 146 and 164

For a permanent mine station where the water to be pumped is acidulous, the wood or cement lined pump is recommended. The entire water end is wood or cement lined, increasing the life of the parts against the action of the acid water.

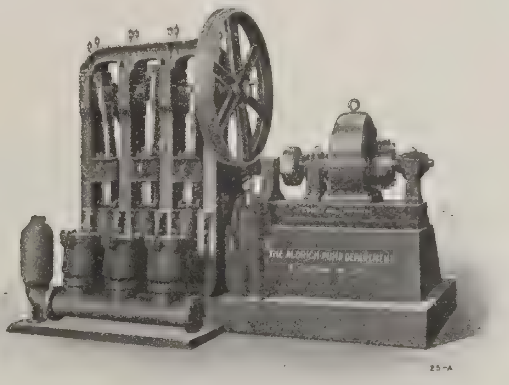


Figure 164
Vertical Triplex, Four Standard Pot Chamber Water End Type.

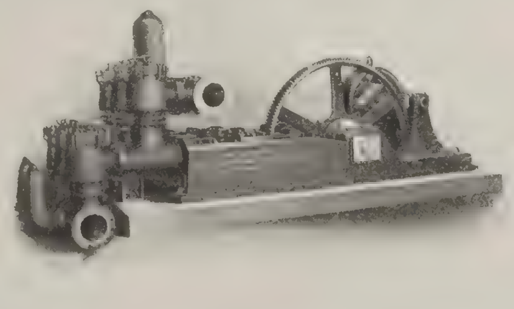


Figure 146
Horizontal Triplex, Four Standard, Wood Lined, Pot Chamber Water End Type.

AMERICAN STEAM PUMP CO.

BATTLE CREEK, MICHIGAN

New York Office: 17 Battery Place. MANUFACTURERS OF Chicago Office: 1220 Monadnock Block.

Marsh and American Steam and Power Driven Pumps and Air Compressors

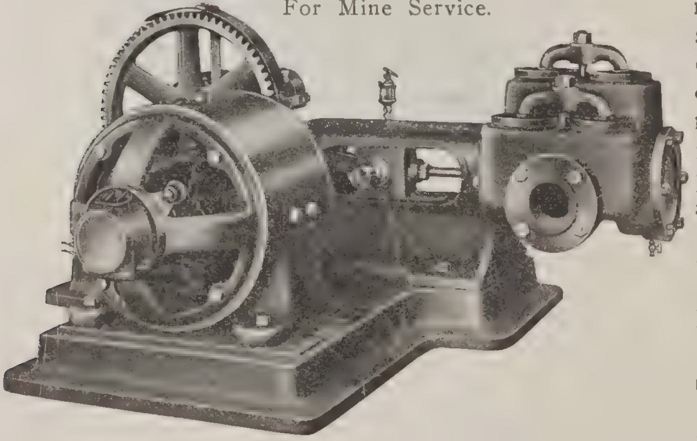
Represented by

DRAVO-DOYLE CO.

Pittsburg, Cleveland Indianapolis, Philadelphia

American Gathering or Dip Pump

For Mine Service.



A portable outfit especially designed for taking care of surplus water accumulating in the side sumps or pockets of mines.

Water end constructed of acid-proof metal.

Instant access to all water valves by simply loosening two nuts. This is very desirable when handling mine water in which small pieces of coal or other foreign matter are likely to clog the valves.

Specifications: The frame is of the heavy box type with the metal carefully distributed to best withstand the severe strains to which it is subjected. The crosshead guides are cylindrical and bearings are lined with genuine babbit and scraped to a true bearing. Connecting rod is of cast steel, crosshead end of solid type with brass boxes. Crank end of marine type with heavy studs and babbitt lined. Crosshead of box type with adjustable bronze shoes.

Pump end is equipped with removable acid-proof bushing. Valve areas are ample and water ways easy. Piston is connected to crosshead by solid acid proof rod.

A suitable sub-base is furnished, as shown in illustration, under both pump and motor.

Size, 5x6: Capacity, 60 gallons per minute; 3 inch suction, 2½ inch delivery. Code word, Dippy.

Size, 6x8: Capacity, 100 gallons per minute; 3½ inch suction, 3 inch delivery. Code word, Dipsop.

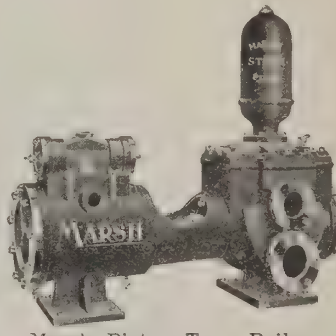
Note: When writing for prices on motor driven outfit, be sure to give the voltage and character of your current, i. e., whether direct or alternating, and if the latter, what cycle and phase.

Marsh and American Steam Pumps

Marsh and American Pumps are made both in the piston and outside center packed plunger patterns. They are fully bronze fitted at regular prices including solid bronze piston rods and cast bronze removable water cylinder bushings. They will not short-stroke, race or pound under the most severe conditions. The absence of outside valve motion on the Marsh Pump reduces the repair cost to a minimum and is especially recommended where it is necessary to employ cheap labor to care for the pump as the valve is set before leaving the factory and requires no adjustment. Marsh and American Pumps are guaranteed to operate on 25% less steam than any duplex pump on the market.

Power Pumps

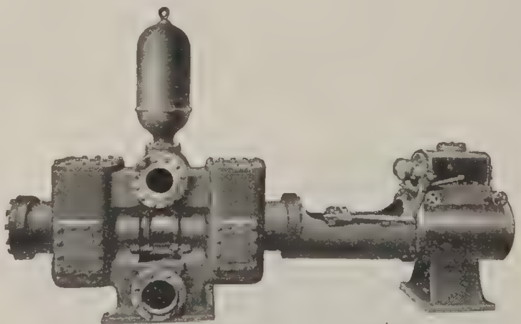
American single and duplex horizontal power pumps vary in capacity from 6 to 1,000 gallons per minute. They are made with the same high grade of material and workmanship which characterize Marsh and American steam pumps. They are simple in design and very rugged in construction. They are furnished with or without motors as desired.



Marsh Piston Type Boiler Feed Pump

Air Compressors

American Improved steam and power driven air compressors have capacities ranging from 3 to 850 cubic feet of air per minute. They are of the most approved and up-to-date design and highest efficiency is guaranteed.



American Outside Center Packed Plunger Pump.

Bulletins

We issue a series of 23 bulletins each covering a different type of pump. Write us for bulletins covering the types in which you are interested or we will be glad to furnish the complete set neatly bound upon request.

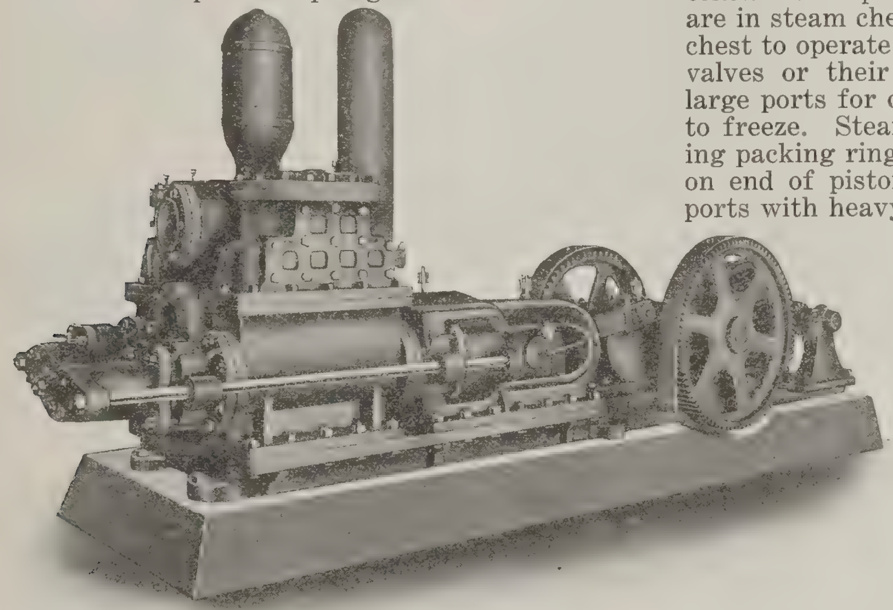
BOYTS, PORTER & CO.

CONNELLSVILLE, PA., U. S. A.

MANUFACTURERS OF

Yough Pumps

Yough Duplex, Double Acting, Double Plunger, Electric Driven Mine Pump



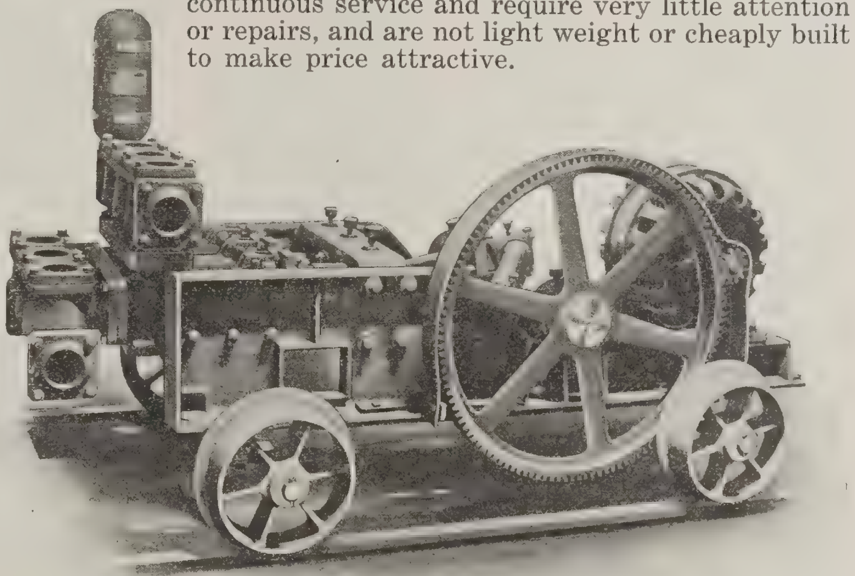
Cement lined and Bronze fitted throughout. Outside end packed plungers. Size: 9-inch Plungers, 10-inch Stroke, 10-inch Suction, 8-inch Discharge, Operated by 50 H. P. Motor.

The Plungers are bolted to Cross Heads and are outside end packed. No piston rod is used inside of Water End, the Plungers only working in the Water Cylinder. There are only two Stuffing Boxes used, and they are separate castings from Cylinder, one at each end of Water Cylinder. The Water Valve Chamber is a separate casting from Water Cylinder, and contains all the Water Valves and seats. These Pumps are well built and compact and have great strength and durability. Machine Cut Gears, covered with guards. Glands and Stuffing Boxes Bronze Lined. Bronze Inside Stuffing Box Rings. Bored out guides with Bronze Adjustable Wearing Shoes and Cast Steel Connecting Rods with Adjustable Wedge Brasses furnished in 6″ and larger size Water Ends, also Pillow Blocks with Adjustable Quarter Wedge Bearings, lined with Magnolia Metal. Plungers either Chilled, Bronze or Wood. All inside cast parts in Water End Cement Lined against action of sulphur water.

Yough Mine and Tank Pump

Size—10-inch Steam Cylinder, 6-inch Water Cylinder, 12-inch Stroke, 4-inch Suction, 3-inch Discharge, 1¼-inch Steam, 1½-inch Exhaust.

The Yough Mine Pumps are among the best constructed, simplest, have fewer parts than any other Pump on the market, and requires less attention or repairs to keep up. All steam valves are in steam chest, no bolts or nuts inside of steam chest to operate valve motion, no rocker arms, plug valves or their equivalents, and no lost motion, large ports for operation by air, making less liable to freeze. Steam piston head fitted with self-acting packing rings, no bolts or nuts used except nut on end of piston rod. Water cylinder lined over ports with heavy cast Bronze liner, not Brass pipe, as commonly used. Piston Rods in two pieces in larger sizes permit either head to be taken out without disturbing other end of Pump. Water Valve chamber contains all the water valves and is a separate casting from cylinder. All inside cast iron parts in water end where not Bronze fitted are cement lined, which protects Pump against action of sulphur water. Bronze Valve Chamber can be furnished when desired at an additional cost. These Pumps are built heavy and strong to stand long, continuous service and require very little attention or repairs, and are not light weight or cheaply built to make price attractive.

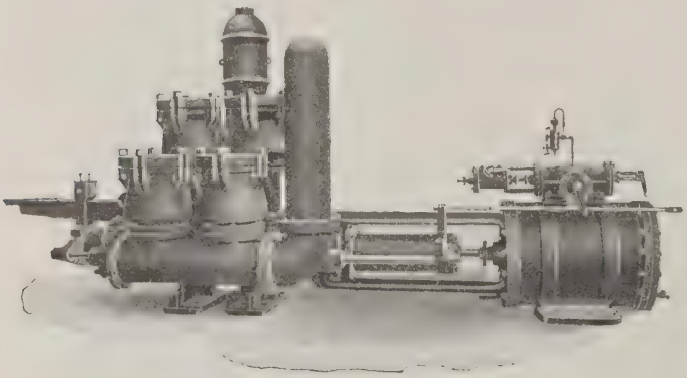


Yough Triplex, Single Acting, Portable Electric Driven Mine Pump

Cement Lined and Bronze Ftted. Size: 4-inch Plungers, 6-inch Stroke, 2½-inch Suction, 2-inch Discharge, Operated by 3.5 H. P. This Pump is built especially for dip heading and sump work, taking up little head room; made strong and compact. The Water Valve Chambers are separate from Water Cylinder. In case of repairs not necessary to throw Pump away; as in one piece Water End. Plungers are bolted to separate Cross heads fitted with heavy Bronze adjustable wearing Shoes. Cast Steel Connecting Rods and Crank Shaft. Machine cut Gears covered with guards. All parts made easy accessible. Suction and Discharge right and left hand, or Vice Versa. Built from experience of over thirty-five years in mine pumping.

Yough Double Plunger Mine Pump—Wood Lined

Size: 24-inch Steam Cylinder, 12-inch Plunger, 36-inch Stroke, 12-inch Suction, 10-inch Discharge, 3-inch Steam, 4-inch Exhaust.

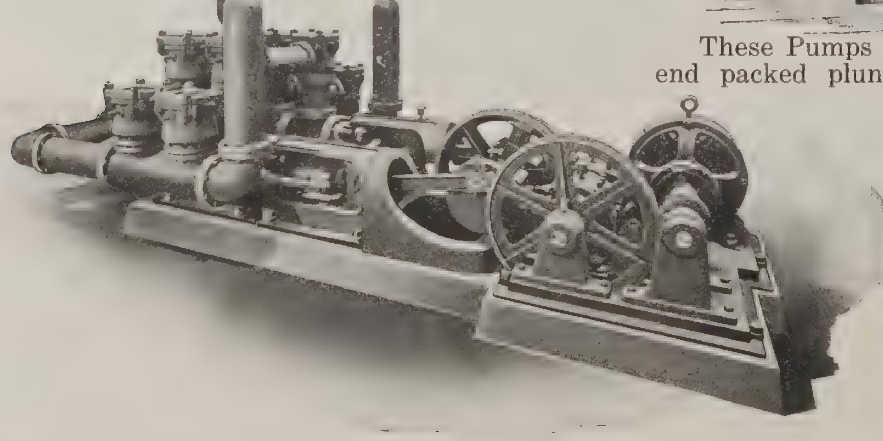


Outside end packed Plungers, bolted to Cross Heads. Stuffing Boxes of generous depth with heavy Bronze Bushing and Bronze Inside Stuffing Box Rings, Glands Bronze Bushed. Separate and accessible Pot Valve type Water Chambers, lead and wood lined, with top lids (lead lined) fitted with loose hinged bolts and pins for quick, easy access to the valves (plan of lead lining patented).

Entire inside of Water End Wood Lined, that no cast iron parts are exposed to action of sulphur water, with Air and Vacuum Chambers, Cataract Valve on Steam Chest to regulate valve motion. Simplicity in construction, having few parts, made strong and heavy and of best grade material, requiring very little attention or repairs, and is the most durable, economical and best protected mine pump built, and specially adapted for worst conditions of mine service. For Operation by either Compressed Air or Steam.

Yough Duplex, Double Acting, Double Plunger, Electric Driven Mine Station Pump—Wood and Lead Lined

Size: 10-inch Plungers, 12-inch Stroke, 12-inch Suction, 10-inch Discharge, operated by 75 H. P. Westinghouse Motor, Falk Herring Bone Gears, Box Girder Type Guides and Pillow Blocks with adjustable quarter wedge bearings. Cast Steel Connecting Rods.

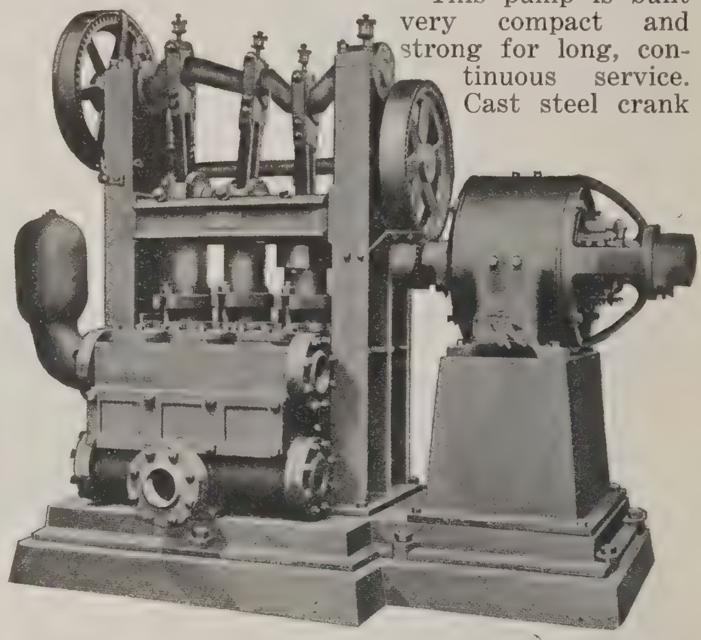


Arranged for Any Size Motor. Other Sizes Built to Order.

The best and most thoroughly protected pump built, especially designed and adapted for hard service and strong sulphur water.

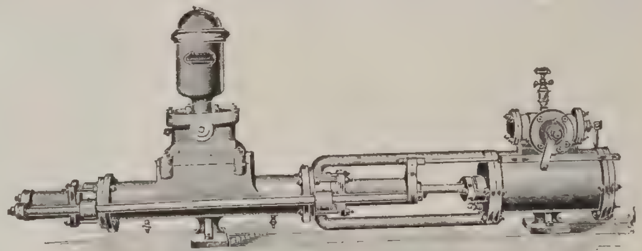
Yough Vertical Single Acting Triplex Pump, Plunger Pattern, For Fresh Water or Mine Service

Size: 6-inch Plungers, 6-inch Stroke, operated by 15 H. P. Motor.



This pump is built very compact and strong for long, continuous service. Cast steel crank Shaft and Connecting Rods fitted with adjustable brasses. Water Valve Chamber in one casting arranged for quick and easy access to Valves. 3 Suction and 2½ Discharge openings. Double Reduction Gearing Machine cut and covered with guards. Pump and Motor mounted on heavy Bed Plate with planed face.

Yough Special Boiler Feed Pump. Double Plunger Pattern. Standard Sizes—For Hot or Cold Water



These Pumps are direct, double acting, outside end packed plungers, and are constructed that plungers work close in the water cylinder, with but little clearance at end of plunger, thus allowing no surplus hot water to remain in cylinder at end of stroke, which prevents expansion of steam.

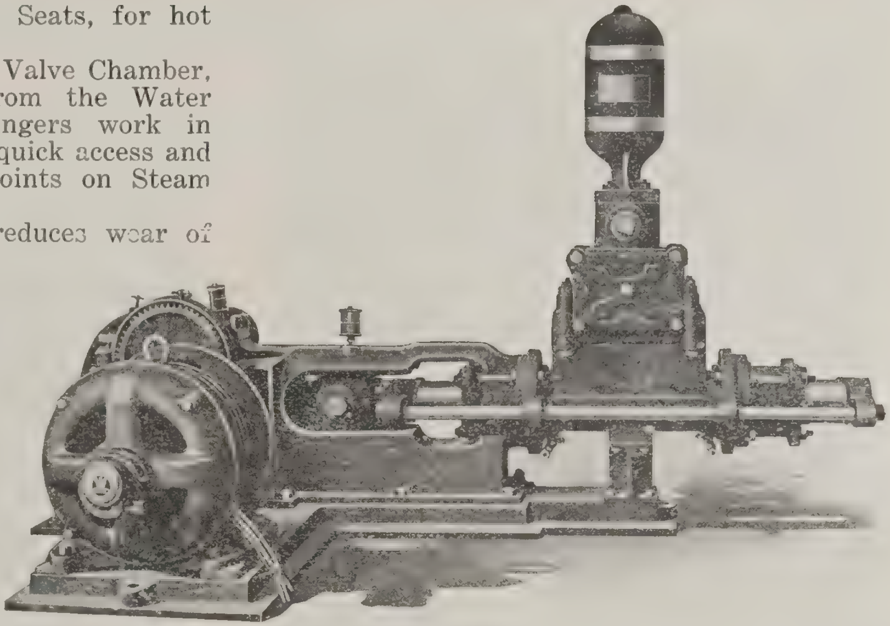
Will run very slow and continuous when feeding boilers, and are very economical in steam.

Specially designed and built for Boiler Feed Service, with

Bronze Self-Grinding Valves and Seats, for hot or cold water.

All water valves are in Water Valve Chamber, which is a separate casting from the Water Cylinder. Nothing but the plungers work in Cylinder. All parts arranged for quick access and easy handling. Ground steam joints on Steam End.

Built in long stroke, which reduces wear of Pump, have great strength and durability for long, continuous service. A Boiler Feed Pump should run slow. In pumping hot water the pump should be set that the water flows into Pump. Always give horse-power boilers to be supplied when ordering and to designate size of Pump give diameter of Steam Cylinder and Water Plungers and length of stroke. In referring to one already in use give shop number of Pump.



The Yough Electric Power Head With Differential Plunger

Size: 24-inch Stroke. Operated by 5 H. P. Self-Starting Motor. Single, Vertical Electric Driven Deep Well Head with Direct Connected Motor.

The Pump illustrated in Fig. 1388 is our improved type, built very compact and strong, close to base for rigidity, and designed that the power head need not be removed from foundation to remove casing and working barrel from the well.

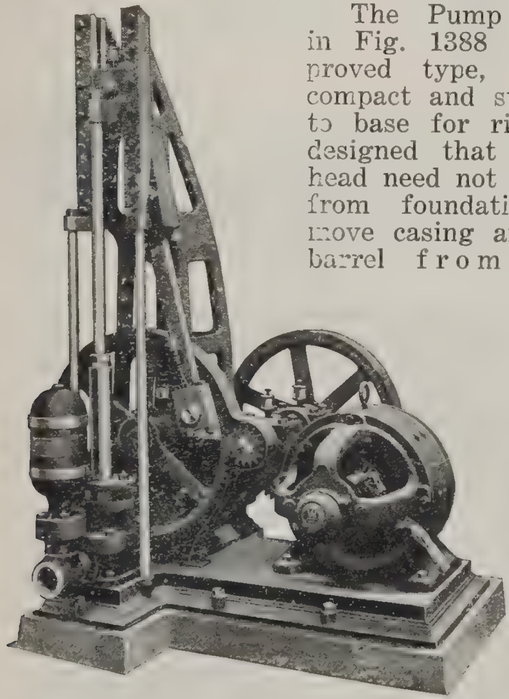


Fig. 1388

Crank Shaft is of forged steel with adjustable brasses, double reduction gearing, machine cut and covered with guards. All bearings and caps lined with Magnolia Babbitt Metal. Air Chamber on Discharge. Entire Pump mounted on heavy cast iron bed plate with planed face. Differential Plunger maintains steady flow of water. Can be used with either single or double acting working barrel. Can be arranged for belt driven if desired.

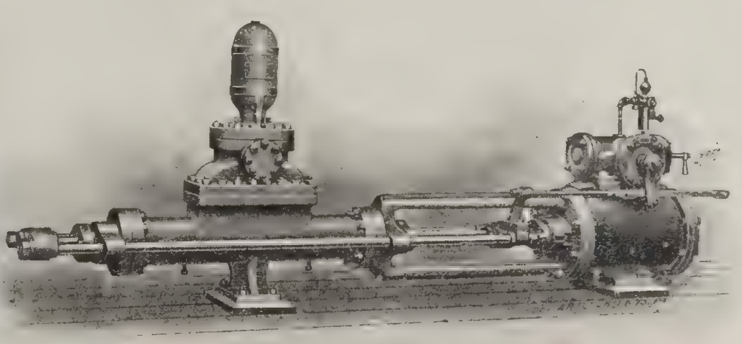
Yough Double Acting Plunger Pump

Single Water End, Outside End Packed Plungers. Size: 3½ inch x 8 inch, operated by 5 H. P. Motor. Other sizes built to order.

Built compact and strong and adapted for general pumping or mine service. Pump mounted on Bed Plate, insuring rigid support and alignment. Double reduction gears, machine cut and covered with guards. Cross heads fitted with Adjustable Bronze Wearing Shoes. Cast Steel connecting Rods and Shaft. Sq. Valve Water Valve Chamber specially adapted for handling small particles of coal or other foreign matter in mine pumping without clogging the valves. Can furnish with rod. Valve Chamber with Bronze Seats, Rubber Valves, etc. Send for complete catalog.

Yough Mine Pump, Plunger Pattern—Cement Lined and Bronze Fitted.

Size: 16-inch Steam Cylinder, 8-inch Plungers, 18-inch Stroke, 6-inch Suction, 5-inch Discharge, 2-inch Steam, 2½-inch Exhaust. Built for Operation with Steam or Compressed Air. Standard Strokes.



This type of Pump is specially adapted for mine service, deep stuffing boxes, plungers outside end packed and guided, stuffing boxes and glands lined with heavy Bronze liner and Bronze inside stuffing box ring which takes the wear off the stuffing box and can be easily and quickly removed and replaced. No wearing parts in Water Cylinder, except inside ring. Separate Water Valve Chamber contains all the Water Valves, and have large areas and free passages. Nothing but the plungers work in Cylinder and have no long piston rod extending into Cylinder to come in contact with sulphur water, or no extra stuffing box as used in a center packed Pump of other makes. All ground steam joints on steam end.

A. S. CAMERON STEAM PUMP WORKS

Manufacturers of

Steam, Centrifugal and Triplex Pumps

Main Office, 11 Broadway, N. Y. Branch Offices in All Large Cities

Cameron Steam Pumps
have been widely used in coal mines for over half a century, because they are unusually simple, compact, strong, durable and economical. Fewer working parts than any other steam pump. Only four pieces in the steam mechanism. By simply removing the valve chest cover the whole interior of the water cylinder is in full view. The suction and discharge valves are held in place by one stem, which can be removed by unscrewing one plug. Combined with these advantages is the Cameron high grade of material and workmanship.

The Cameron Piston Pump
(Shown in the upper illustration)
is built for all classes of service, in capacities from 10 G. P. M. to 1000 G. P. M. against 400 feet head at ordinary speed. The water cylinders are made with or without fixed or loose linings, or entirely of our special acid resisting metal.

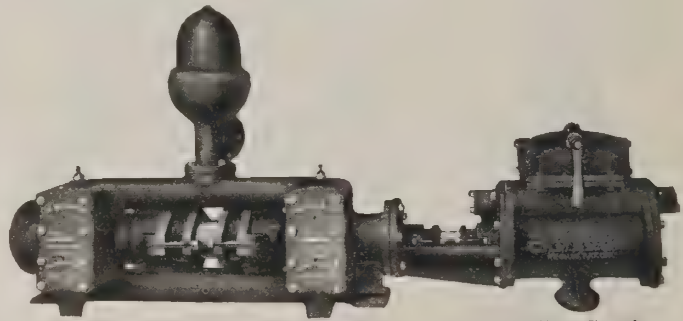
Cameron Horizontal Plunger Pumps
(Shown in the second illustration)
have all the economical operating features of the piston type described above. They are especially built to handle gritty water. In the water end there are no wearing parts, except the packing in the stuffing boxes, which can be instantly adjusted from the outside. The pump barrel cannot get worn by grit or sand, as the plunger works in loose sleeves. Built in capacities from 10 G. P. M. to 1200 G. P. M. to work against 400 feet head at ordinary speed.

Cameron Vertical Plunger Pumps
(Shown in the lower illustration)
have gained a world wide reputation as the most successful shaft sinking pumps. They are exceptionally simple and strong. They take up less room in the shaft than any other pump, and have no outside parts to get damaged by collision with the side walls. They are certain in operation, can handle gritty water and require little attention. Built in capacities from 25 G. P. M. to 1600 G. P. M. to work against heads of 400 feet at ordinary speed.

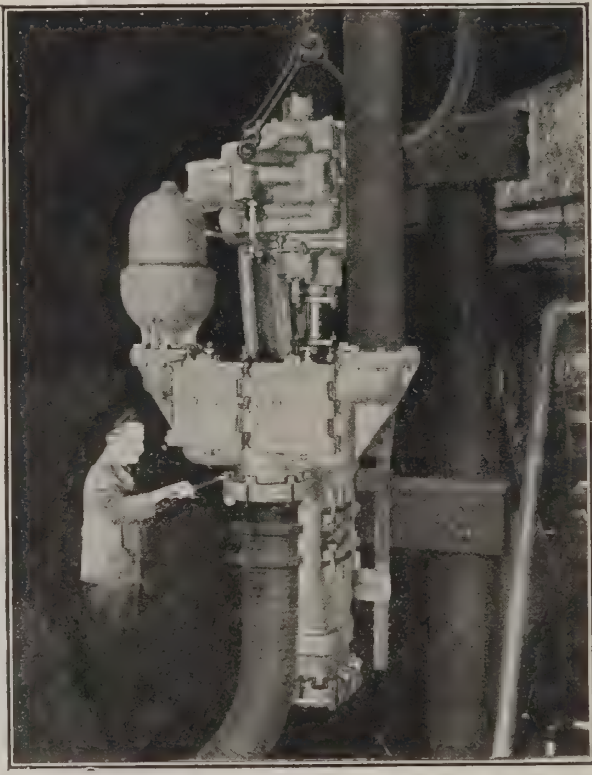
The reliability and efficiency of CAMERON PUMPS has been tested in thousands of coal mine installations.

Full information in Bulletin No. 104—It's free.

Cameron 14 x 9 x 18 Steam Piston Pump, 350 G. P. M. Working Against 300 ft. Head, in Ill. Coal Mine.



Cameron Horizontal Plunger Pump for Coal Mine Service.



Cameron 20 x 12 x 16 Vertical Plunger Pump, 600 G. P. M., Working Against 300 Feet Head, in a Penn'a. Coal Mine.

Cameron Centrifugals are most modern in design and built with the special aim to produce a combination of high working value and low operating cost. Actual tests have proved that they are highly efficient and economical.

The superintendent of a Pennsylvania Coal Mine writes: "The Cameron Centrifugal, which took the place of another make, delivers 20% more water than the other pump did when new."

The Cameron Double Suction Volute Pump

(Shown in the upper illustration)

is built for moderate heads. It has an enclosed impeller and the casing is horizontally split. By removing the upper casing the working parts are easily reached without disturbing pipe connections or pump alignment.

Built in capacities from 50 G. P. M. to 15000 G. P. M., in a variety of speeds, and for heads from 10 to 200 feet. Described in Bulletin No. 150.

The Cameron Multi-Stage Pump

(Shown in the second illustration)

is built for high heads. It is very simple, strong and dependable. Its efficiencies are high and continue over a long period of service. The impellers are enclosed, and the horizontally split casing gives quick access to the working parts.

Built in two, three and four stages, for capacities from 75 G. P. M. to 25,000 G. P. M. and heads from 120 to 800 feet. Described in Bulletin No. 151.

The Cameron Single Suction Pump

(Shown in the lower illustration)

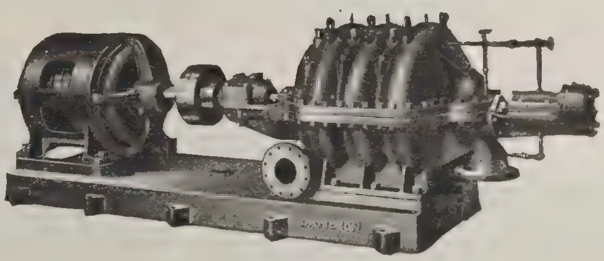
is strong and rugged all through. The impeller is of the open type. This pump is very efficient in handling mine water, which contains grit and small solids.

Built in capacities from 200 G. P. M. to 8,000 G. P. M. for heads up to 70 feet. Described in Bulletin No. 152.

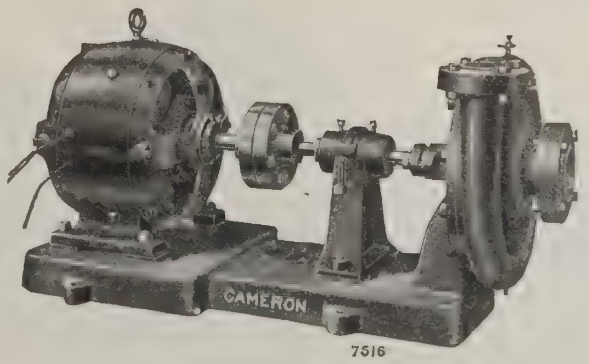
All these CAMERON CENTRIFUGALS can be direct connected to electric motor or steam turbine, or can be arranged to suit any motive power.

Write for Bulletins.

Cameron 11" Double Suction Volute Centrifugal Pump, Installed in a Penn'a. Coal Mine.



Cameron 6" Four-Stage Centrifugal, Delivering 1000 G. P. M., Against 500 Feet Head, in a Tenn. Mine.



Cameron Open Impeller Motor Driven Pump for Heads Up to 70 Feet.

Connellsville Mfg. & Mine Supply Co.

Main Office and Works
CONELLSVILLE, PA.

Brown-Marx Building,
Birmingham, Ala.

918 Webster Building,
Chicago, Ill.

Manufacturers of

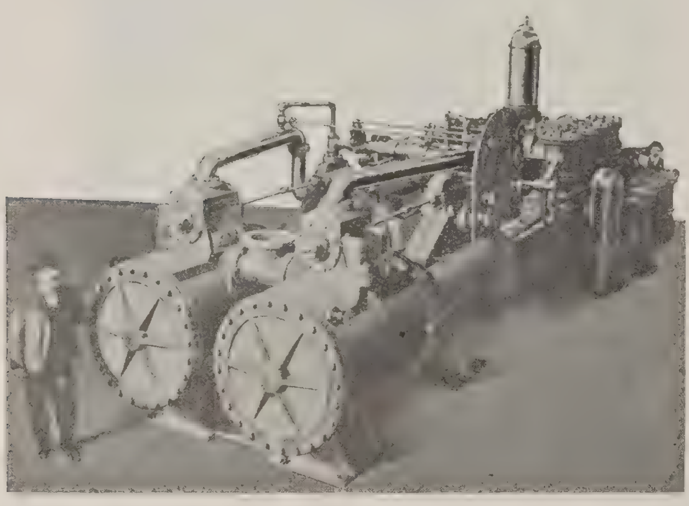
Steam, Electric and Compressed Air Pumps

We design and build practically every variety of Steam, Electric and Compressed Air Pumps, covered by the Lepley patents.

Our specialty is wood, lead and bronze protected Mine Pumping Units of large capacities.

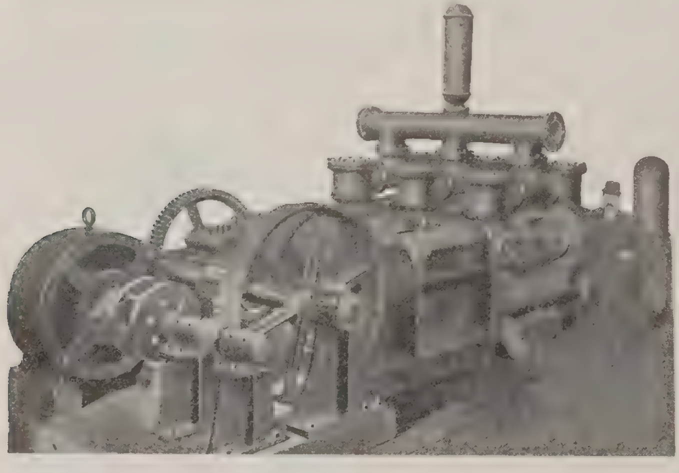
We have had over thirty years of experience in designing and building Mine Pumping Units for the very worst conditions. Our experience and advice are yours for the asking.

Our records: Efficiency—Satisfaction.

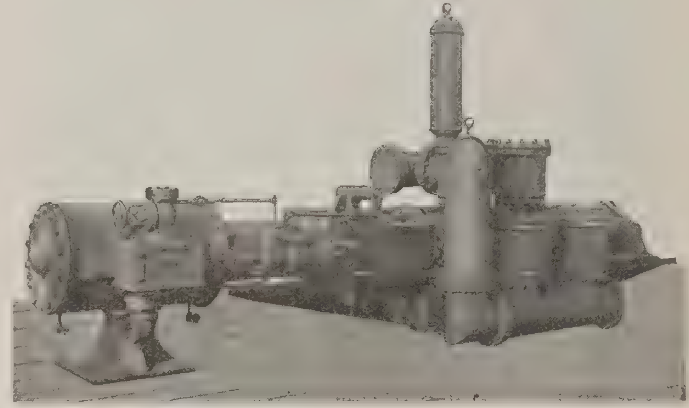


20 x 40 x 16 x 48″ Duplex, Tandem, Compound, wood lined Mine Pump. Maximum capacity 4000 gallons against 500 ft. head. Weight 150,000 lbs.

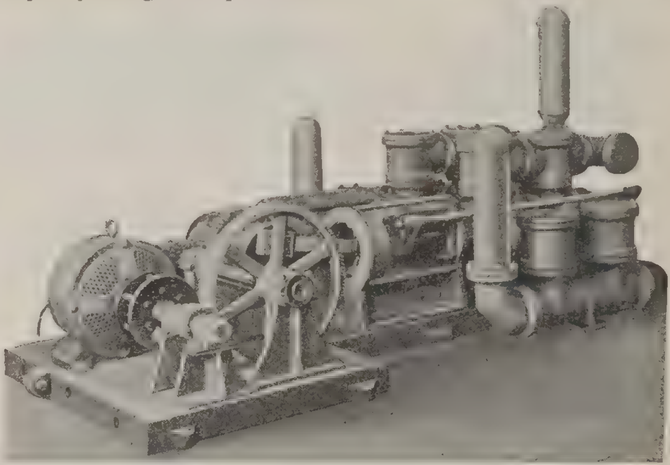
24 x 10 x 36″ Duplex, Compressed Air Mine Pump, wood, lead and bronze fiitted. Normal capacity 1000 gallons per minute. Weight 55,000 lbs. Guaranteed to run 100 ft. piston travel per minute without freezing.



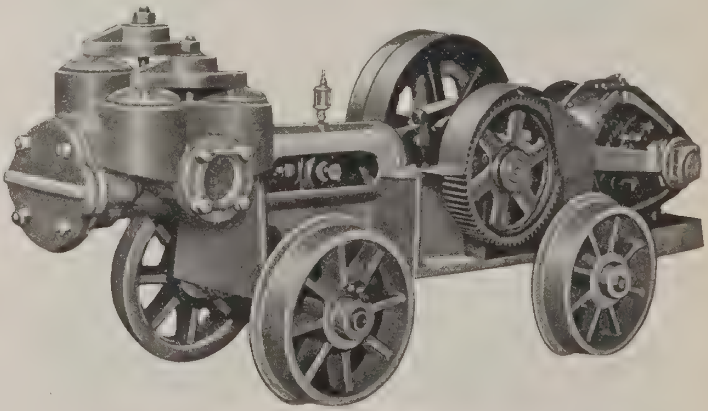
10 x 18″ Triplex, horizontal, double acting, electrically driven Mine Pump, wood lead and bronze fitted. Normal capacity 1200 gallons per minute against 500 ft. head. Weight 85,000 lbs. Most accessible throughout and carries highest efficiency records.



24 x 12 x 36″ Single, wood lined Mine Pump. Normal capacity 550 gallons per minute.



10 x 12″ Duplex, outside end packed plunger, heavy duty, Electric Mine Pump. Normal capacity 1000 gallons per minute against 400 ft. head. Weight 48,000 lbs. Water End wood, lead and bronze protected.



6 x 8″ Single, Electrically driven, Dip Pump, self-contained, mounted on ordinary pit car truck. Solid bronze water end. Most substantially bulit for hard service.

THE DAYTON TURBINE PUMP CO.

Cleveland. Ohio

Builders of the

"Dayton" Turbine and Volute Pumps

THE MARK DAYTON OF QUALITY

Multi-Stage and Single-Stage Pumps are of the Double Suction type.

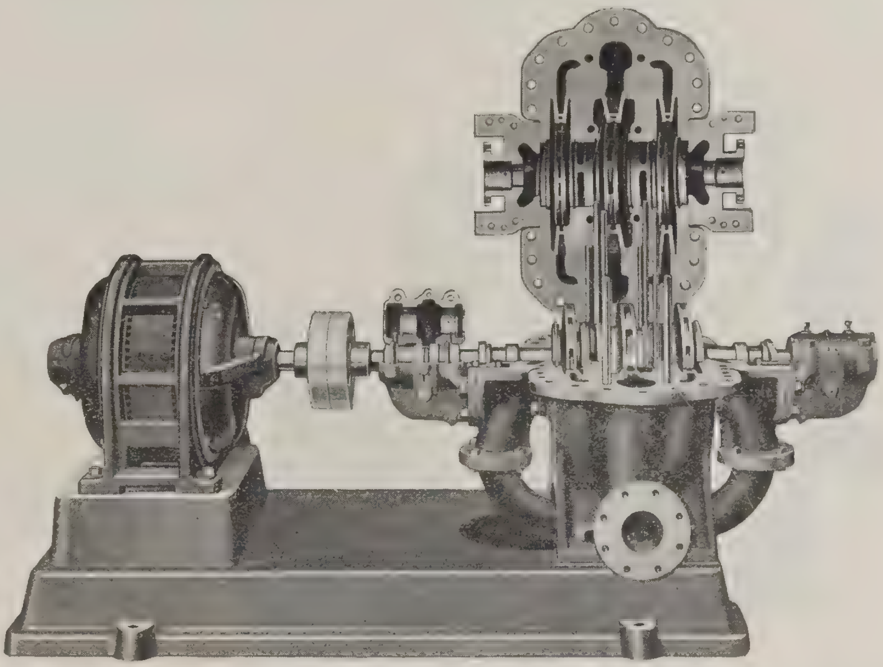
Capacities range from 20 gallons per minute to 30,000 gallons per minute.

Designed for any pressure within practical limits.

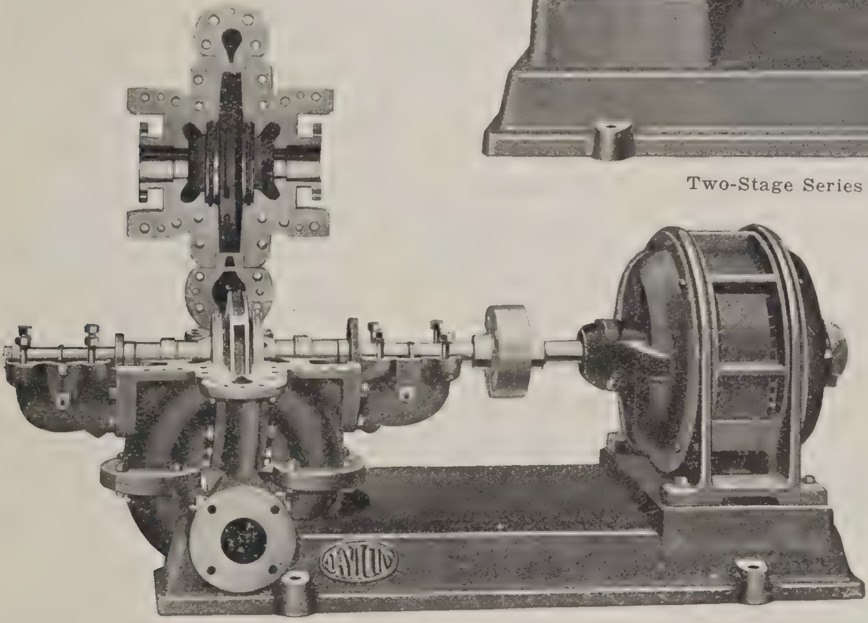
These pumps can be driven by electric motors, steam turbines or other motive power or belt drive.

They can be furnished in either the horizontal or vertical types.

Built of suitable metal to meet conditions.



Two-Stage Series Pump, opened for inspection.



Single-Stage Pump, opened for inspection.

Highest grade of material and workmanship.

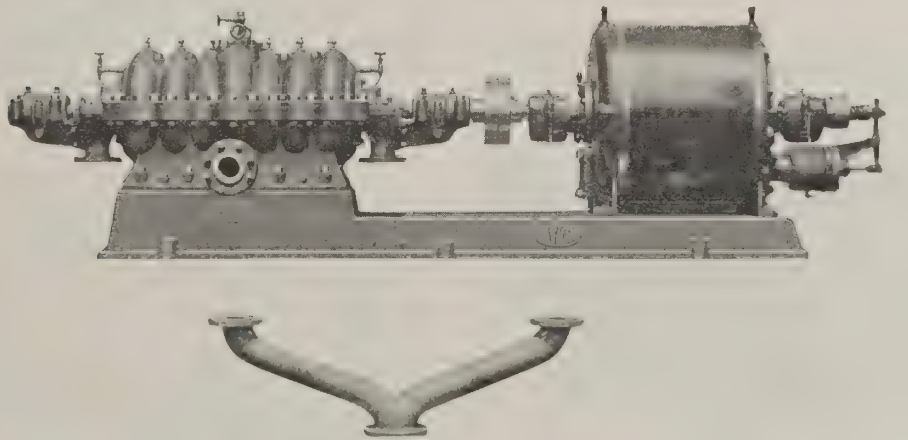
High efficiency.

Durability.

Renewable wearing rings on impellers and casings.

Renewable shaft covers.

Ring oiling bearings.



Four-Stage Pump, driven by steam turbine.

CATALOGS AND PRICES FOR ALL SERVICES CHEERFULLY FURNISHED ON APPLICATION.

THE DEMING COMPANY

SALEM, OHIO

HAND AND POWER PUMPS FOR ALL REQUIREMENTS

GENERAL AGENCIES

PITTSBURGH, Harris Pump & Supply Co.
NEW YORK, Ralph B. Carter Co.
CHICAGO, Henion & Hubbell
DENVER, Hendrie & Bolthoff Mfg. & Supply Co.

Agencies in All Principal Cities.

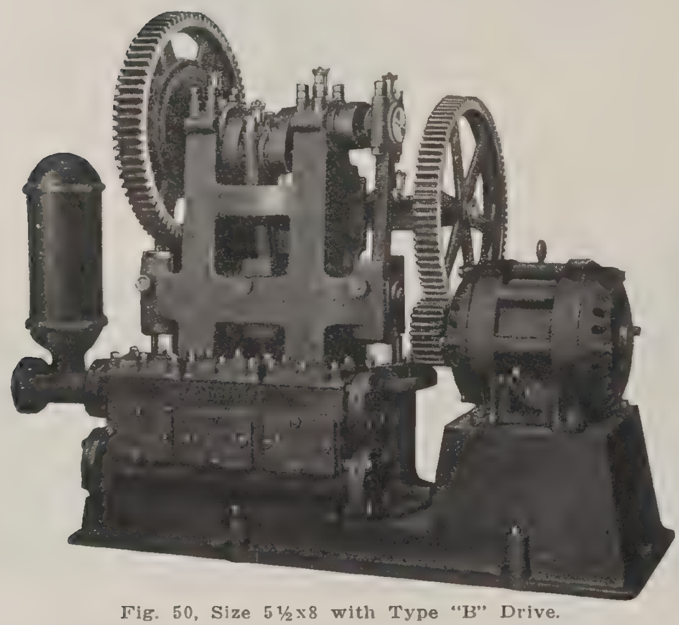


Fig. 50, Size 5½x8 with Type "B" Drive.

Products

Hand and Power Pumps for mine service and for general water supply, including:

Triplex Power Pumps

which are made in vertical or horizontal types; portable or stationary; single or double acting; electric or belt driven; many different styles and sizes; standard or special construction as conditions may necessitate; capacities from 5 gallons per minute to 2,000 gallons per minute.

Power Piston Pumps

Electric or belt drive; stationary or portable; standard or special construction, to suit conditions; capacities from 20 to 200 gallons per minute. Trade names "Neptune," "Triumph," "Trojan," "Vulcan," and "Ajax."

Deep Well Working Heads and Cylinders

Electric or belt driven; standard or special construction to suit conditions; for pumping water from deep wells for general water supply.

Economy

Deming Power Pumps cost much less to operate than steam pumps. Carefully conducted tests have proven that when a steam pump is used as a boiler feeder, very often much more steam is required to operate the steam pump than is consumed by the engine which runs the entire plant. This is more plainly demonstrated when it is understood that the average direct acting steam pump consumes not less than 150 pounds of steam per H. P. per hour, while a fairly efficient steam engine will require not more than 30 to 40 pounds per H. P. per hour. To this direct saving in steam consumption should also be added the loss by condensation incidental to long steam pipe lines, and also the additional cost and inconvenience of the pipe as compared with electric wiring. When used as sump pumps, gathering pumps, "station" pumps, boiler feeders, etc., Deming power pumps give the greatest possible returns on the investment because of their low operation and maintenance expense.

Service

Large stocks of standard mine pumps and motors are carried at Salem, Pittsburgh, Chicago, and Denver for prompt shipment. Wire orders are given especial attention.

Experienced engineers at the factory and branch agencies are prepared to furnish expert advice concerning outfits which will best suit existing conditions. When corresponding, it will facilitate matters if we are supplied with the information requested under the heading "When Ordering Pumps," on page 402.

Evidence

The letters below are typical of hundreds which we have on file, testifying to the merits of Deming Pumps. We will gladly supply the names of users of Deming Pumps in your vicinity if desired.

From West Kentucky Coal Company.

Sturgis, Kentucky.

I take pleasure in advising that the thirteen Power Pumps purchased from you within the last few years have given excellent satisfaction.

We have had experience with a large number of various makes of pumps, and have after careful investigation, adopted your Pumps as our standard, for all inside and outside work requiring Power Pumps.

We cheerfully recommend your equipment for all mining purposes.

Yours very truly,
(Signed) R. J. FOLEY, JR.
Pur. Agent.

From the Northern Coal & Coke Company.

512 Boston Bldg., Denver, Colo.

We are using two of your small mine pumps, one of them having been in use continuously, **for over ten years** at our Industrial mine, at Superior, Colo. These pumps have both given splendid service and it gives me pleasure to say a good word for them.

(Signed) CHAS. M. KIRK,
Pur. Agent.

From the Mosgrove Coal Works.

Mosgrove, Pa.

Answering your inquiry of the 14th inst., relative to the Deming electric mine pumps furnished to this Company, would say that the Fig. 70, 4x6, 2½ H. P. pump shipped to us on November 28th, 1903, was put into use as soon as received, and has been giving very satisfactory service ever since; the same is true of the Fig. 70—4x6, 3 H. P. pump shipped us on April 18th, 1906.

The service on both of these pumps has been practically continuous; cost of repairs to wearing parts relatively small, and both are in good shape at the present time.

Yours very truly,
GEO. H. DEIKE,
Supt.

Guarantee

Our pumps are fully guaranteed to perform the duty for which they are rated or recommended, and we shall hold ourselves under obligation to supply, without charge, any part breaking within one year of date of shipment, where such breakage bears unmistakable evidence of faulty material or workmanship.

Catalogues

In addition to our many different pumps for mine service, we also make hundreds of styles and sizes of hand, and power pumps for all uses, which are described in the following departmental catalogues:—

Power Pump Catalogue "J"—192 pages devoted to triplex and other power pumps; deep well working heads and cylinders, etc.

General Catalogue No. 25—360 pages; covering our pitcher spout pumps; well pump standards; set length lift and force pumps; pumps for miscellaneous uses, cylinders, well supplies, etc.

Spray Pump Catalogue—40 pages, describing our bucket, knapsack, cart, barrel, tank, field and power sprayers, also nozzles and accessories for all spraying conditions.

DEMING TRIPLEX MINE PUMPS

SPECIFICATIONS OF STANDARD VERTICAL AND HORIZONTAL TYPES

Fig. 50, For General Service

(Illustrated on opposite page.)

These specications give a good idea of the rugged construction of Deming Pumps in general. We give the specifications of Fig. 50, because it is a typical triplex power pump, and is one of our popular pumping units.

Frame consists of two standards, and includes crosshead guides and main crank shaft bearings, the latter being lined with best anti-friction metal. In sizes 4x4 and smaller the frame is cast in one piece with the cylinders.

Crank Shaft is of best open hearth steel casting in one piece.

Gearing is machine cut, and is double in 10-inch stroke sizes, and in sizes 11x12 and larger. Other sizes made with double gearing at extra price.

Pinion Shaft is of steel, running in boxes lined with best anti-friction metal, and bolted to the main housings.

Connecting Rods, in sizes 4x6 and larger, have bronze boxes with wedge and screw adjustment at crosshead end, and marine type babbitted boxes at crank end. Smaller sizes have bronze bushings at crosshead ends.

Crossheads run in bored guides, sizes 4x6 and larger having adjustable bronze shoes.

Plungers are of hard, close-grained cast iron, finished true and smooth, and reciprocate through packing of ample depth.

Cylinders and Base are in one casting in sizes 10x10 and smaller, and in larger sizes the cylinders are in three separate castings bolted to the base.

Valve Chambers, in sizes 3½x4 and larger, are separate castings bolted to the cylinders. They are of liberal proportions, affording large valve area, and all valves are readily accessible.

Valves for cold water are rubber discs, protected on top from cylindrically wound springs by brass plates. For hot water either special hard composition valves or bronze valves are furnished as ordered.

Valve Seats are of bronze, screwed into decks, and are of the grid type. Iron seats and valves furnished when conditions require.

Air Chamber furnished when specified. Vacuum Chamber to order.

Grease Cups, or Oil Cups if specified, and wrenches furnished with all pumps.

Type "B" Drive (Cipher, "TYPEB") includes sub-base on which both pump and motor are mounted, and with gearing connection between pump and motor.

Fig. 50, Standard Sizes, Capacities, Etc.

Plungers		Capacity		Max. Working Pressure, Lbs.	Diam. of Pipes		*Tight and Loose Pulleys	Cipher
Diam. Inches	Stroke Inches	Usual Rev. per Min.	Gals. per Min.		Suction Inches	Dischg. Inches		
2	2	70	5.67	150	1½	1	8x 2	Obese
2½	2	70	8.89	150	1½	1	10x 2	Oberlize
2½	3	60	11.4	150	2	1½	12x 3	Oaken
3	3	60	16.2	150	2	1½	14x 3	Oath
3½	3	60	22.	150	2	1½	16x 3	Oakling
3½	4	60	30.	150	2½	2	16x 4	Obelus
4	4	60	39.	150	2½	2	18x 4	Oakum
4	6	60	59.	160	2½	2	20x 5	Oarsman
4½	6	60	74.	150	3	2½	20x 5	Oaky
5	6	60	91.	150	3	2½	24x 5	Oasis
5½	8	60	147.	150	4	3	28x 6	Oatmeal
6	8	55	161.	140	4	3	30x 6	Obduration
7	8	55	220.	150	5	4	30x 8	Obdurate
8	8	55	287.	150	5	4	36x 8	Obiter
8½	8	55	324.	140	6	5	36x 8	Obdure
8	10	50	326.	140	6	5	36x 8	Overcoat
9	10	50	413.	160	8	6	42x10	Obloquy
10	10	45	459.	150	8	6	42x12	Obsignate
10	12	42	514.	140	8	8	42x14	Objuration
11	12	42	622.	160	10	8	48x14	Obduct
12	12	42	740.	150	10	8	48x16	Obduction
12	14	40	822.	150	12	10	48x18	Observance
13	14	40	965.	140	12	10	48x20	Observant

*Sizes 9x10 and larger regularly furnished with tight pulley only. Gear ratio is 5 to 1.

Fig. 70, For General Service

(Illustrated below.)

Fig. 70 Portable Electric Driven Triplex Mine Pump is of the horizontal, single-acting, outside packed and outside guided plunger type, and is especially designed for pumping out mine sumps. It is very compact, requiring a minimum amount of head room, and being mounted on a portable truck, is easily moved from place to place as required. The truck is wholly of iron, and not affected by moisture, thereby insuring permanency of alignment of pump and motor.

The standard construction of the working parts of the pump, including guide columns, crank shaft, gearing, connecting rods, plungers, valve chambers, etc., is the same as for corresponding sizes of our Fig. 50 vertical pump, and insures the promptness in furnishing repair parts, which is so essential in mining operations.

The cylinders are of special design to meet the conditions imposed by the horizontal type.

Standard construction includes iron plungers, glands, cylinders and valve chambers, and iron truck complete with wheels having a 9-inch diameter tread; intermediate gear and rawhide motor pinion for connecting motor, but **motor is not included unless so specified.**

All gearing is carefully protected by steel guards. Truck wheels of other diameter than 9-inch furnished, when specified. Grease cups, or oil cups if specified, and wrenches furnished with all pumps.

Special Construction: Brass cased plungers, or solid bronze plungers, and bronze lined stuffing boxes and glands, or entire water end made of bronze, at extra price.

Correspondents should state gauge of track, height of roof, suction lift, discharge elevation and approximate lengths and diameters of pipes, and should also furnish dimensions of motor, if ordering.

We can furnish Fig. 70 with a base for stationary service, if desired. Pump is then designated as Fig. 71.

Fig. 70, Standard Sizes, Capacities, Etc.

Plungers		Capacity			Max. Head Feet.	Diam. of Pipes.		Intermed. Gears	*Cipher
Diam. Inches	Stroke Inches	Gals. per Rev.	Usual Rev. per Min.	Gals. per Min.		Suction Inches	Dischg. Inches		Standard Fitted
3½	4	.50	60	30	300	2½	2	Special	Organism
4	4	.65	60	39	300	2½	2	Special	Organist
4	6	.98	60	59	320	2½	2	Special	Ordinal
4½	6	1.24	60	74	300	3	2½	Special	Orbate
5	6	1.53	60	91	300	3	2½	Special	Ordinance
5½	8	2.46	60	147	300	4	3	Special	Ordinate
6	8	2.94	55	161	280	4	3	Special	Orgasm
7	8	4.00	55	220	300	5	4	Special	Ordination
8	8	5.22	55	287	300	5	4	Special	Orgy
8½	8	5.90	55	324	280	6	5	Special	Ordnator

Gear ratio 5 to 1.

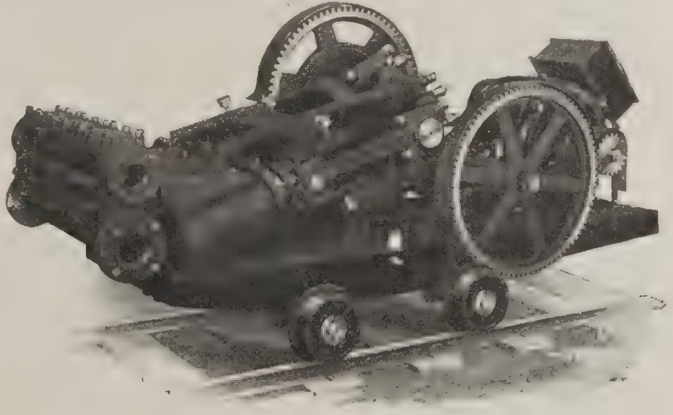


Fig. 70, Portable Mine Pump.

See Next Page.

DEMING HORIZONTAL TRIPLEX PLUNGER PUMPS FOR MINES

WITH GUARDED GEARS AND ACCESSIBLE VALVES

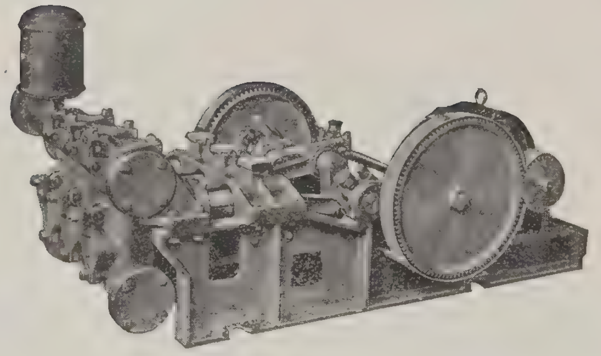


Fig. 73.

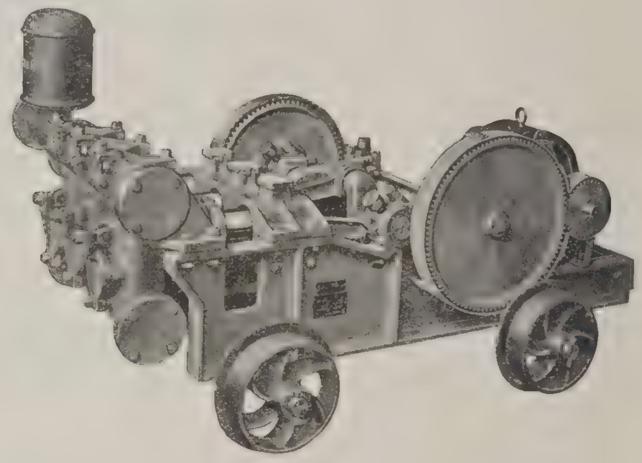


Fig. 72.

Figs. 72 and 73 Horizontal Single-Acting Triplex Plunger Pumps are the result of twenty years of experience in designing and manufacturing electric pumps for mine service and are recommended for use where conditions are such that the pressure at the pump does not exceed 100 pounds. The design has been made as simple as possible throughout, especial attention being given to accessibility and to the protection of the operator from injury.

Figs. 72 and 73 are the same in construction throughout, except that Fig. 72 is furnished with axles and wheels for tracks, the gauge of which is not less than 32-inches for the 4 x 5 size, 39-inches for the 5 x 6 size and 42-inches for the 5½ x 8 size. The side frames of Fig. 73 are also provided with slots to permit mounting on mine car axles when desired to be used as a portable outfit. These pumps are also furnished, when preferred, with a single reduction of gearing for connecting a **Slow Speed** motor instead of with double reduction of gearing as illustrated. The valve area is large, and yet the design is such that the clearance is reduced to a minimum, making the pump especially desirable for a gathering pump, as it readily frees itself of air.

Specifications:—

Crank Shaft is of best open hearth steel in one piece with flange for gear.

Gearing is machine cut, the motor pinion being of rawhide unless otherwise specified. **Gears Are Carefully Guarded.** The Crank Gear is bolted to the crank shaft and can be taken off without removing the shaft from its bearings.

Connecting Rods have babbitt lined adjustable boxes at the crank end and bronze bushings at the plunger end.

Plungers are of close grained iron unless otherwise specified, and the cross-heads reciprocate through bored guides.

Cylinders and Valve Chambers are unusually heavy for mine service and are provided with hand hole covers which give very quick access to valves.

Valves are of rubber on bronze grid seats which are screwed into decks.

Air Chamber, Grease Cups and Wrenches are furnished.

Special Construction: Pumps furnished with bronze, or brass-cased plungers, and bronze-lined stuffing boxes and glands when required.

Figs. 72 and 73, Standard Sizes, Capacities, Etc.

Plungers		Capacities			Maximum Discharge Pressure Pounds	Diameter of Pipes		Cipher	
Diameter Inches	Inches Stroke	Gallons per Revolution	Usual per Revolutions Minute	Gallons per Minute		Suction Inches	Discharge Inches	Fig. 72	Fig. 73
4	5	.81	62	50	100	3	3	Ovate	Obole
5	6	1.53	66	100	100	4	3	Ouzel	Oby
5½	8	2.46	61	150	100	5	4	Otary	Ochry

DEMING DEEP WELL WORKING HEADS

FOR GENERAL WATER SUPPLY

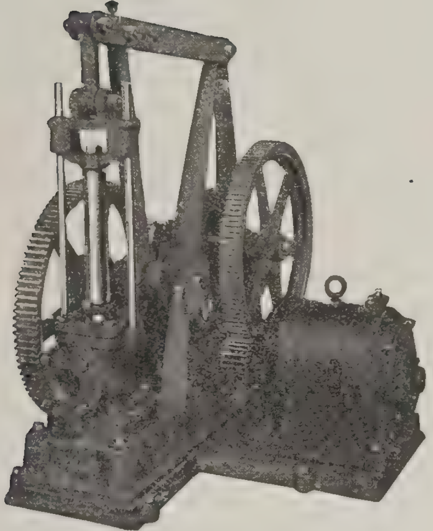


Fig. 62, 16-inch Stroke with Type "B" Drive.

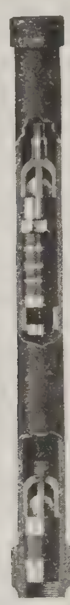


Fig. 324 Single Acting Brass Deep Well Cylinder.

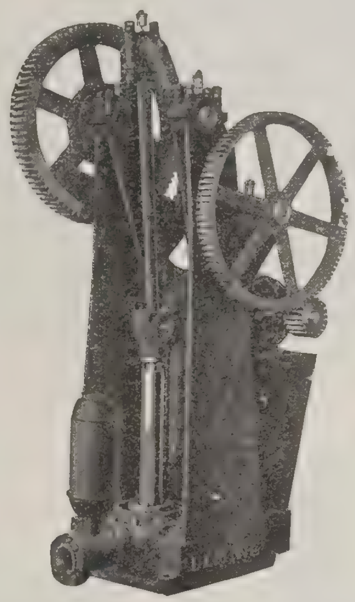


Fig. 80, 24-inch Stroke with Type "B" Drive

Fig. 62, with Differential Plunger

Fig. 62 is adapted especially for supplying water from deep wells when used in connection with one of our deep well cylinders. It is very substantially built, and the "low-down" design, as well as other features, make it the most accessible deep well pump on the market. By disconnecting the differential plunger from the crosshead and the walking beam from the connecting rod, and removing the stuffing box cap, the plunger can be readily withdrawn without disturbing the pipe connections. The stroke is adjustable, thereby permitting the easy regulation of the pump capacity to the flow of the water in the well.

Fig. 62, Sizes, Etc.

Stroke Inches.	Maximum Diameter of Pipes		Gear Ratio.	Tight and Loose Pulleys.
	Suction Inches.	Inches. Discharge		
8, 9 and 10	4½	2½	6 to 1	16x3
12, 14 and 16	6	3	7 to 1	20x5
20, 22 and 24	8	4	6⅔ to 1	28x6

Fig. 62.

Maximum Speed and Capacity per Minute with Fig. 324 Cylinder.

Diam. Cyl. Ins.	10″ Stroke		16″ Stroke		24″ Stroke		*Max. Depth of Well Feet
	Rev.	Gals.	Rev.	Gals.	Rev.	Gals.	
2¾	40	10.2	35	14.3	28	17.2	300
3¾	40	19.1	35	26.7	28	32.1	175
4¼	40	24.5					190
4¾			35	42.9	28	51.5	130
5¾			35	62.9	28	75.4	120
6¾					28	104.	60
7¾					28	137.2	45

*Refers to vertical distance from lowest surface of water in well to highest point of delivery .

Fig. 80, with Differential Plunger

This is a vertical type of working head, designed for use in wells up to 540 feet deep. Fig 62 (see illustration on opposite side of this page) is intended for use in wells up to 300 feet deep. We recommend that our Fig. 324 brass artesian well cylinder be used with these heads.

The illustrations represent the heads with Type "B" Drive, i. e., with sub-base and gearing connection for motor. Although motor is illustrated, it is not included in price on Type "B" Drive.

Fig. 80, Sizes, Etc.

Stroke Inches	Maximum Diam. of Pipes		Gear Ratio	Tight and Loose Pulleys
	Suction Inches	Dischg. Inches		
16	9	4	6 to 1	28x6
24	9	4	5¼ to 1	36x6

Fig. 80.

Maximum Speed and Capacity per Minute with Fig. 324 Cylinder.

Diam. of Cylinder Inches	16″ Stroke		24″ Stroke		*Max. Depth of Well Feet
	Revs.	Gallons	Revs.	Gallons	
4¼	35	34	28	41	540
4¾	35	42	28	51	450
5¼	35	52	28	63	360
5¾	35	62	28	75	300
6¼	35	74	28	89	250
6¾	35	86	28	104	210
7¾	35	114	28	137	150
8½	35	137	28	164	130

DEMING DOUBLE ACTING POWER PISTON PUMPS

FOR SERVICE AS GATHERING PUMPS

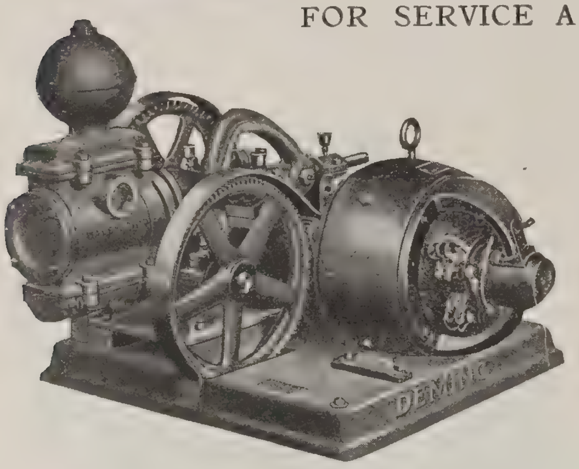


Fig. 609, "Triumph," with Type "B" Drive

General Statement

The pumps illustrated on this and the opposite page are intended for use as gathering pumps for rooms, headings, etc., and are especially adapted for this service. They can also be used to good advantage for general water supply. They may be furnished with either brass lined cylinder or with solid bronze water end. **All gears are carefully guarded.** **Type "B" Drive** includes sub-base on which both pump and motor are mounted and gearing connection between pump and motor. **Type "BA" Drive** consists of pump with gearing connection for electric motor and with the main frame altered to permit of mounting the motor on top of pump, thereby economizing space. **We can furnish motor or gasoline engine if desired.**

The "Triumph," Fig. 609

Valves: are bronze and in one piece, with stems giving large and free openings.

Gears: are machine cut.

Capacities: from 7 to 30 gallons per minute.

Can be mounted on any ordinary mine truck. The 30-gallon pump is good for a maximum head of 100 feet.

Pistons		Capacity			Maximum Head, Feet	Diam. of Pipes	
Diam. Inches	Stroke Inches	Gals. per Rev.	Usual Revs. per Min.	Gals. per Min.		Suction Inches	Dischg. Inches
2½	4½	.19	40	7.6	200	1¼	1¼
3	4½	.27	40	10.8	160	1½	1¼
4	4½	.48	40	19.2	130	2	1½
5	4½	.76	40	30.4	100	2½	2

Gear Ratio 5 to 1.

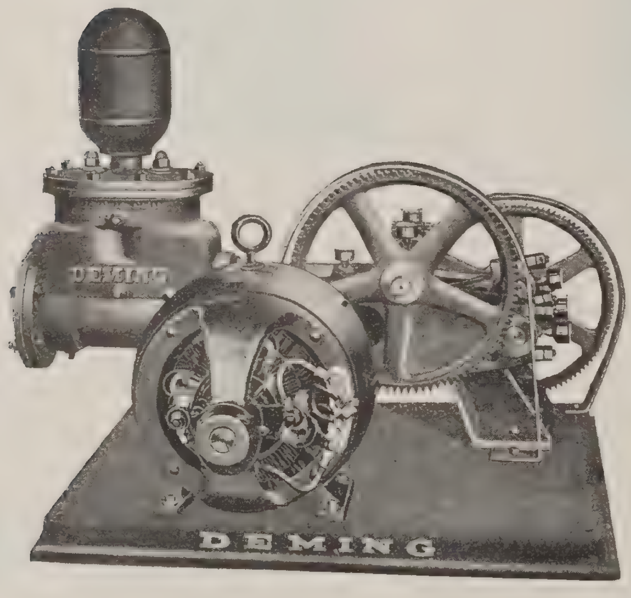


Fig. 693, "Trojan" Electric Pump with Type "B" Drive—5-inch and 6-inch Stroke. (Piston Type.)

The "Trojan," Fig. 693

Capacities: from 25 to 200 gallons per minute and for heads 150 feet or less.

Cylinders: are lined with brass or anti-acid bronze as specified, or pumps can be furnished with solid bronze water ends.

Gears: are machine cut.

Valves: are readily accessible from the top and bottom. They may be lifted through the discharge deck. Valve seats are set in firmly and without the use of threads.

Valve areas are exceptionally large.

Six Inch Stroke Pumps: usually have the motor mounted on the base beside the pump.

Ten Inch Stroke Pumps: usually have the motor mounted on top of the pump, making the outfit lighter in weight, besides keeping motor well above any water near the pump.

Gears: are machine cut.

Approximate Size of Motor Recommended.

Size Cyl.	Motor	Size Cyl.	Motor
5x5	5 H. P.	6x10	7½ H. P.
5x6	5 H. P.	7x10	10 H. P.
6x6	7½ H. P.	8x10	10 to 15 H. P.

Fig. 693, Standard Sizes, Capacities, Etc.

Pistons		Cap. per Rev., Gals.	Revs. per Minute	Cap. per Min. at Max. Speed, Gals.	Diameter of Pipes	
Diam. Inches	Stroke Inches				Suction Inches	Dischg. Inches
3½	4	.325	50 to 60	19.50	1½	1¼
4	5	.534	50 to 60	31.04	2	1½
5	5	.833	50 to 60	49.98	2½	2
5	6	1.000	45 to 55	55.00	3	2½
6	6	1.448	45 to 55	79.64	3	2½
6	10	2.395	40 to 50	119.75	4	3
7	10	3.279	40 to 50	163.95	5	4
8	10	5.275	40 to 50	263.75	6	5

Gear Ratio 6 to 1. Head—150 Feet.

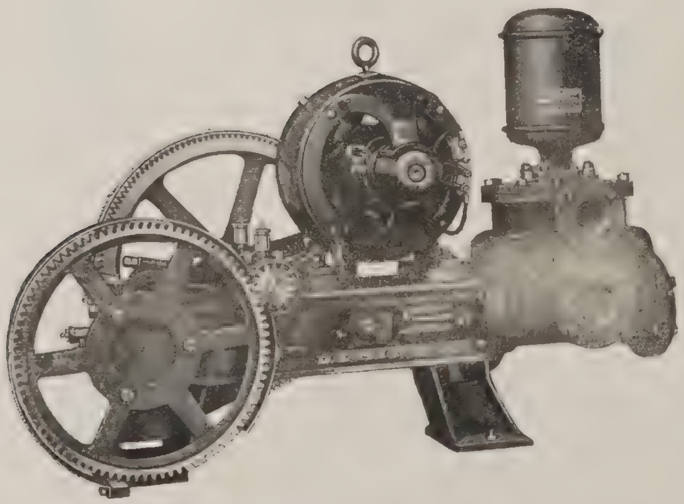


Fig. 693, "Trojan" Electric Pump with Type "BA" Drive 10-inch Stroke.

DEMING DOUBLE ACTING POWER PISTON PUMPS

FOR SERVICE AS GATHERING PUMPS

The "Neptune," Fig. 696

Capacities: 50 to 120 gallons per minute.

Valves: are of the pot valve type. They are quickly accesible from the top by loosening two nuts.

Cylinder: is bronze lined, but pump can be furnished with solid bronze water end if necessary.

This is an exceptionally good piston pump for coal mine service. Below we give the approximate size of motor recommended.

Size Cyl	Motor
5x5	5 H. P.
5x6	5 H. P.
6x6	7½ H. P.

The above is based upon a head of 150 feet.

Fig. 696, Sizes, Capacities, Etc.

Pistons		Cap. per Rev., Inches	Rev. per Min.	Cap. per Min. at Max. Speed, Gals.	Diameter of Pipes	
Diam. Inches	Stroke Inches				Suction Inches	Dischg. Inches
5	5	8.33	50 to 60	49.98	2	2
6	6	1.448	45 to 55	79.64	3	2½
6	10	2.395	40 to 50	119.75	4	3

Gear Ratio 6 to 1. Maximum Head—150 Feet.

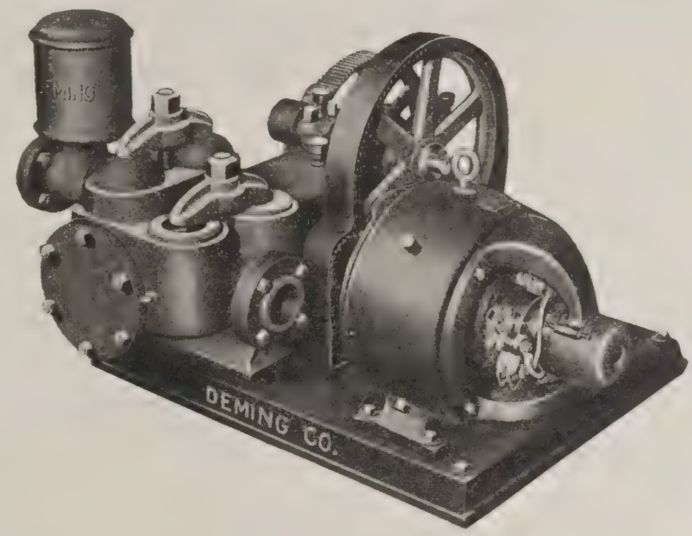


Fig. 696, "Neptune" Electric Pump, with Type "B" Drive. (Piston Type)

The "Vulcan," Fig. 604

Capacities: 13 to 65 gallons per minute.

Valves: are accessible without disturbing the pipe connections. Valve areas are large.

This is a stronger pump than the "Triumph," "Trojan," "Ajax," or "Neptune," as it is good for 250 feet total head.

Fig. 604, Sizes, Capacities, Etc.

Pistons		Cap. per Rev., Gals,	Revolutions per Minute	Cap. per Min. at Max. Speed, Gals.	Diam. of Pipes	
Diam. Inches	Stroke Inches				Suction Inches	Dischg. Inches
3	4½	.263	40 to 50	13.15	1½	1¼
4	4½	.479	40 to 50	23.95	1½	1¼
5	6	.988	35 to 45	44.46	2½	2
6	6	1.436	35 to 45	64.62	3½	3

Gear Ratio 5 to 1. Maximum Head—250 Feet.

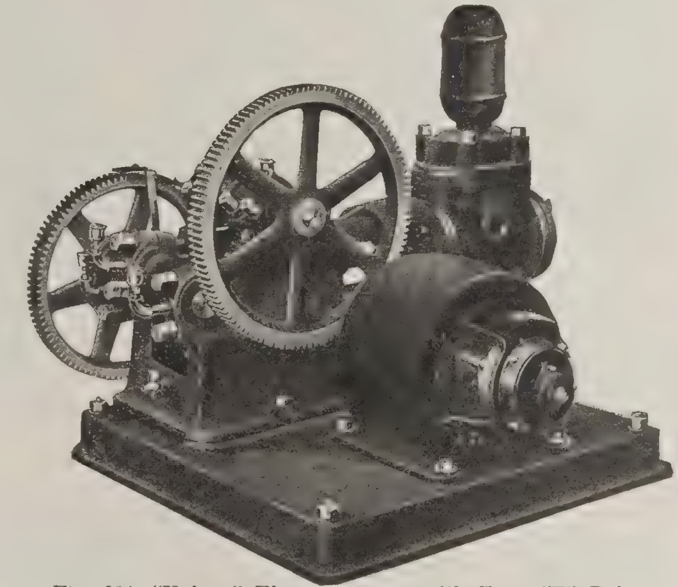


Fig. 604, "Vulcan" Electric Pump, with Type "B" Drive. (Piston Type)

The "Ajax," Fig. 716

Capacities: 30 to 215 gallons per minute.

Valves: are very easy of access. They are rubber on bronze grid seats, which are screwed into the decks.

This is a splendid pump for mine service. Below are given the approximate sizes of motors recommended.

Size Cyl.	Motor	Size Cyl.	Motor
4x5	2 H. P.	6x10	7½ H. P.
5x5	5 H. P.	7x10	10 H. P.
5x6	5 H. P.	8x10	15 H. P.
6x6	7½ H. P.		

The above estimates are based upon 150-ft. total head.

Fig. 716, Sizes, Capacities, Etc.

Pistons		Cap. per Rev., Gals.	Revs. per Minute	Cap. per Min. at Max. Speed, Gals.	Diam. of Pipes	
Diam. Inches	Stroke Inches				Suction Inches	Dischg. Inches
4	5	.534	50 to 60	31.04	2	2
5	5	.833	50 to 60	49.98	2½	2
5	6	1.000	45 to 55	55.00	3	2½
6	6	1.448	45 to 55	79.64	3	2½
6	10	2.395	40 to 50	119.75	4	3
7	10	3.279	40 to 50	163.95	5	4
8	10	4.275	40 to 50	213.75	6	5

Gear Ratio 6 to 1. Maximum Head 150 Feet.

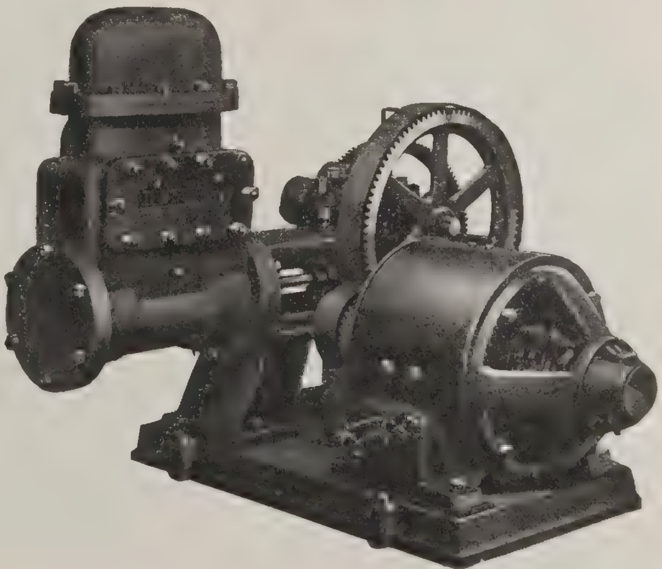


Fig. 716, "Ajax," with Type "B" Drive.

De Laval Steam Turbine Company

TRENTON, N. J.

Dravo-Doyle Co., Merchant Engineers

Sole Representatives in Pittsburgh and Cleveland

De Laval Steam Turbines and Pumps For Mine Service

De Laval Steam Turbines are of the impulse type, having large clearances, and are carefully constructed of high-grade materials. By the use of the De Laval Speed-Reducing Gear the steam turbine is employed for driving all types of machinery, including large centrifugal pumps and blowers and direct-current generators, and for rope and belt drives, the turbine and the driven machine running each at its respectively best speed.

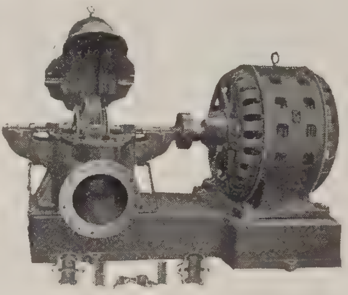
De Laval Turbine-driven Direct-current Generators are of the standard slow-speed type, with which operating men are familiar, and are free from the many troubles inherent in high-speed generators. De Laval turbine-driven alternators are of exceedingly simple and compact construction, and are either geared or directly connected, depending upon the size and frequency. They are built to suit any steam conditions, as high-pressure non-condensing or condensing, or low-pressure or mixed-flow service, utilizing the exhaust of reciprocating units.

De Laval Centrifugal Pumps are built in the single-stage and multi-stage types for all heads and capacities. Horizontally split casings give access to all parts without breaking piping connections. Leakage through the joints between the casing and impeller is minimized by removable labyrinth wearing rings. Special acid-resisting metal is employed to prevent corrosion by mine water. De Laval Geared Steam-turbine-driven Centrifugal Pumping Units hold the record for lowest cost in handling water. Due to their light weight and compactness expensive foundations and buildings are not required.

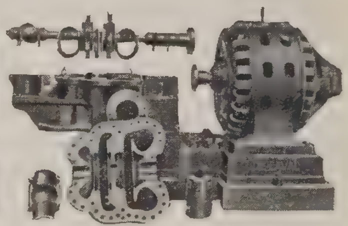
De Laval steam-turbine-driven steam plant auxiliaries, including centrifugal circulating pumps, centrifugal feed pumps and centrifugal fans and blowers are simple and compact machines requiring little attention further than to see that the oil wells are kept filled.

All De Laval apparatus is designed on conservative lines to secure reliability and long life, using low peripheral speeds, ample clearances, and stiff heavy shafts to prevent vibration. Carefully selected and tested materials are used throughout and the manufacture is carried on in well-lighted shops by skilled workmen. All parts are made to limit gages, insuring interchangeability. Each unit is fully guaranteed as to capacity and efficiency and is fully tested in our shops before shipment.

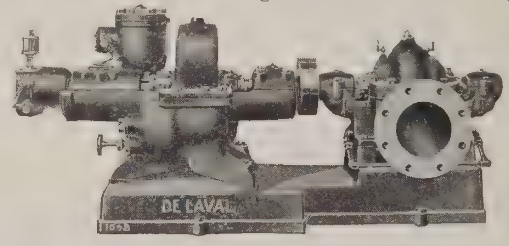
Ask for Publication No. 56 and state requirements, so that special literature may be sent.



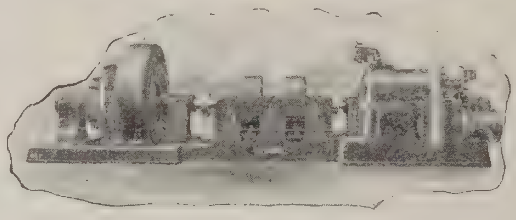
Typical De Laval Horizontal Single-Stage Pump with casing cover and bearing caps removed for inspection of internal parts.



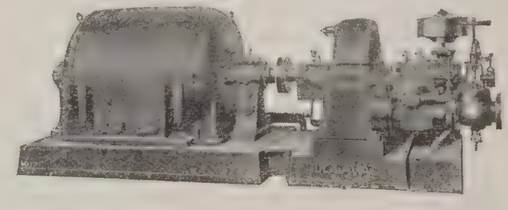
Illustrating the accessibility of all working parts of a De Laval Multi-Stage Pump; all parts are made to limit gages and are interchangeable.



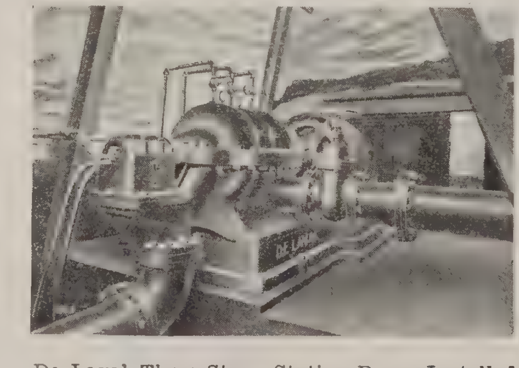
De Laval Turbine-Driven Single-Stage Pump.



De Laval 1200 kw. Multi-Stage Turbine Driving Standard-Speed Direct-Current Generator; low-pressure type for utilizing exhaust of reciprocating units.



De Laval Steam Turbine directly connected to Alternator.



De Laval Three-Stage Station Pump Installed in Coal Mine.

G. H. ELMORE

ELMORE PHILADELPHIA SCRANTON **ELMORE**

Engineer

Somers, Fitler & Todd, Pittsburgh Agents

Manufacturer of

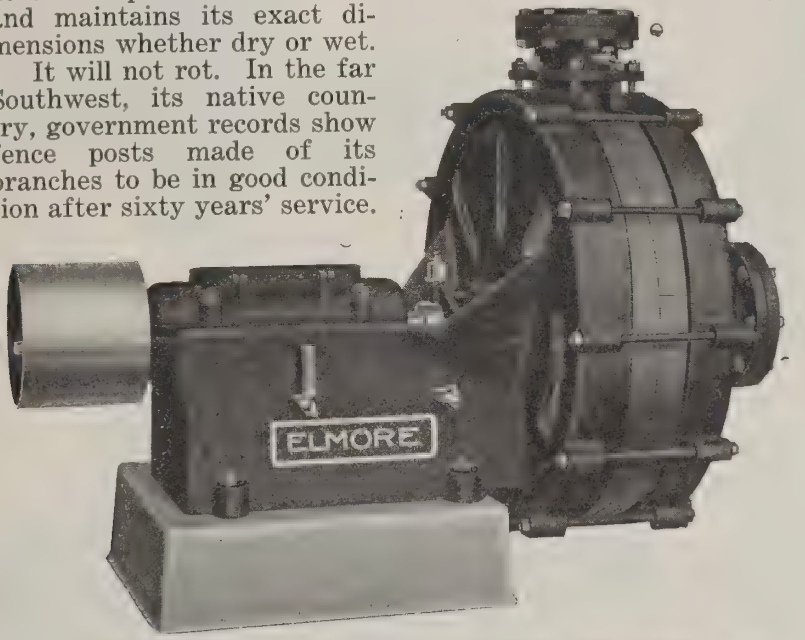
Elmore Acid-Resisting Centrifugal Pumps

An acid-resisting centrifugal pump of the volute type.

With the whole case, in which the impeller rotates, made of wood.

This wood is as hard as ebony. Moisture has no effect upon it. It will neither shrink nor swell and maintains its exact dimensions whether dry or wet.

It will not rot. In the far Southwest, its native country, government records show fence posts made of its branches to be in good condition after sixty years' service.



Acid-Resisting Centrifugal Pump, Electric or Belt Driven.

The Pump is fitted with a bronze impeller, the hub of which extends entirely through the stuffing box so that none of the liquid passing through it can come in contact with the steel shaft.

The Pump impellers are not only made of the most highly acid-resisting material, but they are so designed as to give maximum efficiency and capacity.

The actual capacities of the Pumps will be found by the users to be materially above the standard rating of volute centrifugals.

The Pump shaft bearings are dirt-proof, ring oiling, of unusual length, and in absolutely fixed alignment.

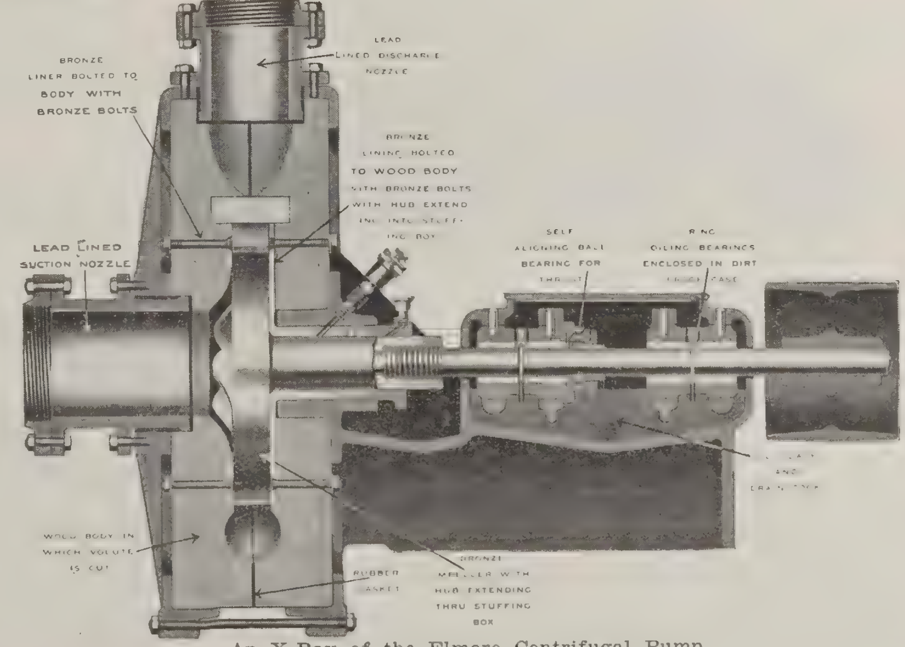
The horizontal thrust is provided for by ball bearings enclosed in the dirt-proof, self-oiling case.

ELMORE Pumps are fitted with acid-resisting bronze linings bolted to the wood, between which linings the impeller rotates. These linings are renewable and can be set out as wear takes place, thereby increasing the life of both impeller and linings, and maintaining the original efficiency in the Pump.

All parts of ELMORE Pumps are made in duplicate, and such repairs as may be required can be obtained from stock.

Repairs, in the very nature of the case, are a small item, as the main casings which hold the pumping machinery and through which the liquids pass are of a practically indestructible material, the bearings are fool-proof, and the iron frame is unusually heavy.

Although the impeller casings are made of wood, these casings are so enclosed in heavy iron housings that the Pump can be dismantled and all working parts exposed as easily and as quickly as is possible with the simplest type of Centrifugal Pump.


BRONZE LINER BOLTED TO BODY WITH BRONZE BOLTS
LEAD LINED DISCHARGE NOZZLE
BRONZE LINING BOLTED TO WOOD BODY WITH BRONZE BOLTS WITH HUB EXTENDING INTO STUFFING BOX
LEAD LINED SUCTION NOZZLE
SELF ALIGNING BALL BEARING FOR THRUST
RING OILING BEARINGS ENCLOSED IN DIRT PROOF CASE
WOOD BODY IN WHICH VOLUTE IS CUT
RUBBER GASKET
BRONZE IMPELLER WITH HUB EXTENDING THRU STUFFING BOX

An X-Ray of the Elmore Centrifugal Pump.

EPPING-CARPENTER PUMP CO.

ESTABLISHED 1866.

MAIN OFFICES AND WORKS:

PITTSBURGH, PENNA.

BRANCH OFFICES:

NEW YORK
90 West Street

CHICAGO
339 Railway Exchange

CLEVELAND
328 Champlain Ave.

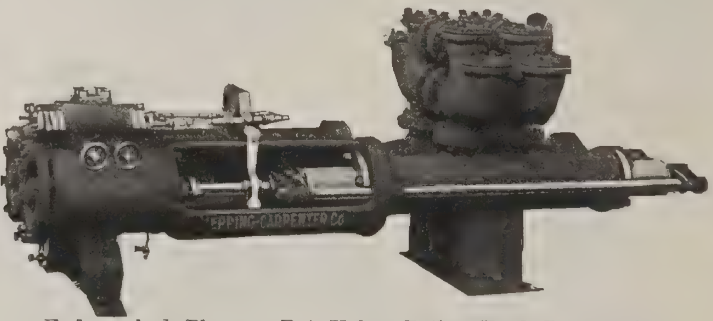
PHILADELPHIA
1108 Harrison Bldg.

Agencies in All Principal Cities.

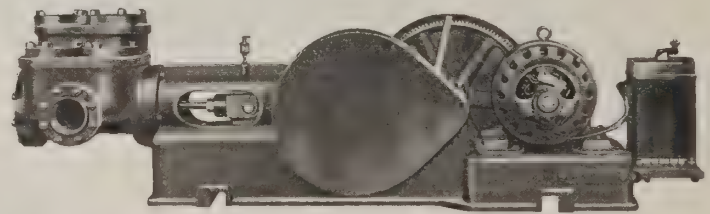
Manufacturers of Steam, Power & Centrifugal Pumps

HIGH DUTY PUMPING ENGINES AND CONDENSERS

We have complete line of patterns for every condition of service for Mine Work, including steam driven with simple, compound, and triple expansion steam end, equipped with all accessories and jet condenser.



End Packed Plunger Pot Valve Boiler Feed Pump with Patented Balanced Piston Steam Valves and Outside Lost Motion Adjustment.



BULL DOG Electric Driven Mine Gathering Pump.

Steam Driven Mine Pump. Compound Steam Cylinders with Piston Valves—Wood Lined.

Send specifications, giving conditions of service, and we will submit a proposition with recommendations for machinery for the service.

High Efficiency Electric Driven Mine Pump. Herringbone Gears. Wood Lined.

Fifty-one Years in Business. **Over 13000 Pumps in Service.**

FAIRMONT MINING MACHINERY CO.

Regular Equipment.

- Tipple Structures
- Screens and Chutes
- Loading Booms
- Picking Tables
- Conveyors—all types
- Cable Car Hauls
- Chain Car Hauls

General Offices and Works

FAIRMONT W. VA.

TRADE MARK REGISTERED
FAIRMONT
101-20
(The Mark of Quality.)

Specialties

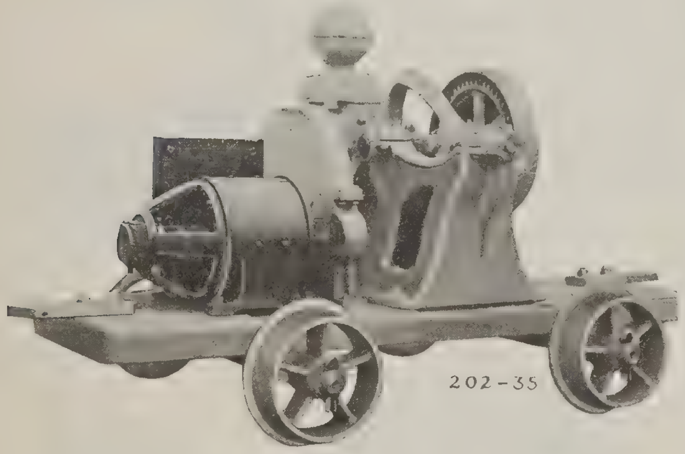
- Steel Mine Ties
- R. R. Car Retarders
- Portable—
- Electric Mine Pumps
- Power Coal Augers
- Box Car Loaders
- Mine Car Trucks

COAL MINE EQUIPMENTS

Fairmont Portable Electric Mine Pump

We are the originators of the Mounted Portable Electric Pump for gathering purposes in coal mines. Capacity and quality unequaled at the price, and more gallons pumped per dollar of expense for power and repairs. Five years of success.

We lead—others follow.



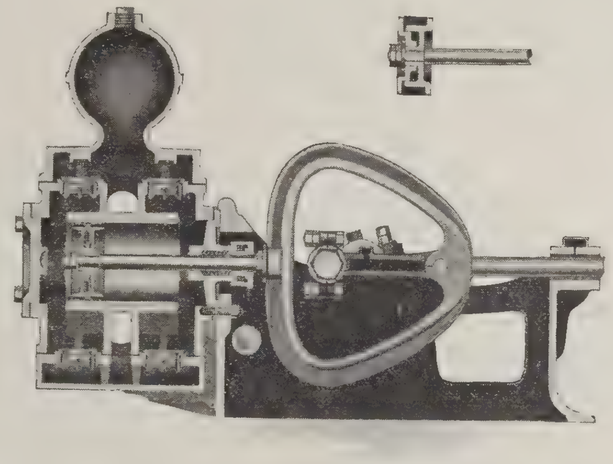
The above illustration shows an ideal outfit for mine use. The total weight, including wheels and axles, is only 1500 lbs., and exclusive of wheels and axles 1100 lbs. (Can be lifted off of axles and set to one side.)

Over-all height above top of rail, with 14-inch wheels for truck, is 41 inches. On 10-inch wheels 39 inches.

The pump and all parts are strongly constructed throughout (especially for mine use), and put out under our usual guarantee of satisfaction or no pay.

This is, by all means, the neatest and cheapest outfit on the market today, and you cannot afford to let the opportunity go by of giving it a trial.

We use General Electric type R. C. or C. V. C. Self-Starting Motors, and no starting rheostat is needed. Whenever the current goes off for a few minutes it is not necessary, with this arrangement, to send a man in to start the pump when the current comes on again. Any mine superintendent can appreciate this convenience.



Special Features in "Fairmont" Pump

Crank Shaft—steel, drop forged.

Yoke—cast steel, annealed.

Connecting Rod—malleable iron, brass bushed on both ends.

Piston Rod—bronze, with bronze nuts.

Cylinder Liner—¼-inch thick, acid-resisting bronze.

Valves—acid-resisting bronze.

Valve Seats—acid-resisting bronze.

Stuffing Box—acid-resisting bronze.

Drain Plugs—acid-resisting bronze.

Plunger Irons—acid-resisting bronze when conditions require.

Standard Irons—are cast iron.

Motor Pinion—forged steel, cut teeth.

All Other Gears—cast iron with cut teeth.

All gears and pinions completely enclosed **SAFETY FIRST.**

Gears—are properly guarded.

Bearings—are cast babbited with oil chamber, thus eliminating the use of oil cups, which are always easily broken off.

Bronze Water End—complete for severe conditions.

Motor—two or three H. P., as desired by purchaser, any voltage.

RESULTS OF ACTUAL TESTS

Speed of Motor 1100 r. p. m., Pump Gear 100 teeth.

No. Teeth in Motor Pinion	R. P M of Crank	Volts	Amp.	H. P	Gal. per Min.	Head in lbs.	Head in ft.
15	59	230	8.5	2.62	35.33	50	115.5
"	59	230	6.0	1.85	41.34	30	69.3
"	72	234	3.5	1.10	46.77	1.72	4.0
17*	67	230	9.6	2.97	40.04	50	115.5
"	67	230	6.8	2.10	46.85	30	69.3
"	82	230	4.0	1.25	53.01	20	46.2
21	78	230	3.0	4.00	50.03	50	115.5
"	78	234	9.0	2.82	56.03	30	69.3
"	82	230	8.0	2.47	59.56	20	46.2
"	85	230	6.5	2.00	62.81	15	34.6

* Standard Gear Ratio.

In making above tests the discharge line consisted of 20 feet of 2 inch pipe with three elbows and two globe valves

GOULDS MANUFACTURING CO.

Branch Offices:
BOSTON
NEW YORK
CHICAGO
PHILADELPHIA

MAIN OFFICE AND WORKS:
SENECA FALLS, NEW YORK

Pumps for Every Service

District Offices:
PITTSBURGH
ATLANTA
HOUSTON
BALTIMORE
CLEVELAND

Products

Double-acting Piston Pumps.	Bulletin No. 100
Triplex Plunger Pumps, Outside Guided.	" " 101
Triplex Plunger Pumps, Trunk Plunger Type	" " 102
Single-acting Triplex Plunger Pumps, large capacity type.	" " 103
Double-acting Triplex Piston Pumps.	" " 104
Single-stage, Single Suction Centrifugal Pumps.	" " 105
Vacuum and Stuff Pumps.	" " 106
Deep Well Triplex Pumps.	" " 107
Deep Well Working Heads.	" " 108
Portable Mine Pumps	" " 109
Single-stage, Double-suction Centrifugal Pumps	" " 110
Centrifugal Sump Pumps.	" " 111
Handy Data on Power Pumping.	" " 112
Vertical Centrifugal Pumps.	" " 114
Double-Acting Triplex Pumps, Horizontal Type.	" " 115
Triplex Pressure Pumps.	" " 116
Air Pressure and Vacuum Pumps.	" " 117
Centrifugal Fire Pumps.	" " 118
Single Stage, Single Suction, Centrifugal Pumps, Enclosed Impeller Type	" " 119
Multi-stage Centrifugal Pumps	" " 120
Diaphragm Pumps	" " 121

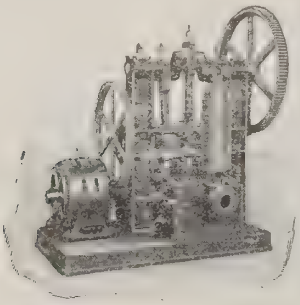


Figure 1009. Single-Acting Triplex Pump with Gear-Connected Motor.

Single-Acting Triplex Plunger Pumps—Outside Guided.

Fig. 1009 is a small and moderately large capacity type for unwatering mines, suitable for elevations up to 350 feet. Furnished in capacities up to 350 gals. per minute. Can be furnished with tight and loose pulleys for belt drive or for gear or direct connection to the driving motor. See Bulletin 101.

Fig. 1585 is a high pressure type made for elevations of 230 to 3500 feet and for capacities of 51 to 1152 gals. per minute. It can be equipped for any of the Standard methods of connecting to the driver. Bulletin 103.

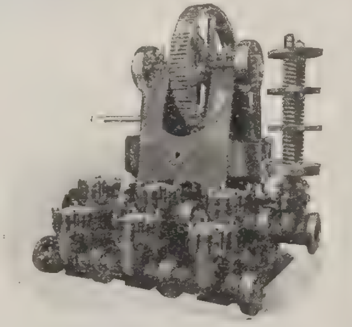


Fig. 1585.

Double-Acting Triplex Plunger Pumps

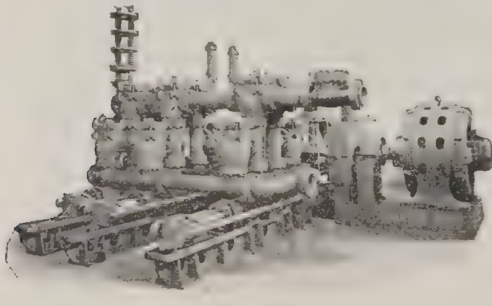


Fig. 1521.

Fig. 1521 is a horizontal type double acting pump, made in large capacities for high elevations. Can be supplied to meet almost any condition. Designed so that when installing parts can be lowered down an ordinary mine shaft. Bulletin 115. Vertical type double-acting piston pumps for low elevation, large capacity service, described in Bulletin 104.

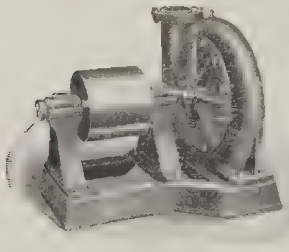


Fig. 3000.

Centrifugal Pumps

Figure 3000 is a single-stage single side section centrifugal pump, suitable for elevations up to 100 feet including pipe friction head. Its extreme simplicity makes it especially suitable for mine service. Can be furnished with pulley for belt drive as shown or for direct connection to electric motor. See Bulletin 105.

Fig. 3030 is an extra high grade single stage double suction centrifugal pump for elevations up to 150 feet including pipe friction head. Fully described in Bulletin 110.

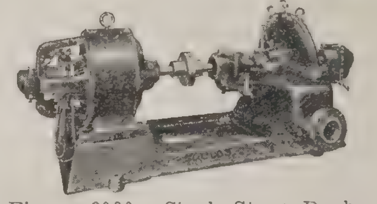


Figure 3030. Single-Stage Double Suction Centrifugal Pump with Direct Connected Motor.

Fig. 3300 is a multi-stage centrifugal pump suitable for elevatios up to 700 feet. Built in 2, 3, 4 and 5 stages and 4, 5, 6 and 8 inch sizes with capacities ranging from 200 to 1500 gallons per minute.

Described in Bulletin No. 120.

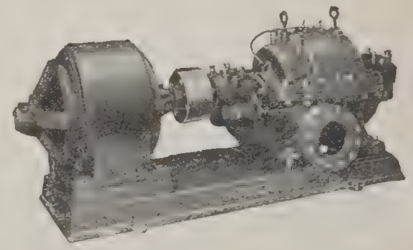


Figure 3300. No 8. Two-Stage Direct Connected to Electric Motor.

Portable Triplex Electric Sump Pumps

Fig. 1637 is a portable triplex pump with outside guided plungers for unwatering mine sumps. Has all-iron truck with adjustable axles, which can be used on any gauge track. For heads up to 500 feet. Capacity 65 gals. per minute. Can be used as station pump by mounting on bed-plate instead of on truck. Bulletin 109.

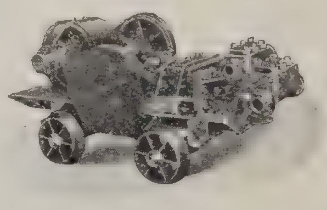


Fig. 1673.

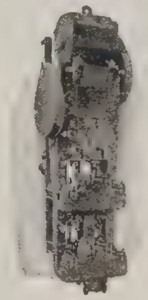


Fig. 1237. Duplex Electric Sinking Pump.

Sinking Pump

Fig. 1237 is a sinking pump for service in mine shafts. All parts are so protected that the pump will withstand any amount of hard usage. Frame is provided with wrought iron hanging bars for suspending the pump in the shaft. Bulletin 109.

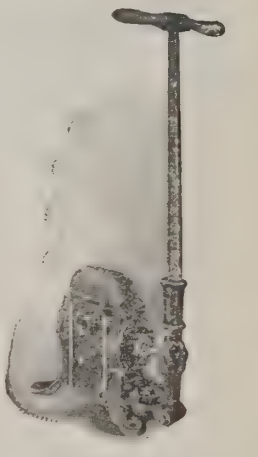


Fig. 470 "Challenge" Double Acting Force Pump.

Double-Acting Force Pump

Fig. 470 is a type of hand pump used largely in mines for supplementary service. Made in five sizes, with capacities from .19 to 1.28 gals. per revolution. Will lift and force 100 to 150 feet. Can be furnished with two handles if desired.

Power Diaphragm Pump

Fig. 1649 is a handy portable pump fitted with engine gear and pinion with small gasoline engine on either frame or truck. Is also furnished with pulley for belt drive and is then known as Figure 1642. Capacity 3,500 gals. per hour. Will lift 20 feet. Bulletin 121.

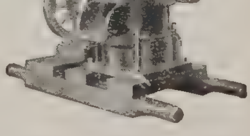


Fig. 1649. Power Diaphragm Pump.

KINGSFORD FOUNDRY AND MACHINE WORKS

OSWEGO, N. Y. U. S. A.

Centrifugal, Turbine and Volute Pumps, Water Tube and Marine Boilers

Products

Centrifugal Turbine and Volute Pumps. Internally Fired, Water Tube and Marine Boilers.

Pumps for mine work can be furnished for heads exceeding 3000 feet for electric motor or steam turbine drive. The pump shown in Fig. 188 is working against a head of 2620 feet and shows a very high efficiency.

Our pump for shaft work and designed for unwatering a mine is of our vertical multi-stage type for motor turbine drive. Pumps for Pit and Washery work are very rugged in construction and will handle water carrying a large percentage of solids. These pumps are made in all sizes for belt, motor or turbine drive, and is shown in Fig. 191, direct connected to steam turbine.

The Kingsford Dredging Pump is made in sizes ranging from 4″ to 20″ and will handle solids without perceptible wear and is favorite for handling coal and screenings. Like all the pumps of our make it can be driven by belt or motor.

Catalogues covering our complete line of manufacture will be forwarded on request.

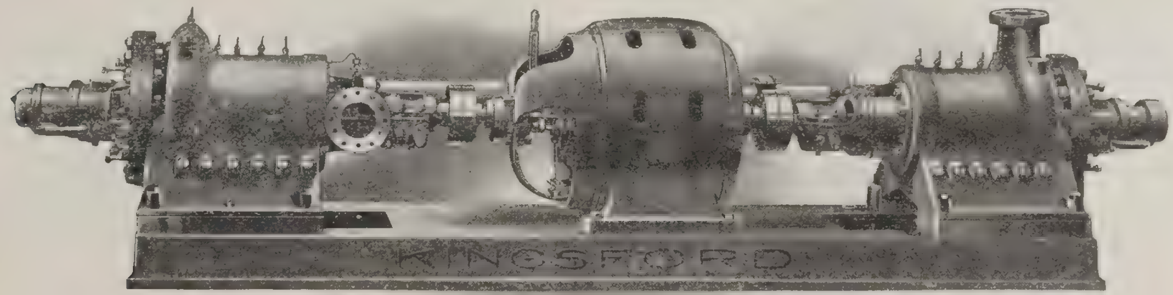


Fig. 188.

Fig. 188 represents our 12″ Twelve Stage High Duty Pump, designed for heads up to 3000 feet.. The pump shown is working under a head of 2620 feet, delivering 1350 G. P. M. at a speed of 1480 R. P. M.,requiri ng 1200 H. P. This type of pump is generally constructed with the shell or casing and the internal parts of acid resisting bronze. The from of construction followed by us in this type of pumps is the strongest that can be devised and has given perfect satisfaction under extremely high heads. Pumps with larger or smaller capacities than the one shown can be furnished promptly.

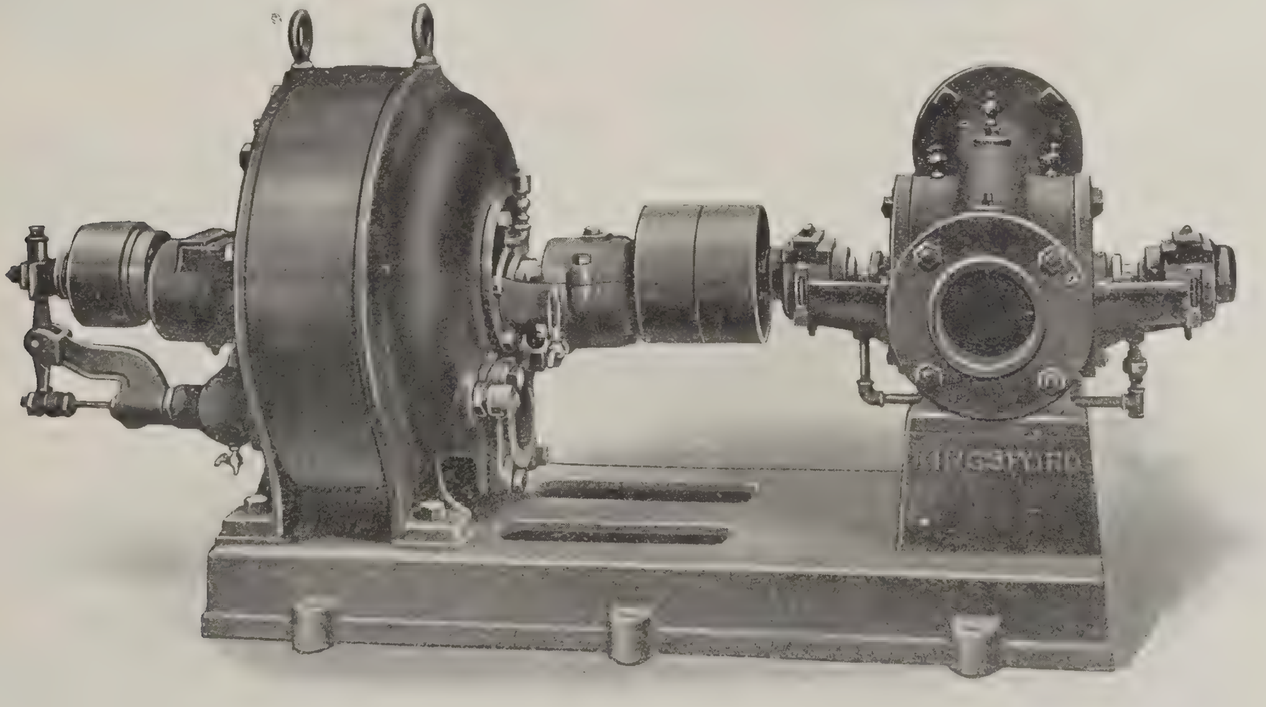


Fig. 191.

The pump shown in Fig. 191 direct connected to steam turbine is our Double Flow Type N, and is suitable for heads up to 200 feet, and shows avery high efficiency. This pump is hydraulicly balanced against end thrust and is designed for high speed drive either direct connected or by belt. It possesses many important features found in no other make and it without question the most efficient medium left pump on the market. This pump can be had in sizes ranging from 50 to 3000 gallons per minute.

MORRIS MACHINE WORKS

BALDWINSVILLE, NEW YORK.

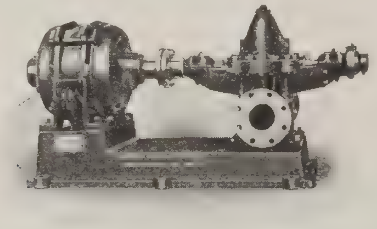
PITTSBURGH: Harris Pump & Supply Co.
NEW YORK: 39-41 Cortlandt St.
CHICAGO: Henion & Hubbell.
CHARLOTTE, N. C.: Realty Bldg.
BRANCH OFFICES IN PRINCIPAL CITIES.

Products

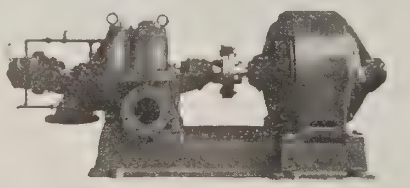
Centrifugal Pumping Machinery, Hydraulic Dredges, Stationary and Marine Engines.

Horizontally Split Single and Multi Stage Pumps

This type of Pump meets the demand for an efficient pump capable of operating at high speeds for direct connection to electric motor or steam turbine. Where the head is high it is built in stages. The suction and discharge opening are cast in the bottom half so that the pump can be taken apart without disturbing the pipe lines. The enclosed impellers are of bronze, accurately finished and balanced for high speeds. The shaft is of steel, protected by bronze sleeves through the stuffiing boxes. These pumps are equipped with outboard ring oiling bearings with removable babbited sleeves. The multi stage pumps have a water cooled marine type thrust bearing running in oil. The single stage pump is of the double suction type and whatever slight thrust develops is compensated by S. K. F. ball bearings. Leakage between stages is prevented by labyrinth impeller rings, which also maintain the efficiency of the pump.



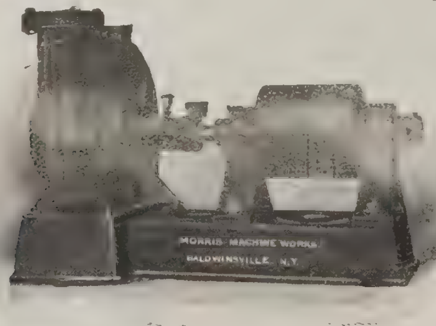
4″ Horizontally Split Single Stage Pump.



6″—2 Stage Hor. Split Multi Stage Pump.

Standard Horizontal Pumps

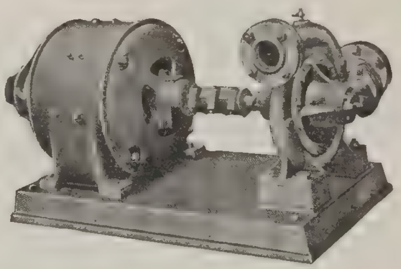
This pump is the type most extensively used for general work, and is especially adapted for Coal Mine duty on low lifts. There is a substantial babbitted bearing on each side of the pulley, which can be furnished of the ring oiling type if desired. The shaft is of large diameter, made of turned steel. The stuffing box is deep and arranged with gland. Sizes 1″ to 12″ inclusive are carried in stock.



Standard Horizontal Pump.

Double Suction Mine Pumps

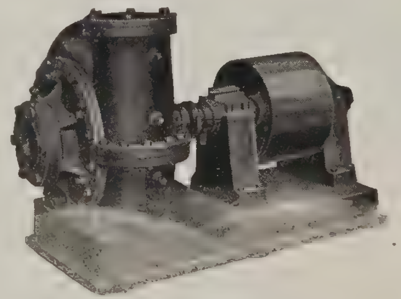
This class of pump is built with a vertical split shell in the 1″ to $1\frac{3}{4}$″ sizes and with a solid shell, as illustrated, in the larger sizes. Because of its small diameter impellers it is an excellent pump for high speed. These outfits are built of all iron; bronze fitted, that is with bronze shaft, impeller and gland; or of all bronze where the water is particularly bad. All types of Morris Pumps can be furnished as above. We use an anti-acid bronze for all pumps used in the Coal Fields.



Double Suction Mine Pump.

Solid Lined Dredging Pump

This pump was originally designed for handling slimes in connection with gold recovery plants. The lining, which is practically an independent pump, is made either of Manganese Steel or Hard Cast Iron as desired. The impeller is of the enclosed type and of the same material as the liner. The bearings have removable babbited sleeves. For handling gritty water, coal, ashes, sand gravel, etc., this pump is unexcelled. It is built in sizes from two to twelve inches, some of which are carried in stock.



Solid Lined Dredging Pump

There Are Nearly 50,000 Morris Pumps In Service.

PLATT IRON WORKS

DAYTON, OHIO

Representatives in Principal Cities Insure Prompt and Efficient Service

Products

"Stilwell" Feed Water Heaters, Hot Water Service Heaters; "Smith-Vaile" Air Compressors, Steam Pumps, Power Pumps; "Platt" High Duty Pumping Engines, Centrifugal Pumps, Turbine Pumps; "Victor-Francis" Low Head Water Wheels, High Head Water Wheels, Tanks and Heavy Plate Work.

No matter whether they are installed under the most favorable conditions or in the most isolated parts of the world, Platt products are pre-eminent for quality and service.

Platt Double Suction Centrifugal Pumps

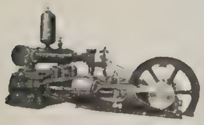
Casing of hard, close-grained cast iron or other suitable metal. Lower part of casing is cast in one piece, giving strength and rigidity under operating conditions.

Impellers are especially designed to meet conditions under which they are expected to work.

Casing is split horizontally on the center line of the shaft. Lifting off of the top and bearing caps allows the removal of all rotating parts without disturbing the suction or discharge connections.

Interchangeability is guaranteed. Every pump tested under working conditions before shipping, besides given a static test under much higher pressure.

Smith-Vaile Compound Duplex Pumping Engines.

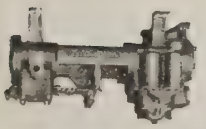


For high economy installations we furnish pumping engines for all conditions of service.

Economy in consumption of steam by means of multiple expansion is accomplished by compounding the steam cylinders. The undeveloped energy of the steam after the completion of the stroke in the initial cylinders is conserved and employed in the expansion cylinders, and a saving of from 25 to 33 per cent effected.

We can meet your requirements on Direct Acting Triple Expansion, Meyer Valve Gear or Corliss Pumping Engines.

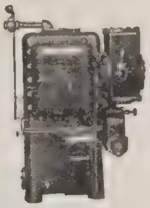
Smith-Vaile Boiler Feed Pumps



Duplex Pattern. Piston Packed Type. Yoke Style.

The suction valves are located in separate chambers and the discharge valves immediately beneath the airdome. This construction allows ready access to all valves with minimum loss of time. These features provide a heavy, accessible and most durable type of pump.

Stilwell Feed Water Heaters



A Feed Water Heater.
A Feed Water Purifier.
A Condensation Receiver.
A Feed Water Softener.

Stilwell Heaters are complete with accessories for controlling the raw water supply automatically, for proper heating of the water, for filtering and purifying both steam and water.

Steam is purified on entrance to heater by specially designed oil separator, ample space is provided for steam passage without causing back pressure. Steam travels through heater countercurrently to flow of water.

Amount of raw water is automatically controlled by balanced valve operated by non-waterlogging float.

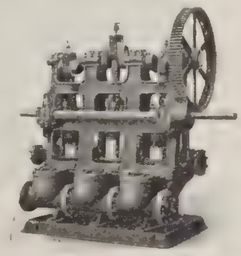
Stilwell Heating Pans are self-locking and cannot be dislodged by steam pulsations, yet readily removed through cleaning door.

Double filtration of the up and down type effectively removes mud, sand, etc.

Water sealed overflow for no back pressure systems, trapped overflow for systems, carrying back pressure.

Every heater is tested in factory before shipping.

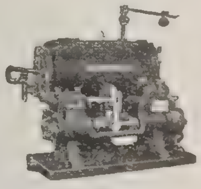
Smith-Vaile Triplex Pumps



Belt Drive. Chain Drive.
Direct Geared.

Four crank shaft bearings insure a continuous service that cannot be attained in a pump of other design. May be belt driven from any available source of power, or direct connected by coupling, gears, or chain to any form of motive power.

Automatic Boiler Feed Pumps and Receivers



The combined Automatic Receiver and Feed Pump illustrated on this page is designed primarily to drain heating systems and automatically deliver to the boilers the water of condensation in its hottest condition. It is, therefore, a necessary and economical apparatus.

Both receiver and pump are mounted on a cast iron base, the height of receiver being restricted so that it affords a drain for the lowest pipe or radiator.

The Pneumelectric Machine Company

SYRACUSE, N Y

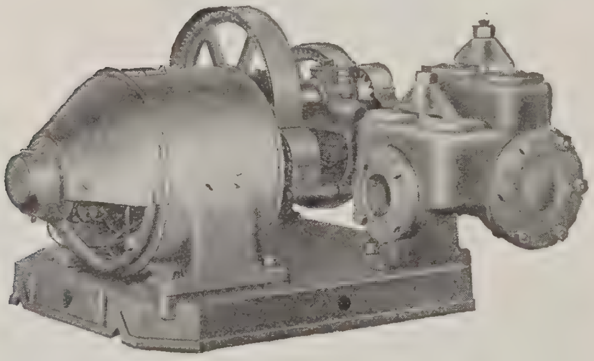
Pneumelectric
TRADE MARK

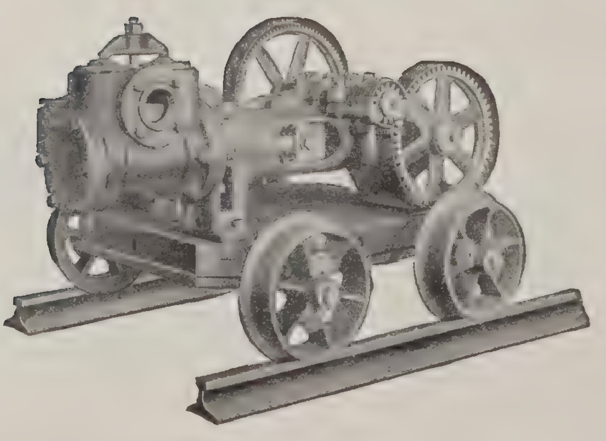
Electric Gathering Pump

Designed From the Experience of Many

The Pneumelectric Gathering Pump embodies the ideas of many practical mine men as to what a mine pump for gathering service should be.

It represents the use of materials based upon the most modern scientific investigations relating to the selection of the best materials for the service to be rendered. This being especially exemplified in the acid resisting metal that is used.





Special Features that Have Been Highly Developed

The design embodies extreme simplicity, accessibility, and construction that guarantees economical operation without interruption.

The lubrication of all bearings is made practically, automatic by means of felt wipers in oil reservoirs of ample capacity. This system assures positive lubrication at all times with the proper amount of oil, but at the same time, is most economical of the lubricant.

All bearings have replaceable bushings of highest grade bronze.

The cross head is of the high speed engine type with adjustable bronze shoes.

The crank shaft is a one-piece forging with all bearing surfaces ground to dimensions.

Service tests of long duration and under extreme conditions have demonstrated the superiority of the acid resisting metal of which the water end is made.

Motor

The Pneumelectric Gathering Pump is designed to be driven by a self starting motor, and can be furnished with any of the standard makes of 3 or 5 H. P. motors of this type.

Water End

For highly acid water, the solid bronze water end and fittings are recommended. For less severe water conditions, either a cast iron or a cast iron bronze lined water end can be furnished.

Capacity

Sixty gallons per minute, against 150 foot head, the pump being 5″x6″ double acting piston type.

Dimensions

Height—25″, Length—49″, Width—45″, Weight—850 Lbs. without motor; 1250 Lbs. with 3 H. P. motor.

Reineke-Wagner Pump & Supply Co.

416 AND 418 FIRST AVENUE
PITTSBURGH, PA.

Dealers in

PUMPS FOR ALL PURPOSES

Pipe, Valves, Fittings and General Supplies

RUMSEY Triplex Pumps

furnished in sizes to handle any amount of water as required up to 3000 gallons per minute.

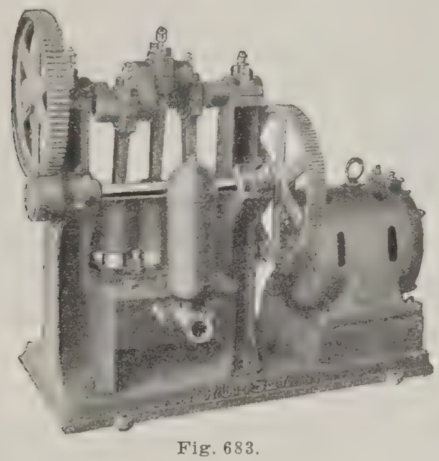
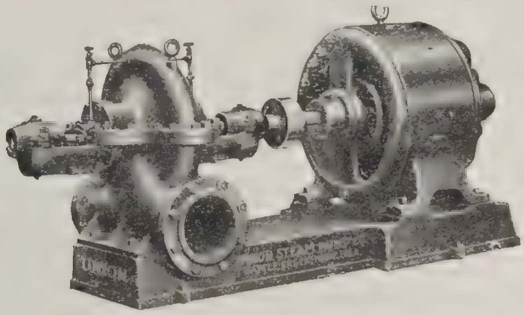
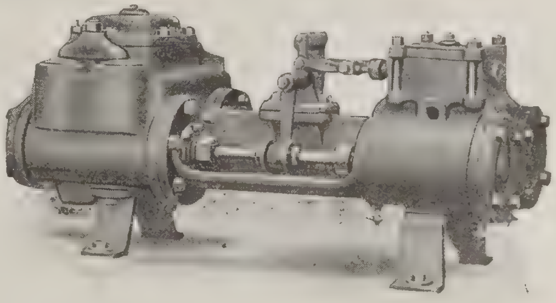


Fig. 683.

Centrifugal Pumps
for any service and for any capacity required.



Steam Pumps
for Boiler Feeding or General Service built in many sizes and styles, suitable for any place where a steam pump can be used.



Rumsey "Excelsior" Double-Acting Force Pumps.

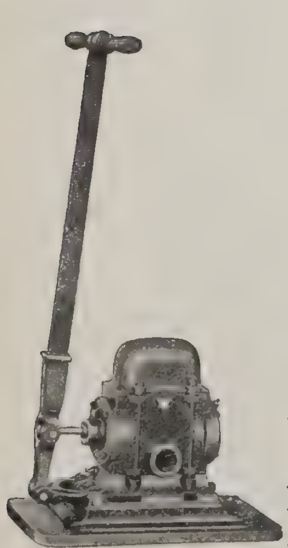


Fig. 275, No. 1.

"Excelsiors" are powerful force pumps, durable and easily operated. Non-corrosive working parts adapt these pumps to handling sea or mine water.

Their construction is simple and they are readily overhauled. They are regularly made with brass-lined cylinder, bronze valves and seats, brass cased rod and brass gland. Priming plugs and drip plugs are provided.

No.	Cylinder Diameter Inches	Stroke Inches	Capacity Per Rev. Gallons	Pipe Sizes Inches	Approx. Weight Pounds	BRASS LINED	
						Cipher	List
Fig. 275.							
1	3	5	0.30	1¼	107	Bigotry	**$28.00**
2	4	5	0.54	2	117	Bijou	**30.00**
3	5	5½	0.93	2½	177	Bilbo	**40.00**
4	6	5½	1.34	2½	203	Bilge	**50.00**
Fig. 274.							
1	5	5½	0.93	2½	217	Bimanous	$45.00
2	6	5½	1.34	2½	232	Binary	55.00

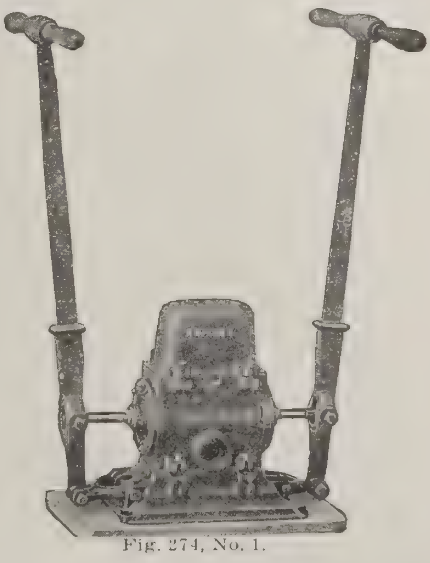


Fig. 274, No. 1.

GENERAL ELECTRIC COMPANY

General Offices:
Schenectady N. Y.

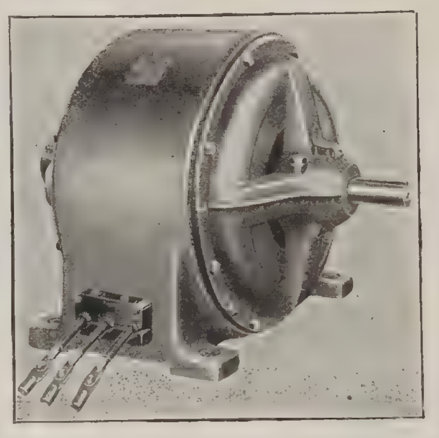
The Guarantee of Excellence
on Goods Electrical

Sales Offices
In All Large Cities

Electrical Equipment for Mines---Motors for Pumps

Dripping water, moisture saturated air and infrequent expert inspection are conditions under which mine pumps must operate. To prevent flooding, absolute reliability of operation is demanded of these pumps.

The General Electric Company has designed a special line of motors which are fully protected from these operating conditions.



Centrifugal Pump Motor.

Rigid box type frames enclosing moisture resisting windings give these motors the needed protection against water and humidity, and these windings are effectively cooled by self-ventilation.

Split end shields and bearings increase the accessibility of these motors for inspection while ample bearing surfaces and capacious oil wells make frequent examination unnecessary.

Absolute reliability of operation for these motors is assured by the above features as well as their ample overload capacities and reliable oiling devices.

Electric welds used in G-E squirrel cage pump motors between each rotar bar and its end rings give a joint capable of withstanding any overload temperature up to the melting point of the copper rotar bars.

Reliability of operation for the Form M Motor is further assured by drum type controllers and resistance of the well known G-E maximum service types. Each of these devices is fully protected from the severe operating conditions found in mines.

In order to reduce the size of these motors to make them suitable for installation in small places, without reducing their power capacities and to adapt them to centrifugal pump speeds high motor speeds are used.

Both high efficiencies and power factors have been maintained.

RATINGS OF HIGH SPEED,
INDUCTION MOTORS FOR DIRECT CONNECTION
TO CENTRIFUGAL PUMPS.—BOX FRAMES, 60 CYCLES.

Form K—Constant Speed.				**Form M—Slip Ring Type.**			
2240—440—550—2200 Volts.				220—440—550—2200 Volts.			
H. P.	Syn. Speed	Approx. Full Load Speed	Approx. Shipping Weight with Comp.	H. P.	Syn. Speed	Approx. Full Load Speed	Approx. Shipping Weight with Control
75	1800	1750	1790	75	1800	1740	2360
100	1800	1750	2350	100	1800	1745	2750
150	1800	1750	2840	150	1800	1745	8340
200	1800	1760	3660	200	1800	1750	3950
250	1800	1760	4900	250	1800	1755	4930
300	1800	1765	5900	300	1800	1755	5720
350	1800		6880	350	1800	1755	7180
75	1200	1160	2340	75	1200	1165	2660
100	1200	1165	2700	100	1200	1170	3340
150	1200	1170	3660	150	1200	1170	3860
200	1200	1165	4700	200	1200	1170	4760
250	1200	1170	5600	250	1200	1170	5720
300	1200	1170	7300	300	1200	1170	7180
200	900	870	4650	200	900	870	4900
250	900	870	7200	250	900	870	7350
300	900	870	8200	300	900	870	8070

WESTINGHOUSE ELECTRIC & M'F'G CO.

EAST PITTSBURGH, PA.

SALES OFFICES

Atlanta, Ga.
Baltimore, Md.
Birmingham, Ala.
Bluefield, W. Va
Boston, Mass.
Buffalo, N. Y.
Butte, Mont.
Charleston, W. Va.
Charlotte, N. C.
Chicago, Ill.
Cincinnati, Ohio.
Cleveland, Ohio.
Columbus, Ohio.
Dallas, Tex.
Dayton, Ohio.
Denver, Colo.
Detroit, Mich.
*El Paso, Tex.
*Houston, Tex.
Indianapolis, Ind.
Joplin, Mo.
Kansas City, Mo.
Louisville, Ky.
Los Angeles, Cal.
Memphis, Tenn.
Milwaukee, Wis.
Minneapolis, Minn.
New Orleans, La.
New York, N. Y.
Omaha, Neb.
Philadelphia, Pa.
Pittsburgh, Pa.
Portland, Ore.
Rochester, N. Y.
St. Louis, Mo.
Salt Lake City, Utah.
San Francisco, Cal.
Seattle, Wash.
Spokane, Wash.
Syracuse, N. Y.
Tacoma, Wash.
Toledo, Ohio.
Washington, D. C.

*W. E. & M. Co., of Texas.

Products

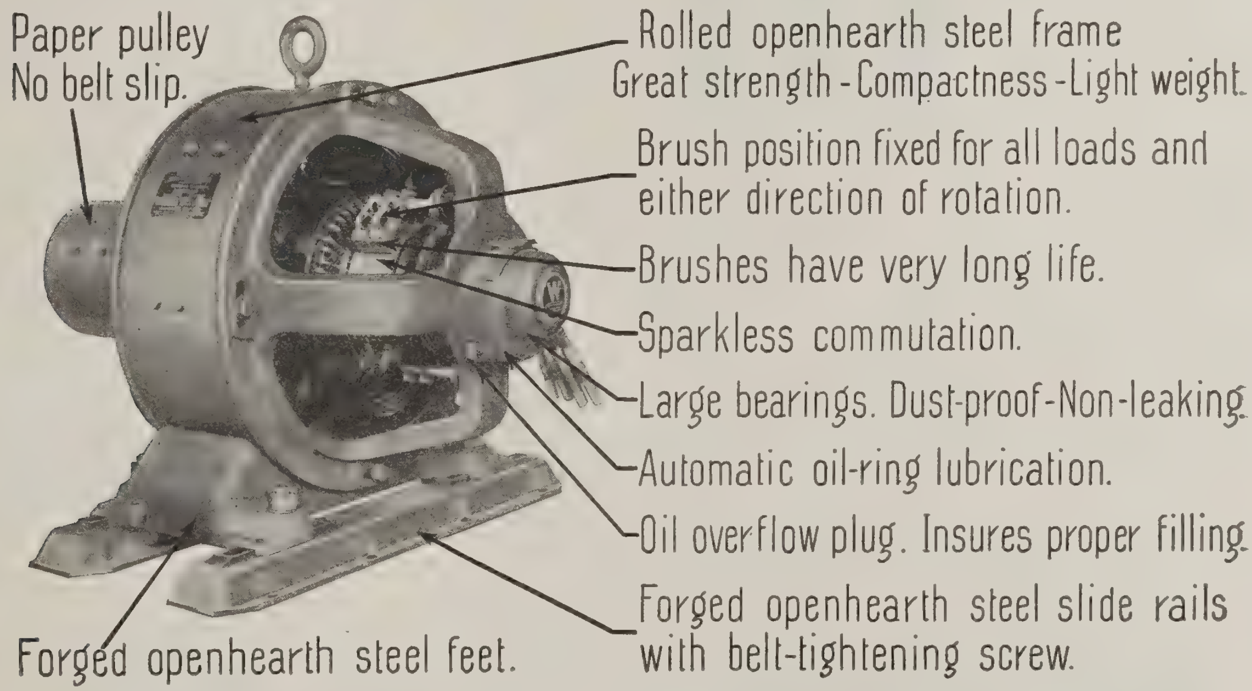
Electrical Equipments for all mining apparatus.

"The SK for Mine"

This is what the Superintendent, or Manager, who has used it says—

Because the following features make it the best motor for driving Pumps, Fans, Crushers, Hoists, Shaker Screens, Tools, Conveyors, Washers and Dumpers.

Write to a user and ask him how the SK is doing in his mine, tipple or shop.


Paper pulley
No belt slip.
Rolled openhearth steel frame
Great strength - Compactness - Light weight.
Brush position fixed for all loads and either direction of rotation.
Brushes have very long life.
Sparkless commutation.
Large bearings. Dust-proof - Non-leaking.
Automatic oil-ring lubrication.
Oil overflow plug. Insures proper filling.
Forged openhearth steel slide rails with belt-tightening screw.
Forged openhearth steel feet.

Direct Current Type SK Motors

Shunt or Compound Wound. Open Type. Constant Speed

230 VOLTS.

H. P.	APPROXIMATE SPEED AT FULL LOAD.					
1½	900					
2	1200	850				
3 & 5	1800	1125	850			
7½	1700	1150	975	850	650	
10	1700	1300	1150	850	730	600
15	1700	1250	1100	825	675	600
20	1700	1100	900	750	650	
25	1400	1100	950	825	600	
30	1700	1150	975	725	600	
35	1700	1150	850	675		
40	1700	950	775	600		
50	1700	975	750	565		
60	1700	875	680			
65	575					
75	1700	1100	850	635	475	
85	540					
100	1700	1100	850	625		
120	720					
125	600					
150	1100	550				
200	850	500				
250	425					

550 VOLTS.

H. P.	APPROXIMATE SPEED AT FULL LOAD.					
2	1350	900				
3	1800	1200				
3½	900					
5	1800	1200	850			
7½	1750	1150	975	850	700	
10	1700	1300	1150	850	730	600
15	1700	1250	1100	825	675	600
20	1700	1100	900	750	650	
25	1400	1100	950	825	600	
30	1700	1150	975	725	600	
35	1700	1150	850	675		
40	1700	950	775	600		
50	1700	975	750	565		
60	1700	875	680			
75	1700	1100	850	635	475	
85	540					
100	1100	850				
120	720					
125	600					
150	1100	550				
200	500					
250	425					

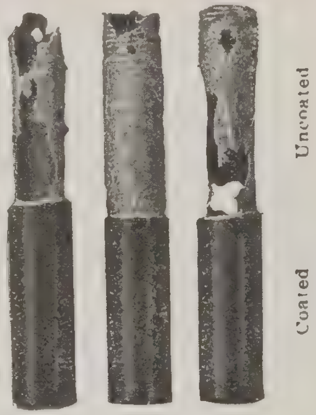
THE HIGHLAND CHEMICAL PRODUCTS CO.

CONNELLSVILLE, PA.

Highland Non-Corrosive Coating.

Products

That trade-mark stands for something more than mere paint. It **guarantees** actual protection from corrosion, or we forfeit payment for it. Highland Non-Corrosive Coating (Nos. 1 and 2) holds corrosion in check on structural steel, roofs, sidings, air and water pipe, tanks, pumps, steel ties, steel mine timbers cars, trolley poles, conduits, fans, cages, and water hoists. It also prevents the disintegration of concrete. In brief, wherever corrosion flourishes it will curtail its damage. You may order it with the understanding that if you are not satisfied with results, you need not pay for the goods.



Trade-Mark Registered
United States Patent-Office

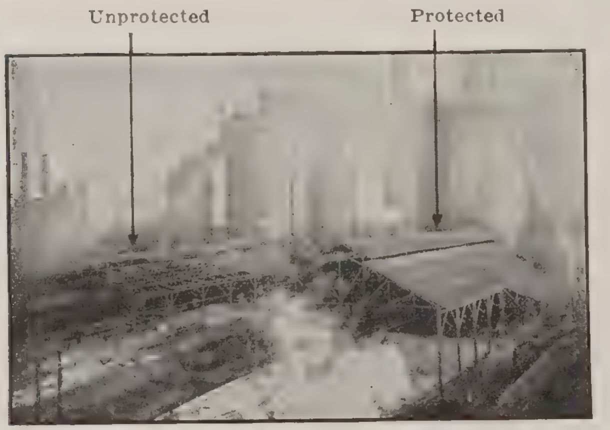
Protective Paints

Highland Non-Corrosive Coating is of three grades.

Highland Non-Corrosive Coating No. 1.—Is for general structural iron painting, for lasting and entirely satisfactory results. It is guaranteed to prevent rapid corrosion on tipples, fan houses, etc., caused by coke smoke.

Highland Non-Corrosive Coating No. 2.—Is for pipe lines and other underground work where the surface coated does not come in contact with daylight.

Highland Structural Coating.—Is for general structural iron pointing, but is not guaranteed to give the lasting results obtained from No. 1. It is for buildings, roofs, stacks, etc., where the use of the highest grade paint is not justified.



The corroded roof was painted with ordinary paint. The other was coated five years previous with Highland Coating. The whole story of waste and economy is told by this actual example.

Highland Paint

This paint is made to meet the demands for a low price paint and to protect our customers against inferior and injurious goods placed on the market as "secret process" or "newly discovered gums" with claims and guarantees that are impossible. Highland Paint is made from substantial materials, carefully selected, and will give satisfactory results. We can safely say it is the best that can be produced for the money.

A Copy of "The Sulphurette" Is Yours—

Send for It

"The Sulphurette—and It's Finish" is the title of a booklet that every mining man should have. It's full of boiled-down meaty, interesting **facts.**

It shows how corrosion causes losses, why it does and how to prevent it.

There's a copy here for you. Will you send a request for it today? If you have a special corrosion problem that's bothering you, ask us for the solution out of our wide experience in handling all manner of similar problems. The service costs you nothing.

A. M. BYERS COMPANY

ESTABLISHED 1864

PITTSBURGH, PA.

23 Sullivan St., New York City 11 Sleeper St., Boston, Mass. 720 Fulton St., Chicago, Ill.

BYERS GENUINE WROUGHT IRON PIPE

FULL WEIGHT GUARANTEED

Black and Galvanized. Sizes from 1-8 Inch Up to 12 Inch.
Standard, Extra Heavy and Double Extra Heavy

Guarantee

All Byers Pipe is guaranteed to be made from high grade pig iron, especially suitable for the purpose, refined by hand puddling, rolled into muck bar, cut, piled and rerolled into skelp without the addition of scrap of any kind.

Every individual length is guaranteed to be full weight, within a variation of not more than 2½ per cent below or 5 percent above standard weight.

Inspection and Testing

The most rigid and thorough system of testing and inspecting is enforced from the ore to the finished product. Briefly, this includes: analysis of ore; analysis of coke and limestone used in the blast furnace; analysis of pig iron; individual test of the output of each puddling furnace daily; inspection of every length of pipe immediately after cooling; hydrostatic test after threading pipe; inspection before shipment.

All Byers Pipe is made up to the same high standard. No Byers Pipe that does not pass all the tests is ever put on the market. It is therefore as perfect as it is commercially possible to make it.

Resistance to Corrosion

Iron when taken out of the puddling furnace consists of a spongy mass of plastic iron globules thinly coated with slag or cinder. During the rolling process the globules become elongated and the slag takes the form of fine bands lying between the long iron fibres. This slag is composed of non-corrosive silicates.

It is due to the presence of more than one hundred thousand of these slag bands in every inch of metal that Byers pipe shows such great resistance to corrosion. When corrosive agencies begin to act, more and more of the slag becomes exposed, protecting the underlying metal and considerably minimizing the effect of pitting. There is no protective slag present in steel and consequently, when corrosion starts there is nothing to retard its progress and the result is a deep pit which, in a comparatively short time, tends to penetrate completely through the wall of the pipe.

Fabrication

Due to its softness, as well as its fibrous structure, Byers Pipe is easily bent, cut and threaded. The fabricating cost is very small, and the joints uniformly tight. For this reason alone, it pays to use Byers in preference to cheaper grades of pipe.

Ultimate Cost

The life of Byers Pipe is estimated to be from two to ten times that of steel. The repair cost is very small, due to clean threads, tight joints, uniformly good welds and the great toughness of the pipe. The slightly higher first cost of Byers is therefore actually the best kind of economy.

Galvanized Pipe

The galvanizing coating on Byers Pipe is 40 per cent heavier than the coating on the best galvanized steel pipe. Nothing but the highest grade Prime Western Spelter, applied by the hot process in the model new Byers galvanizing plant, is used.

Due to the characteristic rough surface of genuine wrought iron, the spelter sinks in deeply and obtains such a firm hold on the metal that it will not scale off or be easily abraded in shipping, handling or fabricating.

Marking

Rule—Several feet apart on every length of pipe the Byers NAME AND YEAR OF MANUFACTURE are rolled in raised letters.

Exceptions—Small sizes, including ⅛″ Standard and Extra Heavy and ¼″ Extra Heavy, do not have the Byers name and year rolled in the metal, but are bundled and identified by a tin tag having the BYERS name embossed across the top.

Caution—Byers Pipe of 1¼″ and 1½″ size is furnished either lapwelded or buttwelded, and is stenciled accordingly. As buttweld pipe costs less than lapweld, and substitution is possible by washing off the stencil, 1¼″ and 1½″ pipe have a "B" or an "L" rolled into the metal, as follows:

BYERS '16—B to indicate Butt Weld. (1¼″ and 1½″ only.)

BYERS '16—L to indicate Lap Weld. (1¼″ and 1½″ only.

Write for the name of the Byers Dealer in your District. He can supply you immediately.

CAST IRON PIPE MAKERS

The following makers of Cast Iron Pipe are Independent of of each other and competitors; inquiries may be sent to any or all of these with assurance of prompt and full response:

American Cast Iron Pipe Co.
Birmingham, Ala.

James B. Clow & Sons
Chicago, Ill.

Donaldson Iron Co.
Emaus, Lehigh Co., Pa.

Glamorgan Pipe & Foundry Co.
Lynchburg, Va.

Lynchburg Foundry Co.
Lynchburg, Va.

Massillon Iron & Steel Co.
Massillon, Ohio

Standard Cast Iron Pipe & Fdry. Co.
Bristol, Pa.

U. S. Cast Iron Pipe & Fdry. Co.
Philadelphia, Pa.

Products

Cast Iron Bell and Spigot and Flanged Pipe and Fittings for Water and Gas; Flexible Joints for Submerged Lines; High Pressure Pipe and Specials for Fire Service; Plain End and Threaded Cast Iron Pipe; Cast Iron Culverts, Drains, Sewers, etc. Large and Small Special Castings.

Description

Cast Iron Pipe has for more than 250 years been the standard conduit for water and gas distribution underground, for which purpose it is better adapted than any other metal pipe.

Because of its crystalline structure, Cast Iron is proof against the destructive effects of corrosion evidenced by the scaling off of the laminated particles of the more highly refined and manipulated metals.

The life of Cast Iron Pipe has never been determined, and it is generally agreed that under normal conditions of soil and climate it will last forever.

Specifications

Following are the most important sections of the specifications of the American Water Works Association, which have been adopted by the above Makers as their manufacturing standard for water pipe:

STANDARD SPECIFICATIONS FOR CAST-IRON WATER PIPE AND SPECIAL CASTINGS, ADOPTED MAY 12, 1908.

Description of Pipe

Section 1—The pipe shall be made with hub and spigot joints and shall accurately conform to the dimensions given in Tables Nos. 1 and 2. They shall be straight and shall be true circles in section, with their inner and outer surfaces concentric, and shall be of the specified dimensions in outside diameter. They shall be at least 12 feet in length, exclusive of socket.

Allowable Variation in Diameter of Pipe and Sockets

Section 2—Especial care shall be taken to have the sockets of the required size. The sockets and spigots will be tested by circular guages, and no pipe will be received which is defective in joint-room from any cause. The diameters of the sockets and the outside diameters of the spigot ends of the pipe shall not vary from the standard dimensions by more than .06 of an inch for pipe 16 inches or less in diameter; .08 of an inch for 18-inch, 20-inch and 24-inch pipe; .10 of an inch for 30-inch, 36-inch and 42-inch pipe; .12 of an inch for 48-inch, and .15 of an inch for 54-inch and 60-inch pipe.

Allowable Variation in Thickness

Section 3—For pipe whose standard thickness is less than 1 inch, the thickness of metal in the body of the pipe shall not be more than .08 of an inch less than the standard thickness, and for pipe whose standard thickness is 1 inch or more, the variation shall not exceed .10 of an inch, except that for spaces not exceeding 8 inches in length in any direction, variations from the standard thickness of .02 of an inch in excess of the allowance above given shall be permitted. For special castings of standard patterns a variation of 50 per cent. greater than allowed for straight pipe shall be permitted.

Defective Spigots May Be Cut .

Section 4—Defective spigot ends on pipe 12 inches or more in diameter may be cut off in a lathe and a half round wrought-iron band shrunk into a groove cut in the end of the pipe. Not more than 12 per cent of the total number of accepted pipe of each size shall be cut and banded, and no pipe shall be banded which is less than 11 feet in length, exclusive of the socket.

Allowable Percentage of Variation in Weight

Section 7—No pipe shall be accepted the weight of which shall be less than the standard weight by more than 5 per cent for pipe 16 inches or less in diameter, and 4 per cent for pipe more than 16 inches in diameter, and no excess above the standard weight of more than the given percentage for the several sizes shall be paid for. The total weight to be paid for shall not exceed for each size and class of pipe received the sum of the standard weights of the same number of pieces of the given size and class by more than 2 per cent.

No special casting shall be accepted the weight of which shall be less than the standard weight by more than 10 per cent. for pipe 12 inches or less in diameter, and 8 per cent. for larger sizes, except that curves, Y-pieces and breeches pipe may be 12 per cent. below the standard weight, and no excess above the standard weight of more than the above percentages for the several sizes will be paid for. These variations apply only to castings made from the standard patterns.

Quality of Iron

Section 8—All pipe and special castings shall be made of cast iron of good quality, and of such character as shall make the metal of the castings strong, tough and of even grain, and soft enough to satisfactorily admit of drilling and cutting. The metal shall be made without any admixture of cinder iron or other inferior metal, and shall be remelted in a cupalo or air furnace.

The contractor shall have the right to make and break three bars from each heat or run of metal, and the test shall be based upon the average results of the three bars. Should the dimensions of the three bars differ from those given below, a proper allowance therefor shall be made in the results of the tests.

Tests of Material

Section 9—Specimen bars of the metal used, each being twenty-six inches long by two inches wide and one inch thick, shall be made without charge as often as the engineer may direct, and in default of definite instructions, the contractor shall make the test at least one bar from each heat or run of metal. The bars when placed flatwise upon supports twenty-four inches apart, and loaded in the center, shall support a load of 2,000 pounds, and show a deflection of not less than .30 of an inch before breaking; or if preferred, tensile bars shall be made which will show a breaking point of not less than 20,000 pounds per square inch.

Casting of Pipe

Section 10—The straight pipe shall be cast in dry sand molds in a vertical position. Pipe 16 inches or less in diameter shall be cast with the hub end up or down, as specified in the proposals. Pipe 18 inches or more in diameter shall be cast with the hub end down.

The pipe shall not be stripped or taken from the pit while showing color of heat, but shall be left in the flasks for a sufficient length of time to prevent unequal contraction by subsequent exposure.

Quality of Castings

Section 11—The pipe and special castings shall be smooth, free from scales, lumps, blisters, sand holes and defects of every nature which unfit them for the use for which they are intended. No plugging or filling will be allowed.

Cleaning and Inspection

Section 12—All pipe and special castings shall be thoroughly cleaned and subjected to a careful hammer inspection. No casting shall be coated unless entirely clean and free from rust, and approved in these respects by the engineer immediately before being dipped.

Coating

Section 13—Every pipe and special casting shall be coated inside and out with coal-tar pitch varnish. The varnish shall be made from coal tar. To this material sufficient oil shall be added to make a smooth coating, tough and tenacious when cold, and not brittle nor with any tendency to scale off.

Hydrostatic Test

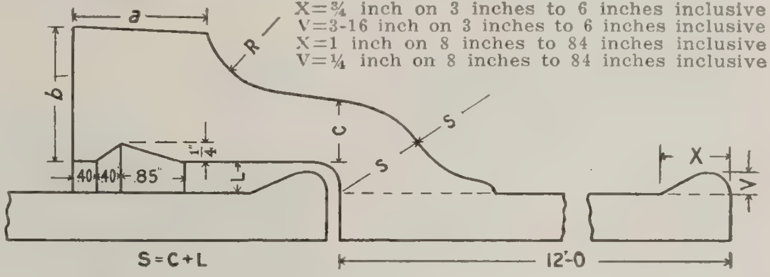
Section 14—When the coating has become hard, the straight pipe shall be subjected to a proof by hydrostatic pressure, and, if required by the engineer, they shall also be subjected to a hammer test under this pressure.

The pressure to which the different sizes and classes of pipe shall be subjected are as follows:

	20-Inch Diameter and Larger, Pounds per Square Inch.	Less than 20-Inch Diameter, Pounds per Square Inch.
Class A Pipe.	150	300
Class B Pipe.	200	300
Class C Pipe.	250	300
Class D Pipe.	300	300

Castings to Be Delivered Sound and Perfect

Section 19—All the pipe and other castings must be delivered in all respects sound and conformable to these specifications. The inspection shall not relieve the contractor of any of his obligations in this respect, and any defective pipe or other castings which may have passed the engineer at the works or elsewhere shall be at all times liable to rejection when discovered, until the final completion and adjustment of the contract; provided, however, that the contractor shall not be held liable for pipe or special castings found to be cracked after they have been accepted at the agreed point of delivery. Care shall be taken in handling the pipe not to injure the coating, and no pipe or other material of any kind shall be placed in the pipe during transportation or at any time after they have received the coating.



X=¾ inch on 3 inches to 6 inches inclusive
V=3-16 inch on 3 inches to 6 inches inclusive
X=1 inch on 8 inches to 84 inches inclusive
V=¼ inch on 8 inches to 84 inches inclusive

Nominal Diam., Inches	Classes	Actual Outside Diam., Inches	Diam. of Sockets		Depth of Sockets		A	B	C
			Pipe, Inches	Special Castings, Inches	Pipe, Inches	Special Castings, Inches			
4	A	4.80	5.60	5.70	3 50	4.00	1.5	1.30	.65
4	B–C–D	5.00	5.80	5.70	3.50	4.00	1.5	1.30	.65
6	A	6.90	7.70	7.80	3.50	4.00	1.5	1.40	.70
6	B–C–D	7.10	7.90	7.80	3.50	4.00	1.5	1.40	.70
8	A–B	9.05	9.85	10.00	4.00	4 00	1.5	1.50	.75
8	C–D	9.30	10.10	10.00	4.00	4.00	1.5	1.50	.75
10	A–B	11.10	11.90	12.10	4.00	4.00	1.5	1.50	.75
10	C–D	11.40	12.20	12.10	4.00	4.00	1.5	1.60	.80
12	A–B	13.20	14.00	14.20	4.00	4.00	1.5	1.60	.80
12	C–D	13.50	14.30	14.20	4.00	4.00	1.5	1.70	.85
14	A–B	15.30	16.10	16.10	4.00	4.00	1.5	1.70	.85
14	C–D	15.65	16.45	16.45	4.00	4,00	1.5	1.80	.90
16	A–B	17.40	18.40	18.40	4.00	4.00	1.75	1.80	.90
16	C–D	17.80	18.80	18.80	4.00	4.00	1.75	1.90	1.00
18	A–B	19.50	20.50	20.50	4.00	4.00	1.75	1.90	.95
18	C–D	19.92	20.92	20.92	4.00	4.00	1.75	2.10	1.05
20	A–B	21.60	22.60	22.60	4.00	4.00	1.75	2.00	1.00
20	C–D	22.06	23 06	23 06	4.00	4.00	1.75	2.30	1.15
24	A–B	25.80	26.80	26.80	4.00	4.00	2.00	2.10	1.05
24	C–D	26.32	27.32	27.32	4.00	4.00	2.00	2.50	1.25
30	A	31.74	32.74	32 74	4.50	4.50	2.00	2 30	1 15
30	B	32.00	33.00	33.00	4.50	4.50	2.00	2 30	1.15
30	C	32.40	33 40	33.40	4.50	4.50	2.00	2.60	1.32
30	D	32.74	33.74	33.74	4.50	4.50	2.00	3.00	1.50
36	A	37.96	38.96	38.96	4.50	4.50	2.00	2.50	1.25
36	B	38.30	39.30	39.30	4.50	4.50	2.00	2.80	1.40
36	C	38.70	39.70	39.70	4.50	4.50	2.00	3.10	1.60
36	D	39.16	40.16	40.16	4.50	4.50	2.00	3.40	1.80
42	A	44.20	45.20	45.20	5.00	5.00	2.00	2.80	1.40
42	B	44.50	45.50	45.50	5.00	5.00	2.00	3.00	1.50
42	C	45.10	46.10	46.10	5.00	5.00	2.00	3.40	1.75
42	D	45.58	46.58	46.58	5.00	5.00	2.00	3.80	1.95
48	A	50.50	51.50	51.50	5.00	5.00	2.00	3.00	1.50
48	B	50.80	51.80	51.80	5.00	5.00	2.00	3.30	1.65
48	C	51.40	52.40	52.40	5.00	5.00	2.00	3.80	1.95
48	D	51.98	52.98	52.98	5.00	5.00	2.00	4.20	2.20

STANDARD THICKNESS AND WEIGHTS OF CAST-IRON PIPE

Table No. 2 Classes A, B, C, D

Nominal Inside Diameter, Inches	Class A 100-Feet Head 43 Pounds Pressure			Class B 200-Feet Head 86 Pounds Pressure			Class C 300-Feet Head 130 Pounds Pressure			Class D 400-Feet Head 173 Pounds Pressure			Nominal Inside Diameter, Inches
	Thickness, Inches	Weight per Foot	Weight per Length	Thickness, Inches	Weight per Foot	Weight per Length	Thickness, Inches	Weight per Foot	Weight per Length	Thickness, Inches	Weight per Foot	Weight per Length	
4	.42	20.0	240	.45	21 7	260	.48	23.3	280	.52	25.0	300	4
6	.44	30 8	370	.48	33 3	400	.51	35 8	430	.55	38.3	460	6
8	.46	42.9	515	.51	47 5	570	.56	52.1	625	.60	55.8	670	8
10	.50	57.1	685	.57	63 8	765	.62	70.8	850	.68	76.7	920	10
12	.54	72.5	870	.62	82.1	985	.68	91.7	1100	.75	100.0	1200	12
14	.57	89.6	1075	.66	102.5	1230	.74	116.7	1400	.82	129.2	1550	14
16	.60	108.3	1300	.70	125.0	1500	.80	143.8	1725	.89	158.3	1900	16
18	.64	129.2	1550	.75	150.0	1800	.87	175.0	2100	.96	191.7	2300	18
20	.67	150.0	1800	.80	175.0	2100	92	208.3	2500	1.03	229.2	2750	20
24	.76	204.2	2450	.89	233 3	2800	1.04	279.2	3350	1.16	306.7	3680	24
30	.88	291.7	3500	1.03	333.3	4000	1.20	400.0	4800	1.37	450.0	5400	30
36	.99	391.7	4700	1.15	454.2	5450	1.36	545.8	6550	1.58	625.0	7500	36
42	1.10	512.5	6150	1 28	591.7	7100	1.54	716.7	8600	1.78	825.0	9900	42
48	1.26	666.7	8000	1.42	750.0	9000	1.71	908.3	10900	1.96	1050.0	12600	48

The above weights are per length to lay 12 feet, including standard sockets; proportionate allowance to be made for any variation.

THE MICHIGAN PIPE COMPANY

BAY CITY, MICHIGAN

Products

"Michigan" Wood Mine and Acid Pipe.

"Michigan" Hard Maple, Beech and Birch Pipe (for flushing clum).

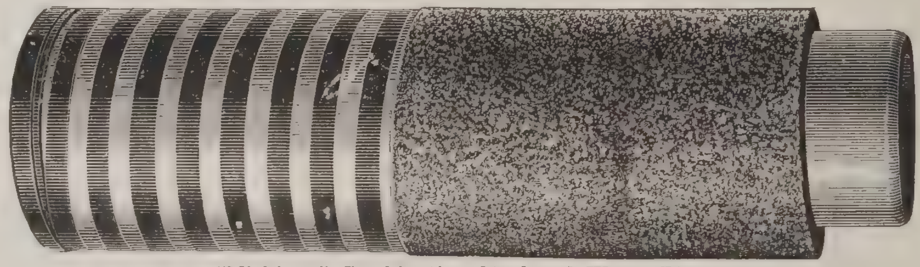
"Michigan" Tin-Lined Wood Casings for insulating underground or overhead heating pipes.

"Michigan Wood Mine and Acid Pipe is manufactured from selected Michigan White Pine and Tamarack Timber, thoroughly inspected and seasoned, spirally bound under heavy tension with galvanized steel wire or hoop iron, coated with imperishable asphaltum cement. This pipe is extensively used by coal mining operations and collieries throughout the United States, and will resist the action of sulphurous or acidulous liquids in the soil or conveyed through the pipe line.

"Michigan" Wood Mine Pipe is naturally acid-proof, it is light, strong, burst-proof, and inexpensive in first cost. "Michigan" Wood Pipe is the logical wood pipe for mine use, and for use wherever economy is an important factor of consideration, and where life-long satisfactory service is desired.

The advantages over metal pipes are many: Metal pipe is the natural victim of acids, it is high in first cost, liable to burst, and has other objectionable features. Before you give this matter of piping serious though, it is for your interest to investigate "Michigan" Pipe.

"Michigan" Hard Maple, Beech and Birch Pipe (For flushing culm), is manufactured in a similar manner to our water pipe from especially selected, seasoned hard maple, beech and birch timber, constructed with an extra thick shell and tenon. Used in the anthracite coal districts for conveying culm or fine coal dust and slate from the washeries.



"Michigan" Combination Steel and Water Pipe.

"Michigan" Hard Maple and Beech Pipe is unaffected by sulphur water and simply wears smooth by the friction of the flowing culm, where iron pipe in a short time is eaten and scratched through, rendering it useless. The life of this pipe is estimated ten times the life of metal pipe.

"Michigan" Tin-Lined Wood Casings for insulating underground or overhead steam, or hot water heating pipes. "Michigan" Casings are made of well seasoned pine and tamarack wood, with a shell or wall of 4—3 and 2 inches in thickness; of the solid log in the smaller sizes, and in the built up form (stave with tongue and groove) in the larger sizes, in lengths of 6 to 8 ft., strengthened with a No. 6 double galvanized steel wire. The interior of casing has a lining of bright tin, and the outer surface is covered with heavy waterproof asphaltum, and rolled when hot in sawdust. An average dead air space of 2 to 3½" is allowed between the wrought-iron pipe and the covering. The mortise and tenon points fit snuggly together and are simply driven together.

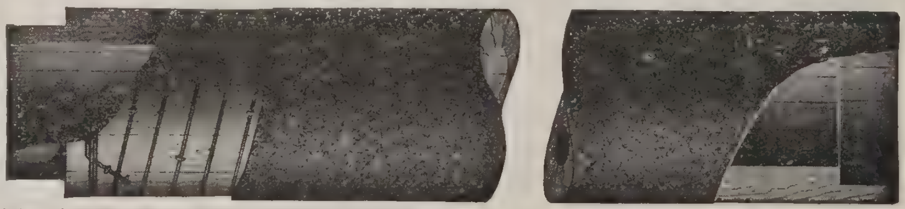
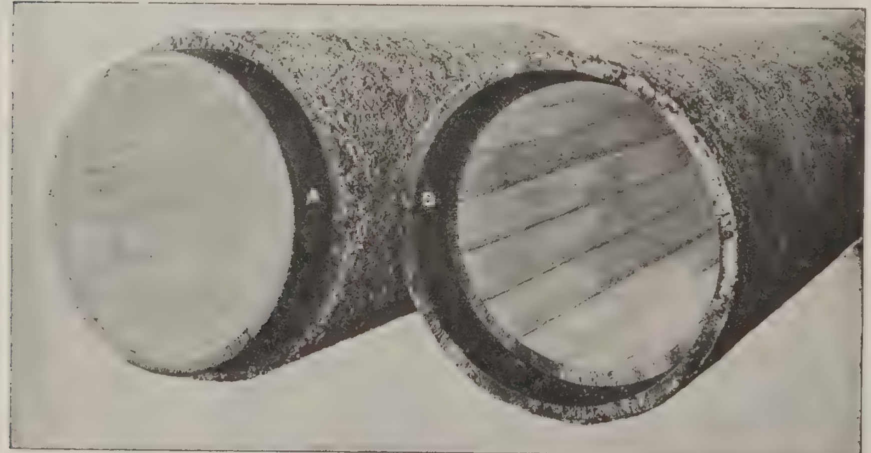


Fig. 2 "Michigan" Tin-Lined Wood Casings for Insulating Underground or Overhead Steam Pipes.



A—Tenon or Male Joint.
B—Mortise or Female Joint.

STANDARD WOOD PIPE COMPANY

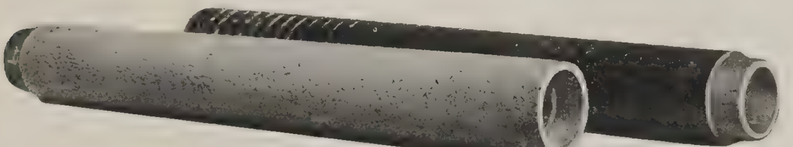
WILLIAMSPORT, PA.

Manufacturers of

Wood Water Pipe, and Steam Pipe Casing

Product

Manufacturers of wood water pipe for Coal Mines and Chemical Works to carry mine water, culm, fluids, acids, pulp and brine. For Water Works system, Power Plants. and Railroad Water Supply. Steam pipe covering for insulating underground steam pipes.

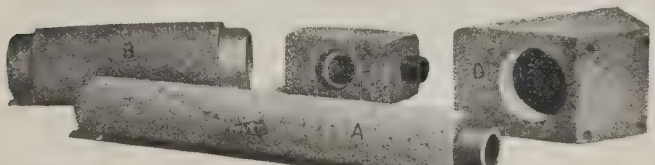


No. 18

The above cut illustrates two sections of pipe, on the left it is complete with coating, and on the right is the banding before it is coated. The pipe is made of white pine, douglas fir or cypress. Maple lumber we use for slushing culm. We wind with either hoops or galvanized wire, full consideration is given to the effects of the various compression, swelling and tensile strain.

We manufacture the pipe of staves and of solid bore. The staves are machined with a double tongue and grooved with faces plain. Staves are made of the thickness according to the sizes of pipe from lumber 1½", 2", 2½" and 3".

All our pipe is made under the supervision and approval of the most experienced and competent engineers, who readily recognizes its fitness, practical and economical value. The spacing of the bands or the double galvanized wire is according to the pressure required. The pipe receives a double coating of the best grade of hydrolene or asphaltum. The pipe is built from 1½" to 48" in diameter.

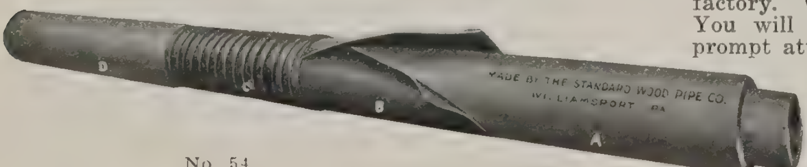


No. 21

The above illustrates wooden specials. We make connections of wood of any angle to withstand various pressures and various sizes to fit the wood pipe, especially for coal mines and chemical plants where iron fittings cannot be used. We also make cast iron connections of all designs.

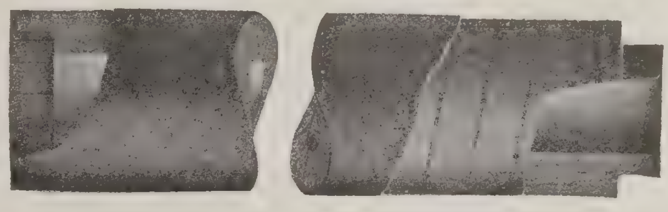
In the above illustration A shows a complete section of wood pipe. B shows a section of pipe with tenon on each end, used in some instances to connect fittings where the bell of the fitting faces the bell of the pipe. C shows a wooden tee, and D shows a 45° wood elbow.

The cut below illustrates our rubberized water pipe. See letter A body of wood pipe, B rubberized lining, C steel bands, and B asphaltum covering. The object of having a non-corrosive rubberized lining between the wood pipe and the steel bands is in order, to protect the bands from the acid water, which might seep through the wood, especially when the line is working under pump force or suction. For further information write for our folder No. 3, which illustrates in detail the merits of this wood pipe.



No. 54

Cut below gives a full view of the construction of our steam pipe casing. The lumber used by us for manufacturing our steam casing is selected live white pine thoroughly air dried before it is milled into staves. The length of the casing is made from 6' up to 12'. The thickness of the staves is made 2", 3" and 4", heavier if desired. Staves are assembled in a cylindrical form, with tongues and grooves extending the entire length. They are banded with **No. 6** galvanized wire from end to end under heavy tension sufficient to imbed the wire into the wood. Each section is provided with a tenon and chamber smoothly machines to fit, so they are easily driven together. The tenon and chamber are treated with a compound of creosote. The outside of the casing is thoroughly coated with a hot preservative, which is a thorough protection to the wood and wire, after which it is rolled in sawdust to facilitate handling. The tin lining consists of the best grade AAAA charcoal tin plate. The wire is held firmly by staples staggered every 9".



No. 44

For full particulars write for our booklet No. 2.

No. 57

The above view shows part of the interior work of our factory. We have the latest type of improved machinery. You will find our material of the highest grade, with prompt attention and satisfactory prices. Our best attention is given to inquiries for prices and for general information. We have the most practical man, who will be glad to assist you. Write for our general catalogue, which shows in detail how to connect our wood pipe to valves, pumps, etc.

NATIONAL TUBE COMPANY

GENERAL SALES OFFICES
Frick Building
PITTSBURGH, PA.

DISTRICT SALES OFFICES

ATLANTA, Candler Building
BOSTON, John Hancock Building
CHICAGO, 208 South La Salle Street
DENVER, Majestic Building
KANSAS CITY, R. A. Long Building
NEW ORLEANS, Maison Blanche
NEW YORK, Hudson Terminal Buildings
OMAHA, City National Bank Building
PHILADELPHIA, Widener Building
PITTSBURGH, Frick Building
ST. LOUIS, Third National Bank Building
ST. PAUL, Pioneer Building
SALT LAKE CITY, Walker Bank Building

PACIFIC COAST REPRESENTATIVES
U. S. STEEL PRODUCTS CO.

SAN FRANCISCO, Rialto Building
LOS ANGELES, Central Avenue and Jackson Street
PORTLAND, Selling Building
SEATTLE, Fourth Avenue, South (Cor. Connecticut)

EXPORT REPRESENTATIVES
U. S. STEEL PRODUCTS CO., NEW YORK, N. Y., Hudson Terminal Buildings

---

Products

NATIONAL TUBE COMPANY is the largest manufacturer of WROUGHT PIPE in the world and makes a full line of PIPE, TUBULAR and ALLIED PRODUCTS, designed for a variety of Mechanical, Manufacturing and Engineering Purposes. These include:

"NATIONAL" PIPE (butt-weld and lap-weld, sizes ⅛-inch to 30-inch, inclusive): Conductor, Refrigerating, Sewer, Gas, Water, Steam, Signal, Irrigation, Hydraulic, Mine, Natural Gas, Matheson Joint, Kimberly Joint, Converse Joint, Railing, Fence, Ladder, Round, Odd-Shaped Pipe and Oil Country Pipe and Casing.

Pneumatic and Speaking Tubes; Spellerized Steel Lap-Welded Boiler Tubes for Locomotive, Marine or Stationary Boilers; Tubular Steel Street Poles and Posts; Flag Poles and Fittings; Steel Pipes.

"SHELBY" Seamless Cold-Drawn Steel Mechanical Tubing for a variety of mechanical uses and for Beams, Columns, Struts, etc. "SHELBY" Seamless Hot-Finished Steel Tubing; "SHELBY" Seamless Cold-Drawn or Hot-Finished Steel Boiler Tubes for Stationary, Locomotive or Marine Boilers.

"SHELBY" Seamless Cold-Drawn Steel Trolley Poles; Cylinders of all types; Fence Posts; Steel Tanks; Tubes, Square and Round.

"KEWANEE" Specialties, which include "KEWANEE" Octagon, Hexagon, Round, Air Pump, M. & F., Hose, Air Drill, Eccentric, Extra Heavy, Hydraulic, and Flange Unions; "KEWANEE" Valves and Cocks; "KEWANEE" Boiler Couplings; "N. T. C." Regrinding Valves; Well Points and Well Supplies.

Also, a complete line of "N. T. C." Malleable and Cast-Iron Fittings; Brass Fittings; Brass Cocks and Valves; "NATIONAL" Flange Unions; Gas, Water and Steam Fittings; Radiators, Wrought and Staggered Tube; Radiator Valves; Nipples; Foot Valves; Boiler Couplings; Pipe Bends; Pipe Saddles, and Clamps; Acid Cocks, Fittings and Valves; Brass and Malleable Unions; Brass and Iron-Body Gate, Globe, Angle and Check Valves.

Expansion Joints; Floor Plates; Gas Fittings; Hangers; Conductor Pipe Hangers; Pipe or Shaft Hangers; Conductor Pipe Hooks; Hose Couplings, Pipes and Valves; Post-Caps and Bases; Railing Fixtures; Steam and Hot-Water Fittings and Specialties; Steam Traps; Wall Plates; Water Columns.

1.—Evolution and trend of opinion regarding the Increasing use of Wrought Steel Pipe and the relative merits of Wrought Steel and Iron Pipe.

Q. What is the general trend of engineering opinion regarding the relative merits and use of wrought steel and wrought iron pipe in mining, engineering and allied fields?

A. That the general trend of engineering opinion is favorable to wrought steel pipe is positively indicated by the statements contained in articles written by engineers, coal field operators, practical men and others for the trade and technical press; favor is also shown by the standard specifications adopted by leading engineering societies and similar organizations. The following quotations certainly are indicative of the general trend, showing that **steel** is the selection which is made.

(a)—The Power Piping Society of Pittsburgh, Pa., consisting of power plant engineers and erectors, formed and adopted standard specifications for power plant piping and fittings. The specification is definite and reads:

> "Wrought Pipe shall be steel."

These specifications are published in full on pages 176, 177 and 178.

In view of the increasingly high steam pressures and the superheated steam now being used, all steam service conditions have become so severe that it is very significant that steel pipe has been adopted for such standard specifications.

(b)—The standard specifications adopted in 1915 by the American Society for Testing Materials for "Welded Steel and Wrought Iron Pipe" is a practical admission by all concerned that wrought iron pipe is not equal to wrought steel pipe in general physical properties. Is this not significant when one considers that the membership of this organization includes both users and manufacturers of wrought steel and wrought iron pipe?

(c)—The City of St. Louis, Mo., definitely specified steel pipe for all steam piping in the engine and boiler rooms of the Low Service Pumping Station, Chain of Rocks, St. Louis Water Works. The specifications read:

> "All pipe over 4-inches diameter, including all bends, unless shown otherwise, shall be full weight lap-welded steel. All pipe 4-inches diameter and under shall be of full weight Spellerized Steel. Offset bends shall be of extra strong lap-welded steel pipe."

(d)—"Viewing impartially all of the data presented so far there seems to be little to choose between wrought iron and steel pipe, on the whole, as regards their resistance to corrosive influences, but one point may be mentioned with reference to the manner in which these materials corrode: With steel the rusting takes place more or less uniformly over the surface, while wrought iron shows a decided inclination to form deep pits. That this is a dangerous tendency can hardly be doubted."—L. C. Wilson, "Wrought Iron or Steel Pipes." Engineering Magazine, November, 1915, pages 253-254.

(e) One of the leading newspapers in the iron and steel district in a review of Mr. Wilson's article remarks:

> "To paraphrase an old saying, a pipe wall is no stronger than its thinnest spot, therefore to the extent in which wrought iron exhibits this defect in greater measure than steel, it may be considered correspondingly inferior."—Pittsburgh Gazette-Times, November 7, 1915.

Q. When was wrought steel pipe first introduced?

A. The first wrought steel pipe was made and marketed about 1888.

Q. What was the tonnage of wrought steel pipe for the years 1888, 1905, and 1913?

A. The approximate tonnage of wrought steel pipe in 1888 was about 500 tons. By 1905 this small tonnage had grown to 983,198 tons and in the short period of twenty-five years—or by 1913—the annual production of steel pipe had increased to 2,189,218 tons.

Q. How do these figures compare with the production of wrought iron pipe?

A. The approximate tonnage of wrought iron pipe in 1888 was 500,000 tons; in 1905, 452,797 tons and in 1913 this tonnage had further decreased to 312,746 tons—or 187,254 tons less in 1913 than in 1888.

Q. Are there statistics available showing the production of wrought steel and iron pipe for the intervening years between 1888 and 1913?

A. Yes the following figures compiled by the American Iron and Steel Institute and published in Special Statistical Bulletin No. 8, show the relative production of wrought steel and iron pipe. No separate figures were compiled prior to 1905 showing the relative production of wrought steel or iron pipe.

PRODUCTION OF IRON AND STEEL SKELP IN UNITED STATES FROM 1905-1914—GROSS TONS

Year	Iron	Steel	Total	Per Cent Iron	Per Cent Steel
1905.... .	452,797	983,198	1,435,995	31.5	68.5
1906.... .	391,517	1,137,068	1,528,585	25.7	74.3
1907....... .	444,536	1,358,091	1,802,627	24.6	75.4
1908.........	297,049	853,534	1,150,583	25.8	74.2
1909.........	370,151	1,663,230	2,033,381	18.2	81.8
1910.... ...	350,578	1,477,616	1,828,194	19.2	80.8
1911....	322,397	1,658,276	1,980,673	16.3	83.7
1912... ...	327,012	2,119,804	2,446,816	13.3	86.7
1913...	312,746	2,189,218	2,501,964	12.5	87.5
1914.........	264,340	1,718,091	1,982,431	13.3	86.7
1915	**262,198**	**2,037,266**	**2,299,464**	**11.4**	**88.6**

The graphic chart below shows the relative production in diagrammatic form.

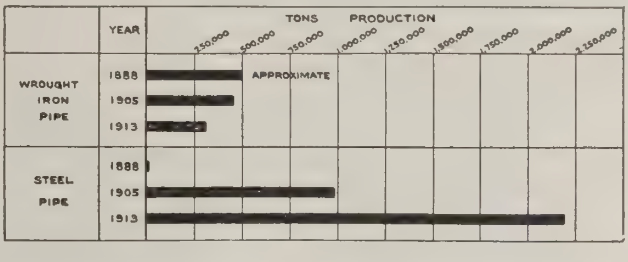


DIAGRAM SHOWING PRODUCTION OF WROUGHT IRON AND STEEL PIPE FROM 1888 TO 1913.

Q. What is the reason for this enormous increase in the manufacture and use of wrought steel pipe?

A. Principally the production and development of a soft, weldable, low carbon steel, possessing such uniform physical and chemical properties that, owing to improved special manufacturing processes, steel pipe has proved not only the equal but the superior in service and durability of the earlier product—wrought iron.

Q. When was the first steel pipe manufactured by National Tube Company?

A. National Works of National Tube Company, located at McKeesport, Pa., manufactured steel pipe in the early nineties, but the first steel pipe made in America was produced by the Riverside Iron Works, Wheeling, W. Va., about 1887. This mill is now Riverside Works of National Tube Company.

Q. Has "NATIONAL" Pipe always been made from steel?

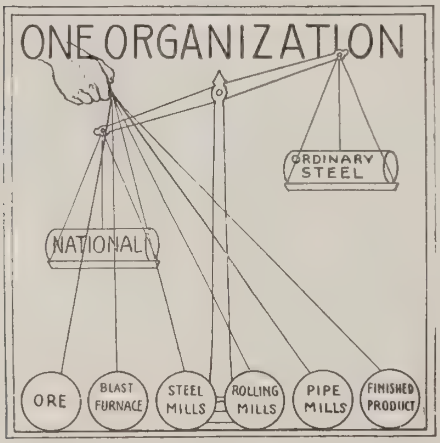
A. No. For many years National Tube Company was the largest manufacturer of wrought iron pipe in America, having used this material for pipe manufacture since 1868, the year in which their first plant was constructed in East Boston, Mass.

Q. When and why did National Tube Company discontinue the manufacture of wrought iron pipe?

A. After many years of investigation of actual service conditions, the evidence in favor of steel pipe was found so convincing that in

1909 National Tube Company abondoned entirely the manufacture of wrought iron pipe, making thereafter only one kind of wrought pipe (steel)—"NATIONAL" Pipe.

II—Manufacture of "NATIONAL" Pipe.



Q. Are all materials and processes used in the manufacture of "NATIONAL" Pipe controlled by one organization?

A. Yes; All raw products and processes involved in the production of "NATIONAL" Pipe are under the direct control of one organization.

Q. Of what advantage is this?

A. One controlling organization eliminates the probability of inferior material; it insures the maintenance of uniform chemical composition and physical properties; only by unified control is it possible to maintain the high unvarying standards of quality found in "NATIONAL" Pipe.

Q. How many plants does National Tube Company operate?

A. Eleven. National Works, Christy Park Works, and Versailles Works, at McKeesport, Pa.; The Continental, Pennsylvania and Republic Works, at Pittsburgh, Pa.; the Riverside Works, at Wheeling, W. Va.; the Lorain Works, at Lorain, O.; the Syracuse Works, at Syracuse, N. Y.; the Standard Works ("SHELBY") at Elwood City, Pa.; and the Kewanee Works, at Kewanee, Ill.

Q. Are these plants capable of supplying the demand for "NATIONAL" Pipe and allied tubular products?

A. No. The increasing demand for "NATIONAL" Pipe and allied tubular products has been so great within recent years that after a careful study of the market conditions National Tube Company decided recently to erect a new self-contained works at Gary, Ind.

Q. What will be the manufacturing capacity of this new plant?

A. Approximately 500,000 tons annually.

Q. What is the present annual manufacturing capacity of National Tube Company?

A. Upwards of 1,500,000 tons of "NATIONAL" and allied Tubular Products. When the Gary works are completed the total manufacturing capacity will be approximately 2,000,000 tons a year.

Q. Have there been any improvements in the processes used in manufacturing wrought pipe?

A. Yes. But practically all improvements have been confined to the production of wrought steel pipe. Probably the most important recent improvement in pipe manufacture has been the introduction and successful application of the Spellerizing Process, which is applied only to "NATIONAL" Pipe (sizes 4-inch and under).

Q. What is the advantage of this process?

A. The principal advantage of the Spellerizing Process is that the natural tendency to corrosion is reduced to a minimum.

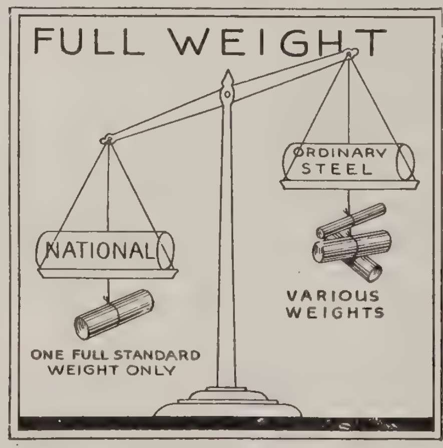
Q. What is the Spellerizing Process?

A. Spellerizing is a method of treating pipe skelp which consists in subjecting the heated bloom to the action of rolls having regularly shaped projections on their working surfaces; then, subjecting the bloom, while still hot, to the action of smooth faced rolls and repeating the operation, whereby the surface of the metal is worked so as to produce a uniformly dense texture better adapted to resist corrosion, especially in the form of pitting. This special process is under the exclusive control of National Tube Company. "NATIONAL" Pipe only is Spellerized. Pipe that is not "NATIONAL" is not Spellerized.

Q. Is the Spellerizing process applied to all sizes of "NATIONAL" Pipe?

A. No. Only the smaller sizes—4-inches and under. It is not necessary to Spellerize the larger sizes on account of the thicker walls which are not affected seriously by corrosion.

Q. Is "NATIONAL" Pipe made in "Merchant weights"?



A. No. "NATIONAL" Pipe since January 1, 1913, is made full standard weight only. There is no "merchant Weight" "NATIONAL" Pipe.

Q. What is the exact meaning of "full standard weight"?

A. Just this: "NATIONAL" Pipe does not appreciably vary in weight. For instance, mill records for a recent month show that out of twenty six sizes, nineteen averaged heavier than the published list of weights (see page 409), and, of the balance, none of the sizes weighed less than three per cent. above the minimum weights allowed, while a variation of five per cent. above or below the given weights is permissible.

Q. What is the average length of "NATIONAL" Pipe?

A. The average length of "NATIONAL" Pipe is approximately 20 feet; although, if desired, lengths up to and including 40-feet may be obtained.

Q. What is the range of sizes of "NATIONAL" Pipe?

A. "NATIONAL" Pipe is made in sizes ranging from ⅛-inch up to 30-inch, inclusive.

Q. Does National Tube Company manufacture a full and complete line of "NATIONAL" Tubular Products?

A. Yes, there is practically a "NATIONAL" Tube for every purpose.

Q. What are the standard weights and dimensions of "NATIONAL" Pipe?

A. The standard weights and dimensions of "NATIONAL" Wrought Pipe will be found on page 409.

Q. Is "NATIONAL" Pipe inspected and tested?

LOOK FOR THE MARK

¶ To readily identify "NATIONAL" material and as protection to manufacturer and consumer alike, the practice of National Tube Company is to roll in raised letters of good size on each few feet of every length of welded pipe the name "NATIONAL" (except on the smaller butt-weld sizes, on which this is not mechanically feasible: on these smaller butt-weld sizes the name "NATIONAL" appears on the metal tag attached to each bundle of pipe).

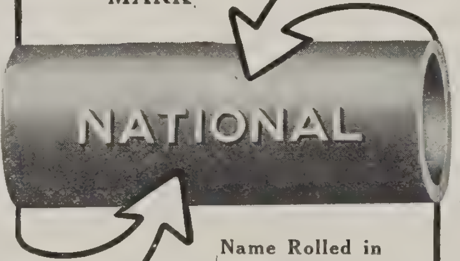
¶ When writing specifications or ordering tubular goods, always specify "NATIONAL" pipe, and identify as indicated.

¶ In addition, all sizes of "NATIONAL" welded pipe four in. and under are subjected to a roll-knobbling process known as Spellerizing to lessen the tendency to corrosion, especially in the form of pitting. This Spellerizing process is peculiar to "NATIONAL" pipe, to which process National Tube Company has exclusive rights.

¶ "NATIONAL" pipe was awarded the GRAND PRIZE (highest possible award) at Panama Pacific International Exposition, 1915.

AWARDED

AWARDED

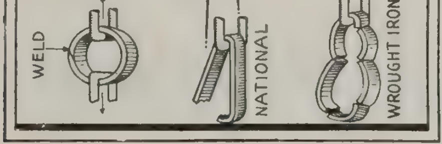


Name Rolled in Raised Letters on National Tube Company Pipe

A. Yes, "NATIONAL" Pipe is rigidly inspected at all important stages of manufacture for possible defects, and is thoroughly tested to insure the shipment of sound and serviceable tubular material. "NATIONAL" Pipe is subjected to an hydraulic pressure varying from 450 to 3000 pounds per square inch, according to the class of pipe and the character of service for which the pipe is designed.

Q. Is "NATIONAL" Pipe subjected to other tests besides the hydraulic tests?

A. "NATIONAL" Pipe will withstand very severe physical tests. For example, a ring cut from a piece of "NATIONAL" Pipe can be hammered flat until the inside surfaces meet in a straight line; when this test is applied to wrought iron pipe, the pipe walls fracture before the flattening is completed. The importance of this test is evidenced by this fact:



One of the largest railroad systems in this country recently added a clause to their pipe specifications relating to this flattening test, as follows:

> "It is not expected that wrought iron pipe will always stand this test without rupture, but the fracture should show good welding and material."

Q. Do the tests and inspections to which "NATIONAL" Pipe is subjected eliminate all defective material?

A. All inspections and tests of "NATIONAL" Pipe are so severe that the shipment of defective pipe is practically eliminated.

Q. What is done with defective pipe?

A. All defective "NATIONAL" Pipe is scrapped, therefore there are no "seconds" in shipments of "NATIONAL" Pipe.

Q. Is "NATIONAL" Pipe marked so that one can be sure that the pipe received on an order is "NATIONAL" Pipe?

A. All "NATIONAL" Pipe, sizes ¾-inches and over, is marked with the name "NATIONAL" rolled in raised letters every few feet on every length. All sizes below ¾-inch are bundled and on each bundle is a metal tag with the name "NATIONAL."

Q. What is the significance of rolling the name "NATIONAL" on "NATIONAL" Pipe?

A. It is the customer's guarantee of quality and assures the user that he receives pipe that "represents the highest development of the art."

III—Physical Properties of "NATIONAL" Pipe.

Q. What are the physical properties of "NATIONAL" Pipe?

A. The physical properties of "NATIONAL" Pipe will average approximately as follows:

Tensile strength	58,000 lbs. per sq. in.
Elastic limit	36,000 lbs. per sq. in.
Elongation in 8-inches	22 per cent.
Reduction in area	55 per cent.

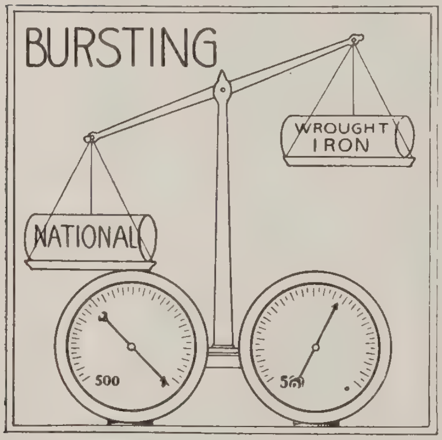
Q. How do these compare with wrought iron pipe?

A. The average physical properties of wrought iron pipe are as follows:

Tensile strength	46,000 lbs. per sq. in.
Elastic limit	28,000 lbs. per sq. in.
Elongation in 8-inches	12 per cent.
Reduction in area	25 per cent.

Q. What is the relative bursting strength of "NATIONAL" and wrought iron pipe?

A. Prof. R. T. Stewart, Dean of the College of Engineering of the University of Pittsburgh, read a paper before the American Society of Mechanical Engineers, which was published in their Proceedings, April, 1912, in which he gave the results of a number of bursting tests on wrought steel and iron pipe. The tests revealed that butt-weld wrought iron pipe was 70 per cent as strong as similar butt-weld steel pipe, and lap-weld wrought iron pipe was 57 per cent. as strong as lap-weld steel pipe.



Q. Will "NATIONAL" Pipe take a temper?

A. No. The carbon content is so low that "NATIONAL" Pipe will not take a temper when heated to redness and quenched in water, and will bend through 180 degrees before and after quenching.

IV—Chemical Properties of "NATIONAL" Pipe.

Q. What is the chemical composition of "NATIONAL" Pipe?

A. The average chemical analysis of the steel used in "NATIONAL" Pipe is as follows:

Carbon	.07 per cent.
Manganese	.30 per cent.
Sulphur	.045 per cent.
Phosphorus	.100 per cent.

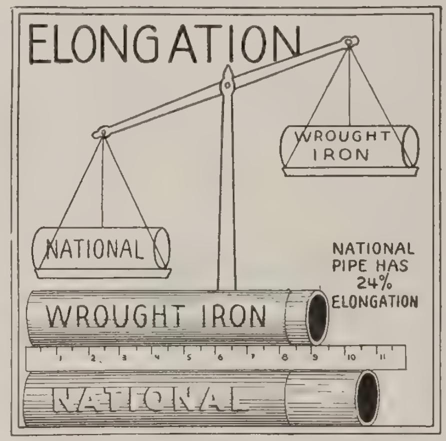
Q. Is there any important difference between the chemical analysis of "NATIONAL" and wrought iron pipe?

A. The average analysis of wrought iron pipe is as follows:

Carbon	Trace to .10 per cent.
Manganese	Trace to .15 per cent.
Sulphur	.030 per cent.
Phosphorus	.170 per cent.
Oxides and Silicates	1.20 to 2.00 per cent.

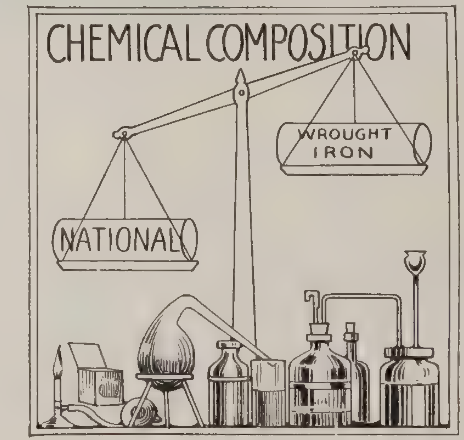
Q. What is the important difference between the analyses of wrought iron and "NATIONAL" Pipe?

A. It will be noted that the important difference between the two analyses lies in the content of slag and oxides; from these "NATIONAL" Pipe is practically free, while wrought iron contains from 1.20 to 2.00 per cent. "NATIONAL" Pipe is practically 99.5 per cent pure iron.



Q. What effect has this slag and oxide content upon the durability of wrought iron pipe?

A. These impurities, existing in the form of streaks or puddles in wrought iron, tend to accelerate corrosion rather than to retard it on account of the electrolytic difference between the pure iron and these impurities. "NATIONAL" Pipe, being practically free from such impurities, is better able to resist the destructive forces of corrosion.



Q. Is the chemical composition of "NATIONAL" Pipe always the same?

A. Yes. The manufacture of "NATIONAL" Pipe steel, being under the control of one organization from ore to the finished product, is uniform year in and year out. In fact, as proof of this statement, the carbon content of "NATIONAL" Pipe does not vary .01 per cent. in a year's work.

Q. Of what value is uniform chemical and physical composition?

A. Just this; it assures the consumer that "NATIONAL" Pipe is always the same in chemical composition and in physical structure and properties; and therefore, is always a dependable quality product.

V—Threading "NATIONAL" Pipe.

Q. Can "NATIONAL" Pipe be threaded as easily as wrought iron pipe?

A. Yes; letters were addressed recently to twenty-eight large manufacturers of pipe threading tools, asking:

> "Do your dies thread "NATIONAL" Pipe and wrought iron pipe equally well?"

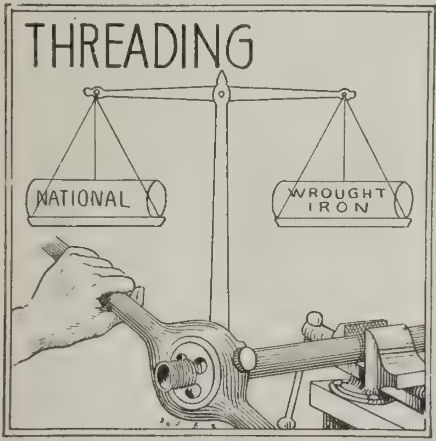
The replies were as follows:

Favor steel pipe	3
Favor wrought iron pipe	3
No difference	22

On the surface this would indicate a "tie," but the fact is that the three die manufacturers who favored wrought iron pipe are small concerns and not familiar with the advances made in the design of pipe threading tools during the past decade.

Q. How do threads cut on "NATIONAL" Pipe compare with those on wrought iron?

A. The threads cut on "NATIONAL" Pipe with properly designed dies are stronger and better, due to the fact that steel, being tough and homogeneous, does not crumble and scrape off as does wrought iron.



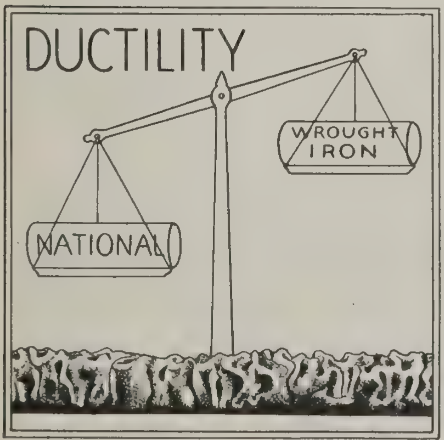
"NATIONAL" Pipe invariably yields cleaner-cut and stronger threads than wrought iron when sharp dies of proper design are used.

Q. Will "any kind" of dies thread "NATIONAL" Pipe?

A. Absolutely no. "Any kind" of dies will not thread "any kind" of pipe, although unfortunately many pipe users do not recognize this fact. Dies should be sharp, with a lip of proper angle; have clearance at the heel of the die, and a correct "lead." "NATIONAL" Bulletin No. 6 describes proper and improper threading dies and practices. Ask for a copy.

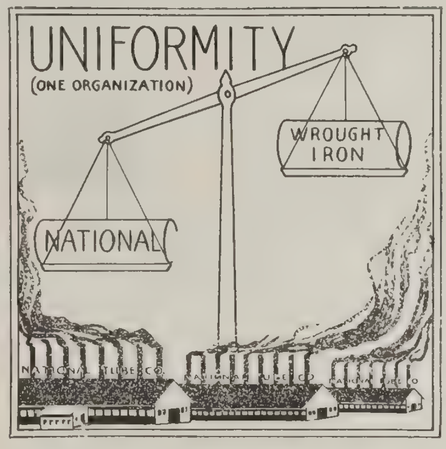
Q. Then special dies are required to thread "NATIONAL" Pipe?

A. Again—absolutely no. The worst set of dies can be reground, sharpened, and put in condition to cut either steel or wrought iron pipe easily and quickly. Dies are machines and must be kept in proper condition if good work is desired. "NATIONAL" Bulletin No. 6 is free for the asking. It tells how to sharpen old dies and keep them in first class working order.



VI—Durability of "NATIONAL" Pipe in Mine Service.

Q. Is "NATIONAL" Pipe durable in mining service?



A. Numerous service tests made by many independent coal and coke companies indicate that "NATIONAL" Pipe is equally as durable in mining service as the best grades of wrought iron.

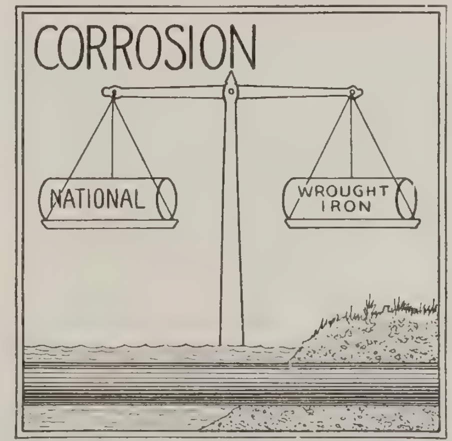
Q. What results have been obtained in these tests?

A. The average results obtained in these tests may be gleaned from the following:

> "Corrosion tests in running mine water were carried on by Prof. Thompson, The Pittsburgh Coal Company, H. C. Frick Coal Company and others, these indicating that steel is at least equal to wrought iron in resisting corrosion." (Iron Age, July 12,1906.)
>
> "The results indicate to us that steel is just as durable in the water in this mine as wrought iron."

Says one of the largest coal operators in Kentucky:

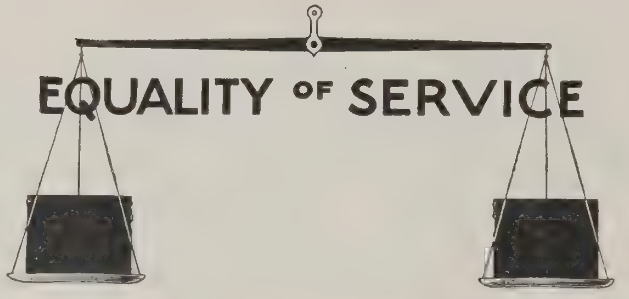
> "We thought the data decidedly in favor of steel, in view of the fact that we had anticipated a reversal of the leaning. . . . The results of this investigation would appear to indicate no practical difference in the life to be obtained from either iron or steel piping in the hot water service."



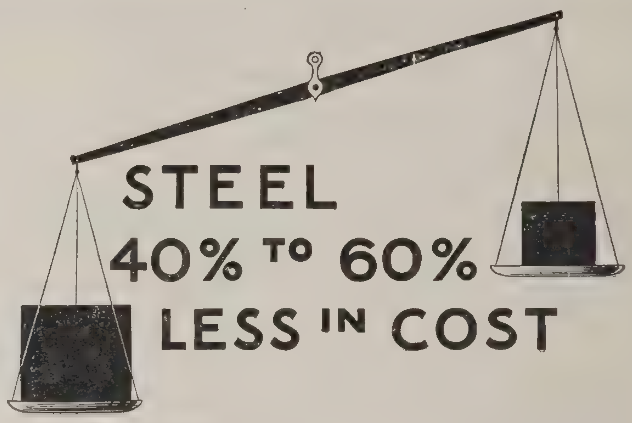
This from a coal operator in Pennsylvania. Comparisons of new steel and iron pipes in the boiler feed and other lines led this large company, which made the test, to the exclusive use of "NATIONAL" Pipe.

> "While corrosion was about the same, there was a pitting in the iron that we did not find in the steel, and the steel was corroded more uniformly. From the tests made, I know that the steel pipe is the better for such conditions."

This conclusion from an operator in the largest bituminous coal field in the world indicates the advantages gained by uniform material worked by the Spellerizing process in connection with "NATIONAL" Pipe.



"NATIONAL" Spellerized Pipe is not only the equal of the best puddled iron pipe, but has been found to be superior, in many instances under actual identical service conditions, to the ordinary grade of wrought iron pipe on the market.



Ordinary steel pipe is 40 to 60 per cent. less in cost than wrought iron: "NATIONAL" Spellerized Pipe gives better service at approximately same reduction in price. (See charts on page 453).

Probably the most recent test made to determine the relative durability of "NATIONAL" Pipe and wrought iron pipe in coal mine service was conducted in the anthracite coal district of northeastern Pennsylvania. Briefly summarized these tests were as follows:

Mine Water Test. A piece of extra strong wrought iron pipe and one of Standard "NATIONAL" Pipe were installed in the same line through which mine water was flowing. The wrought iron pipe failed in four days while the "NATIONAL" Pipe lasted eight days. The wrought iron pipe was pitted badly in many places, the depth of these pits varying from .055″ to .120″, while the "NATIONAL" Pipe was uniformly corroded, having lost about .025″ in thickness.

Test in Spit Vein of Mine. 3-inch wrought iron and "NATIONAL" Pipe were installed in the same location at different intervals; the rate of flow being the same. The wrought iron pipe lasted four days while the "NATIONAL" Pipe lasted from twenty-one to twenty-eight days. In this test the wrought iron was very badly pitted and completely corroded through at the threads, while the "NATIONAL" Pipe was pitted but slightly and showed a much more uniform corrosion. (See Fig. 4, page 454).

Test in Coal Washing Plant. All samples of wrought iron and "NATIONAL" Pipe were installed at the same time and were in service the same length of time, being removed after six weeks of service. The wrought iron pipe was badly pitted and corroded at the threads while the "NATIONAL" Pipe showed considerably less pitting and in some instances but very little. (See Fig. 7, page 455).

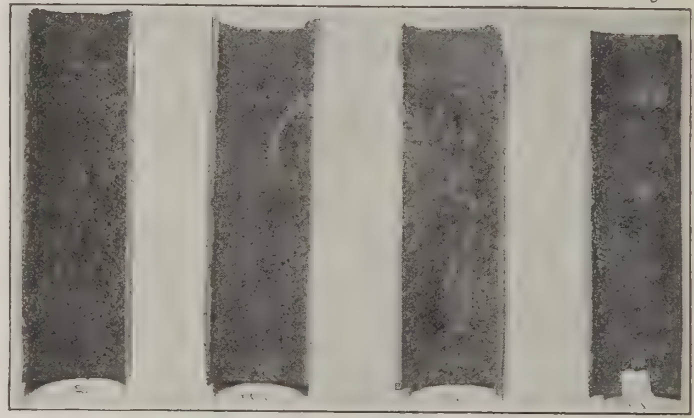


Fig. 1

Comparisons of adjacent wrought iron and steel pipes from hot water lines in Cresson coal fields. Investigation uncovered 4 comparisons where steel pitted less deeply that iron, 2 cases where the opposite was true, and 3 cases where the two materials corroded equally.

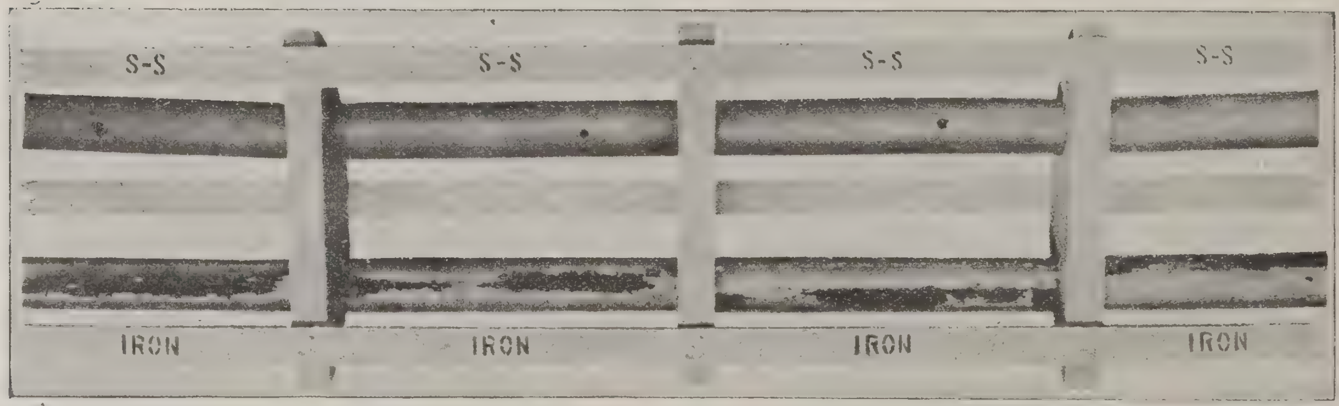
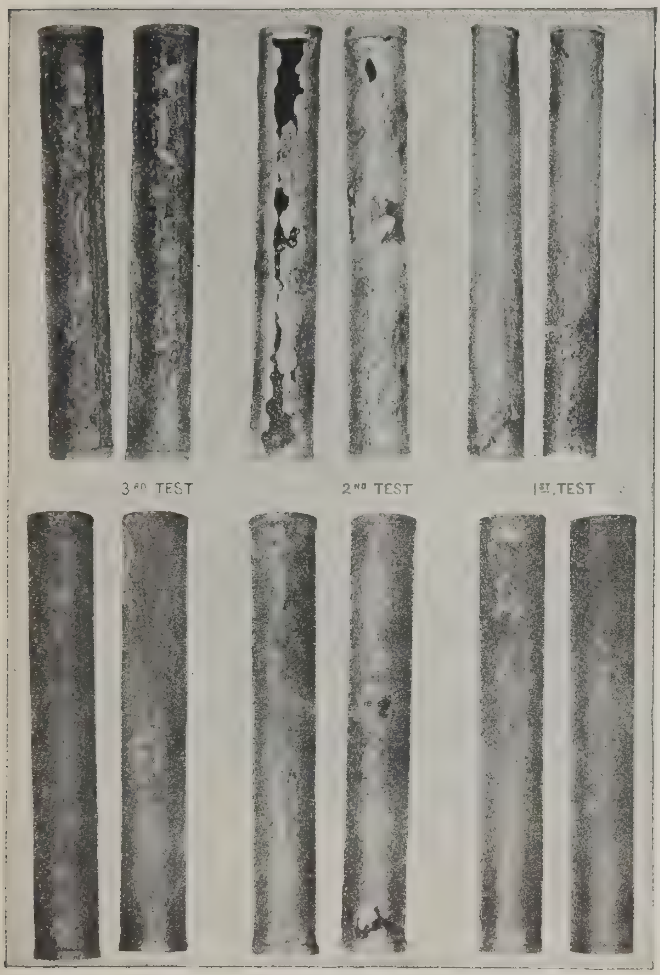


Fig. 2

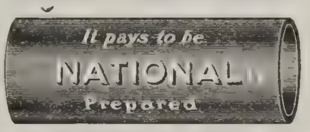
Pieces of Steel and Wrought Iron as Affected by Sulphur Water of Coal Mines. The Upper Pipes, marked S. S., are of "NATIONAL" Spellerized Steel.

Wrought Iron



"NATIONAL" Steel

Fig. 3
Samples of Steel and Wrought Iron Pipe as they appeared after continued submergence in the Waste Water from Coal Mines.



Comparative Costs Chart.

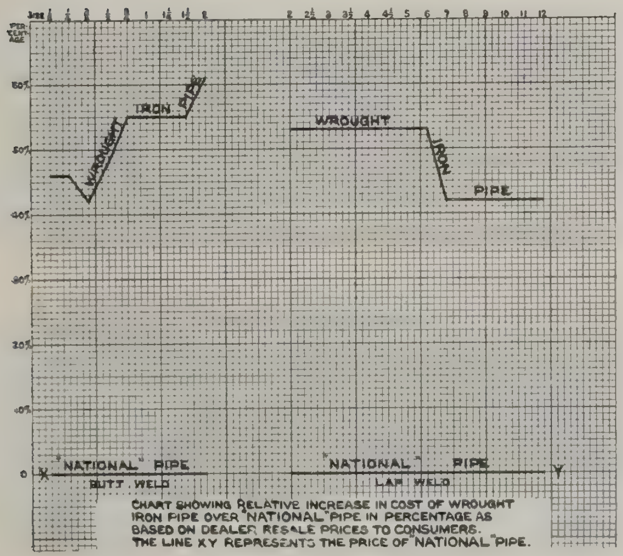


CHART SHOWING RELATIVE INCREASE IN COST OF WROUGHT IRON PIPE OVER "NATIONAL" PIPE IN PERCENTAGE AS BASED ON DEALER RESALE PRICES TO CONSUMERS.
THE LINE XY REPRESENTS THE PRICE OF "NATIONAL" PIPE.

VII—Cost and Service of "NATIONAL" Pipe.

Q. How does the cost of "NATIONAL" pipe compare with wrought iron pipe?

A. "NATIONAL" Pipe costs considerably less than wrought iron.

Q. What is the difference in cost?

A. The accompanying charts show comparative costs of "NATIONAL" and wrought iron pipe.

Q. Does not the lower cost of "NATIONAL" Pipe tend to lower the high standard of quality?

A. Not at all. When it is remembered that "NATIONAL" Pipe is made in large unit quantities, entirely by machinery under the supervision of a few specially trained men, and not in the small unit quantities of puddled wrought iron which depends for uniform quality on a man's individual strength and judgment, it will be apparent that the uniformity of "NATIONAL" Pipe must be far beyond the possibilities of wrought iron pipe.

Q. Is the value of "NATIONAL" Pipe recognized?

A. "NATIONAL" Pipe has been made entirely from steel during a few years only; during the year 1915, 88.6 per cent. of the total wrought pipe production was steel. (See table on page 447. That steel pipe—"NATIONAL" Pipe—is being specified and used by an ever increasing number of engineers, coal mine operators and others is shown by this large per centage of steel pipe to the total of all wrought pipe. Does this not seem ample evidence that "NATIONAL" Pipe leads the wrought pipe industry?

VIII—"NATIONAL" Pipe the Recognized Leader of All Wrought Pipe.

Q. Why is "NATIONAL" Pipe considered the leader of all wrought pipe?

A. Because, after fifty years, "NATIONAL" Pipe has been constantly improved both in material and manufacturing processes, until today the unvarying high standard of quality

Comparative Costs Chart.

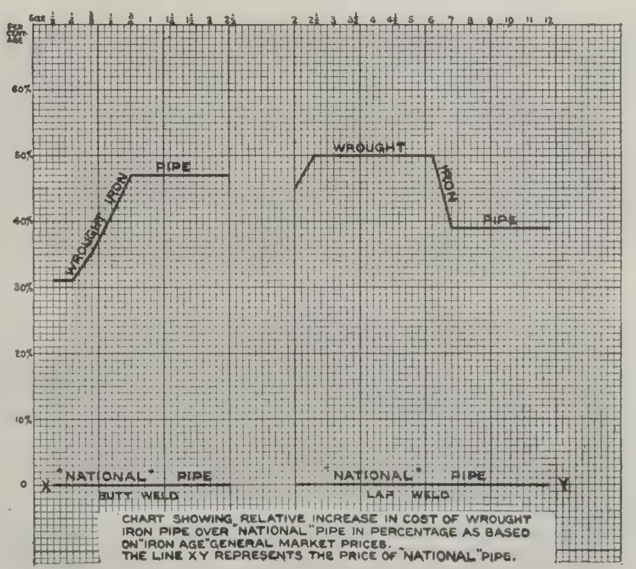


CHART SHOWING RELATIVE INCREASE IN COST OF WROUGHT IRON PIPE OVER "NATIONAL" PIPE IN PERCENTAGE AS BASED ON "IRON AGE" GENERAL MARKET PRICES.
THE LINE XY REPRESENTS THE PRICE OF "NATIONAL" PIPE.

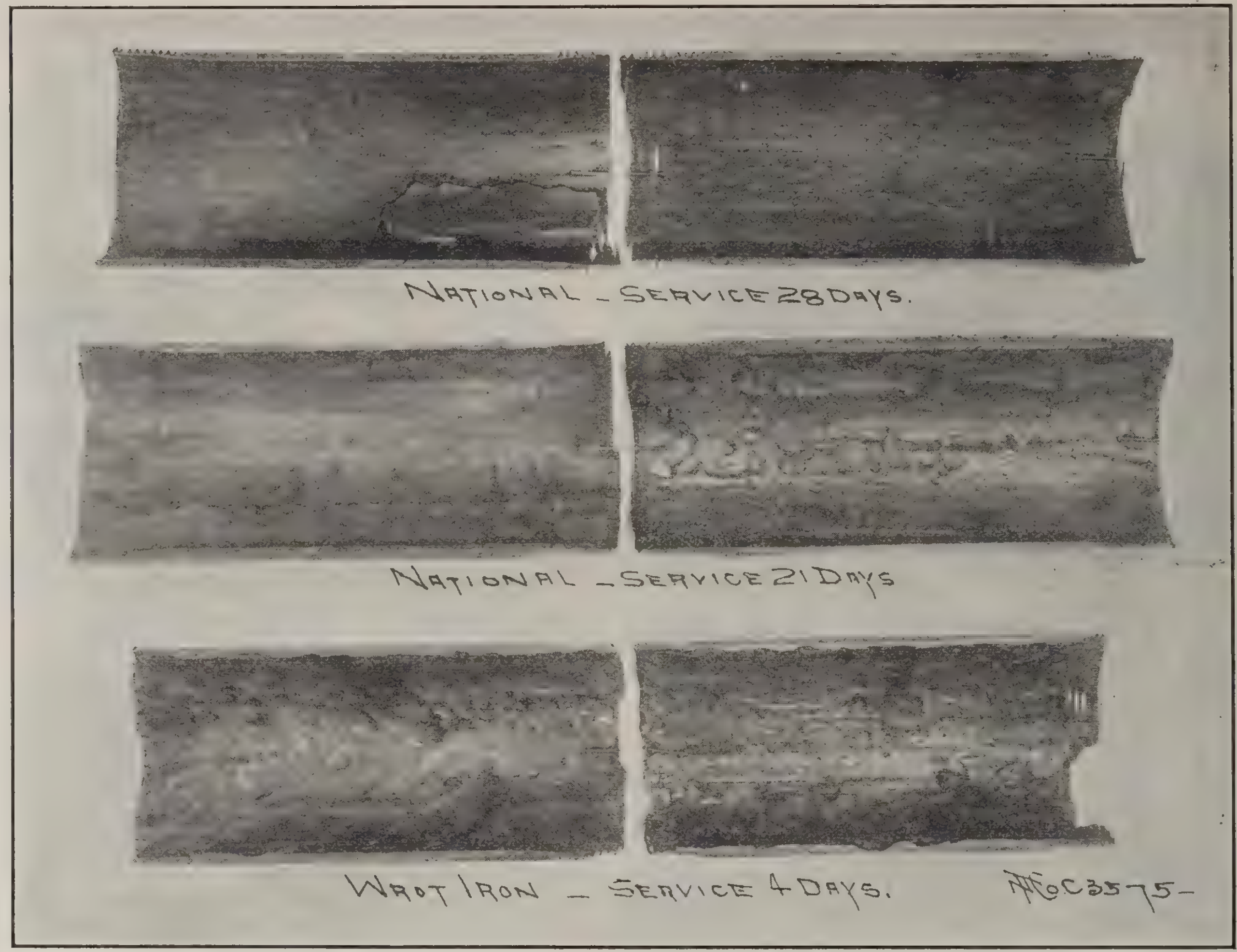

NATIONAL _ SERVICE 28 DAYS.
NATIONAL _ SERVICE 21 DAYS
WROT IRON _ SERVICE 4 DAYS.
RoC 3575-

Fig. 4
Samples of sections of "NATIONAL" and wrought iron pipe after being in coal mine service (anthracite coal fields of northeastern Pennsylvania) test under very severe conditions. The wrought iron pipe lasted four days while the "NATIONAL" Pipe was in service from twenty-one to twenty-eight days.

is beyond any other wrought tubular product. Services have been made a scientific study, the dangers from corrosion have been minimized by special manufacturing processes, and, in short, nothing has been left undone that will give the best possible pipe service to all classes of consumers. The supreme quality of "NATIONAL" Pipe was recognized by the Superior Jury of Awards at the Panama-Pacific International Exposition, 1915.

Q. Was "NATIONAL" Pipe awarded a prize at this exposition?

A. "NATIONAL" Tubular and Allied Products were awarded the **Grand Prize** by the Superior Jury of Awards at the Panama-Pacific International Exposition as "representing the highest development of the art."

Q. Was there more than one **Grand Prize**?

A. There was only one **Grand Prize** awarded to each class of material exhibited. The Medal

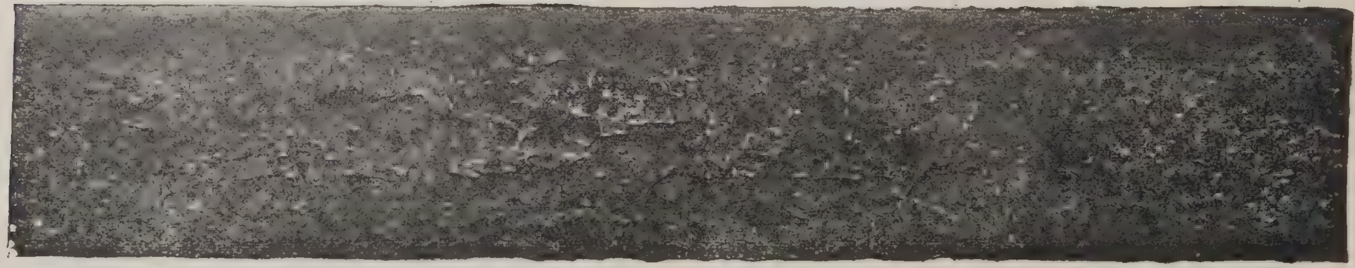


Fig. 5—Wrought Iron Pipe.

Fig. 6—"NATIONAL" Spellerized Mild Steel Pipe.

Samples of "NATIONAL" and wrought iron pipe immersed in running mine water in West Pennsylvania coal mine. Comparative loss by corrosion—Wrought Iron, 100 per cent; "NATIONAL" PIPE, 73 per cent.

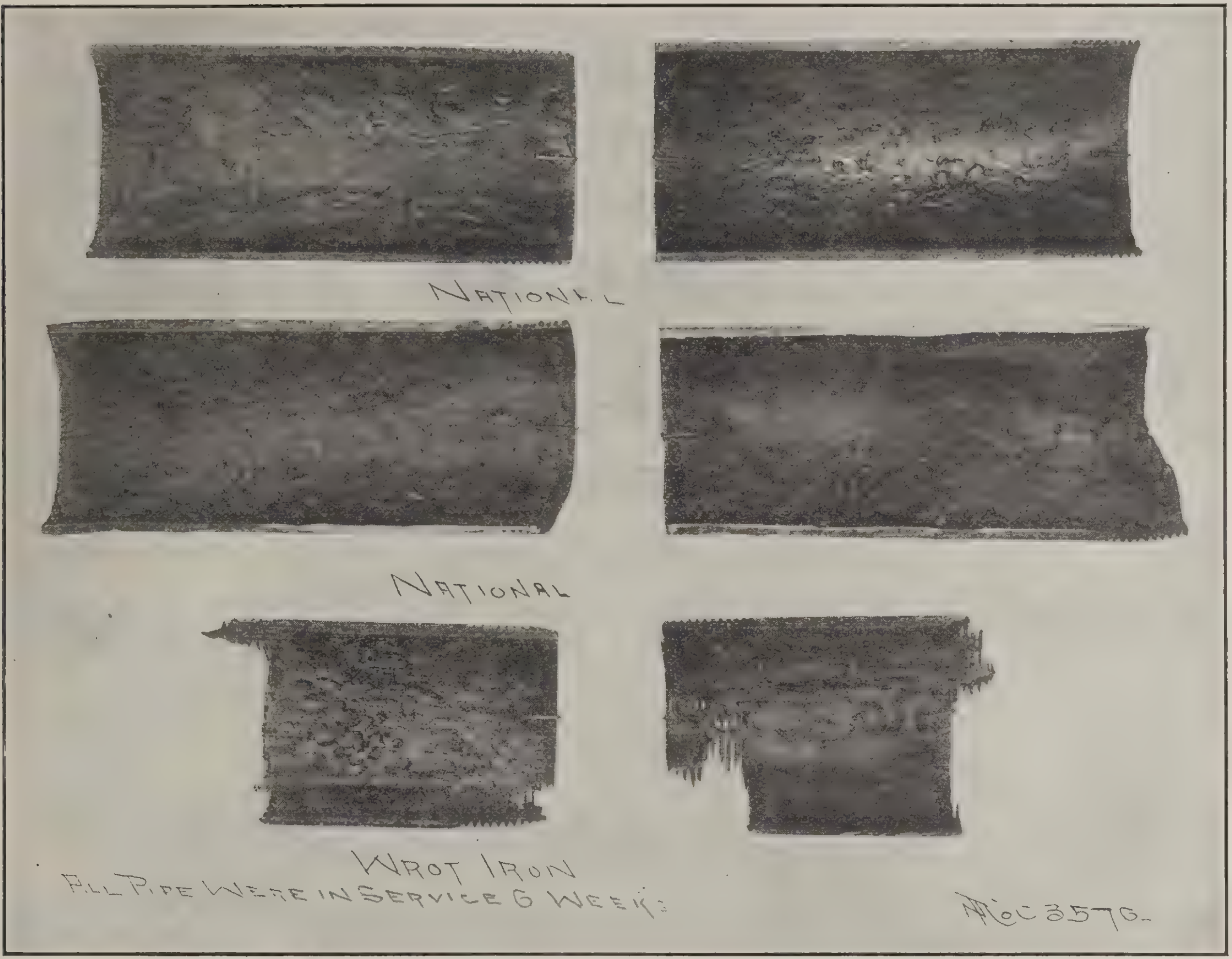


Fig. 7
Wrought iron and "NATIONAL" Pipe after six weeks service in coal mine test in the anthracite coal fields of northeastern Pennsylvania. The pipes were installed in a coal washing plant.

of Honor represented 100 points of excellence, but the **Grand Prize** ranks still higher—in fact, the **Grand Prize** represents "Overshadowing Supremacy."

Q. Has the **Grand Prize** improved the quality of "NATIONAL" Pipe?

A. No; the award is only the recognition by the consumer of the superior quality, inherent in "NATIONAL" Pipe.

IX—"NATIONAL" Pipe and Allied Products in Literature.

Q. Is there any literature concerning "NATIONAL" and Allied Products?

A. Yes; there are many important publications concerning "NATIONAL" Pipe and Allied Products which may be had upon application to the nearest District Sales Office of National Tube Company, (shown on page 446. These include "NATIONAL" Bulletins (1 to 26 inclusive) and each covers the application of pipe to a particular field of service. National Tube Company will be glad to send to those whose activities indicate a legitimate use any of these Bulletins or other publications upon receipt of definite information as to the character of service on which information is desired.

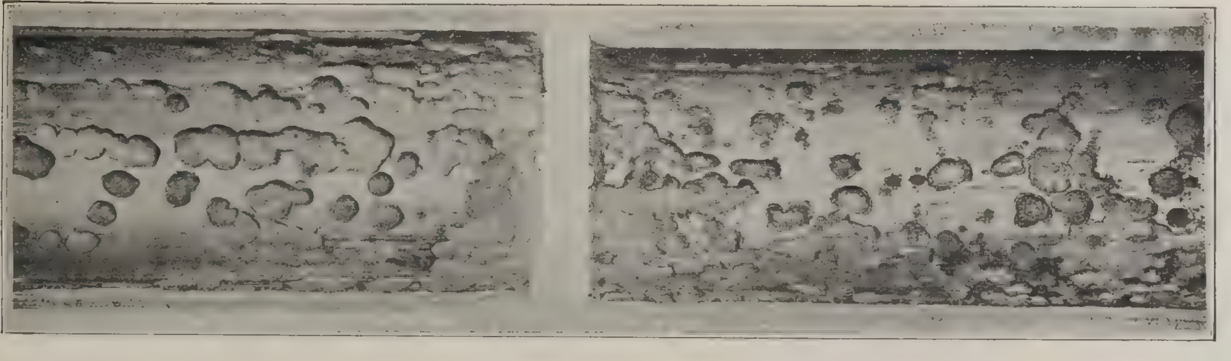


Fig. 8
Characteristic corrosion of two pipe materials from Frick Coke Co. investigation. Deepest pit in steel is .118" and in iron .129".

KEYSTONE CONSOLIDATED PUBLISHING COMPANY INC.

THE. MINING CATALOG
COMBINED WITH
COAL FIELD DIRECTORY

MINE LOCOMOTIVE SECTION

Engineering Data

Specification Data.
Table—Gross Tons Hauled by Electric Locomotives, average track conditions.
Sizes of Rail for various weights of Locomotives
Relation of Wheel Base to Radius of Minimum Curve.

The following manufacturers have catalogue descriptions in this section:

Alexander Car Replacer & Mfg. Co.
Crouse-Hinds Co.
Edison Storage Battery Co.
Electric Carrier Co.
Electric Storage Battery Co.
General Electric Co.
Goodman Mfg. Co.
Gould Storage Battery Co.
Hess-Bright Mfg. Co.
Indiana Foundry Co.
Ironton Engine Co.
Jeffrey Mfg. Co.
Mancha Storage Battery Loco. Co.
Milwaukee Locomotive Mfg. Co.
Morgan-Gardner Electric Co.
Nuttall, R. D., Co.
Pennsylvania Casting & Mch. Works.
Philadelphia Storage Battery Co.
Porter, H. K., Co.
S. K. F. Ball Bearing Co.
Tool Steel Gear & Pinion Co.
Van Dorn & Dutton Co.
Vulcan Iron Works.
Westinghouse Electric & Mfg. Co.
Whitcomb, Geo. D., Co.

For additional descriptions of Mine Locomotives and Equipment, not appearing in this section, refer to Index of Products in front of book.

Specification Data for Haulage Locomotives

Type Required

Electric
Compressed Air
Gasoline
Steam
Storage Battery

Size or Weight Locomotive Required.

Number Required

Dimensions

Maximum width locomotive can have
Maximum height locomotive can have
Is it necessary to take apart to install (in case of shaft mine?)

Track

Weight of Rail ...... lbs. per yard.
Exact gauge of track on straight haul
Exact gauge of track on curves
Radius of shortest curve in feet from center of track
Length of shortest curve
Average length of haul

†Grades

Maximum grade in favor of load is...% for...ft.
Maximum grade against load is ....% for ....ft.
What is the average grade and is it in favor or against the load
Length of maximum grade (in favor of load ....
Length of maximum grade (against load ....
If curves occur on grade, what is radius and grade

Haulage Conditions

Width of entry
Height of entry over rail and at lowest point in rooms
Clearance each side of track
Number Cars to be hauled per day
Number Cars per trip
Number of places to haul from

*Cars

Length of Pit Car
Width of Pit Car
Weight of Pit Car empty
Weight of Pit Car and load
Diameter of Pit Car Wheel
Length of Wheel Base
Do Pit Cars have single or double bumpers
Height from top of rail to top of bumper
Height from top of rail to bottom of bumper
Width from outside to outside of bumpers
Height from top of rail to center of hitching
Dimensions of coupling—length and width, inside and outside

Trolley Wire (Use this for electric locomotives).

Location—Right or left side going toward face
Distance of trolley wire outside of track rail
Highest point in trolley wire above rail
Lowest point in trolley wire above rail
Location of motorman
Voltage
For gathering locomotive, give longest haul locomotive must make using cable

Gasoline Locomotives

Is haul inside or outside
Kind of liquid fuel available
Altitude above sea level
State ventilating conditions

Compressed Air Locomotives

Elevation above sea level of compressor location
Will compressor be operated by steam or water power
If steam, state pressure
If slope mine give length and pitch
If shaft mine give depth
Give distance from convenient location for compressor to head of shaft or slope
If drift mine, state distance from convenient location for compressor to parting outside where locomotive will deliver loaded cars.

Storage Battery Locomotives

What source of power, giving voltage, etc., will be used to charge locomotive batteries?
Number of entries to be served for gathering locomotive
Number working rooms to be served on each entry
Give a schedule of the service required of the locomotive, stating when at work and when idle throughout the twenty-four hours?
Will it be possible to give the battery a boosting charge at any time during the day?

*Note:—

If possible, it is expedient to furnish drawings of cars showing draught rigging so that locomotive may be arranged to suit.

†Note:—

A sketch or better, a map of your tracks with notations thereon in regard to grades and elevations at various points and referring to the weights of, or number of carloads of material which must be hauled between the various points per hour or in 5, 8 or 10 hours, and with a convenient location for the compressor indicated, usually gives a much clearer idea of your requirements than it is possible to give by tabulated method. A profile of important roads, or those where excessive or irregular grades occur may also suggest important alterations in the equipment. If haulage roads are to be lengthened, indicate which ones, and at what rate in feet per year they may be expected to increase in length. If the quantities to be hauled will increase, state how soon and how much. Also what lengths of haul and what quantities you wish to provide for in making the initial installation.

Gross Tons Hauled by Electric Locomotives

TABLE A. HAULAGE CAPACITY OF ELECTRIC MINE LOCOMOTIVES EQUIPPED WITH CAST CHILLED WHEELS

This table gives the drawbar pull in pounds and the haulage capacity in tons for a given weight of locomotive on various grades, when equipped with chilled cast-iron wheels. A co-efficient of friction of 30 lb. per ton has been assumed on level track, and 20 lb. per ton for each per cent. of grade.

Grade	Level		1%		2%		3%		4%		5%		6%		7%		8%		9%		10%	
Loco. Wght., tons	Drawbar Pull, lb.	Haulage Cap., tons	Drawbar Pull, lb.	Haulage Cap., tons	Drawbar Pull, lb.	Haulage Cap., tons	Drawbar Pull, lb.	Haulage Cap., tons	Drawbar Pull, lb.	Haulage Cap., tons	Drawbar Pull, lb.	Haulage Cap., tons	Drawbar Pull, lb.	Haulage Cap., tons	Drawbar Pull, lb.	Haulage Cap., tons	Drawbar Pull, lb.	Haulage Cap., tons	Drawbar Pull, lb.	Haulage Cap., tons	Drawbar Pull, lb.	Haulage Cap., tons
3	1200	40	1140	23	1080	15	1020	11	960	9	900	7	840	6	780	5	720	4	640	3	600	2
4	1600	53	1520	31	1440	20	1360	15	1280	12	1200	9	1120	7	1040	6	960	5	880	4	800	3
5	2000	67	1900	38	1800	26	1700	19	1600	15	1500	11	1400	9	1300	8	1200	6	1100	5	1000	4
6	2400	80	2280	45	2160	31	2040	23	1922	17	1800	14	1680	11	1560	9	1440	7	1320	6	1200	5
7	2800	93	2660	53	2520	36	2300	25	2240	20	2100	16	1960	13	1820	11	1680	9	1540	7	1400	6
8	3200	107	3040	61	2880	41	2720	30	2560	23	2400	18	2240	15	2080	12	1920	10	1760	8	1600	7
10	4000	133	3800	76	3600	51	3400	38	3200	29	3000	23	2800	19	2600	15	2400	13	2200	10	2000	9
12	4800	160	4560	91	4320	62	4080	45	3840	35	3600	28	3360	22	3120	18	2880	15	2640	13	2400	10
13	5200	174	4940	98	4680	67	4420	49	4160	38	3900	30	3640	24	3380	20	3120	16	2860	14	2600	11
15	6000	200	5700	114	5400	77	5100	57	4800	43	4500	35	4200	28	3900	23	3600	19	3300	16	3000	13
17	6800	226	6460	129	6120	87	5780	64	5440	49	5100	39	4760	32	4420	26	4080	21	3740	18	3400	15
18	7200	240	6840	136	6480	92	6120	68	5760	52	5400	41	5040	34	4680	28	4320	23	3960	19	3600	16
20	8000	267	7600	152	7200	103	6800	75	6400	58	6000	46	5600	37	5200	31	4800	27	4400	21	4000	17
25	10000	330	9500	190	9000	118	8500	95	8000	72	7500	58	7000	46	6500	38	6000	32	5500	26	5000	22
30	12000	400	11400	227	10800	156	10200	113	9600	87	9000	70	8400	56	7800	46	7200	38	6600	32	6000	26

TABLE B. HAULAGE CAPACITY OF ELECTRIC MINE LOCOMOTIVES EQUIPPED WITH STEEL-TIRED WHEELS

This table gives the drawbar pull in pounds and the haulage capacity in tons for a given weight of locomotive on various grades, when equipped with steel-tired wheels. A co-efficient of friction of 30 lb. per ton has been assumed on level track, and 20 lb. per ton for each per cent. of grade.

Grade	Level		1%		2%		3%		4%		5%		6%		7%		8%		9%		10%	
Loco. Wght., tons	Drawbar Pull, lb.	Haulage Cap., tons	Drawbar Pull, lb.	Haulage Cap., tons	Drawbar Pull, lb.	Haulage Cap., tons	Drawbar Pull, lb.	Haulage Cap., tons	Drawbar Pull, lb.	Haulage Cap., tons	Drawbar Pull, lb.	Haulage Cap., tons	Drawbar Pull, lb.	Haulage Cap., tons	Drawbar Pull, lb.	Haulage Cap., tons	Drawbar Pull, lb.	Haulage Cap., tons	Drawbar Pull, lb.	Haulage Cap., tons	Drawbar Pull, lb.	Haulage Cap., tons
3	1500	50	1440	29	1380	20	1320	15	1260	12	1200	9	1140	8	1080	6	1020	5	960	4	900	4
4	2000	70	1920	39	1840	26	1760	20	1680	15	1600	12	1520	10	1440	8	1360	7	1280	6	1200	5
5	2500	84	2400	48	2300	33	2200	24	2100	19	2000	15	1900	13	1800	10	1700	9	1600	8	1500	6
6	3000	100	2880	58	2760	39	2640	29	2520	23	2400	18	2280	15	2160	13	2040	11	1920	9	1800	8
7	3500	117	3360	67	3220	46	3080	34	2940	27	2800	22	2660	18	2520	15	2380	12	2240	11	2100	9
8	4000	133	3840	77	3680	53	3520	39	3360	30	3200	25	3040	20	2880	17	2720	14	2560	12	2400	10
10	5000	167	4800	96	4600	66	4400	49	4200	38	4000	31	3800	26	3600	21	3400	18	3200	15	3000	13
12	6000	200	5760	115	5520	79	5280	59	5040	46	4800	38	4560	30	4320	25	4080	21	3840	18	3600	16
13	6500	216	6240	126	5980	85	5720	63	5460	50	5200	40	4940	33	4680	27	4420	23	4160	20	3900	17
15	7500	250	7200	144	6900	99	6600	73	6300	57	6000	46	5700	38	5400	32	5100	27	4800	23	4500	19
17	8500	283	8160	163	7820	112	7480	83	7140	65	6800	52	6460	43	6120	36	5780	30	5420	26	5100	22
18	9000	300	8640	173	8280	118	7920	88	7560	68	7200	55	6840	45	6500	38	6120	32	5760	27	5400	23
20	10000	333	9600	192	9200	132	8800	98	8400	76	8000	62	7600	51	7200	42	6800	36	6400	30	6000	26
25	12500	416	12000	240	11500	164	11000	122	10500	96	10000	77	9500	64	9000	53	8500	45	8000	38	7500	32
30	15000	500	14400	287	13800	197	13200	146	12600	114	12000	92	11400	76	10800	63	10200	53	9600	46	9000	39

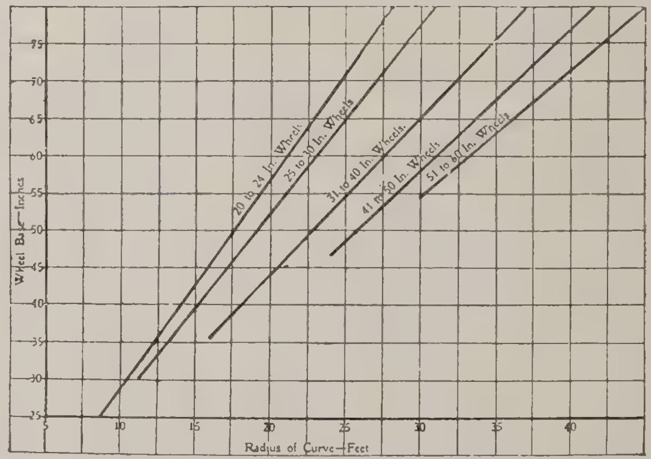
Courtesy Jeffrey Manufacturing Co.

Minimum Sizes of Rails

Minimum sizes of rail recommended for mine locomotives are given in the following table. The values are approximate only, as the proper weight, or size, of rail that should be used is determined by the character of the road bed, the spacing of ties, and general construction. For average conditions in general mine and industrial service, rails of the following minimum sizes are recommended:

Weight of Locomotive in Tons	Weight of Rails in Pounds Per Yard
4 to 6	16
6 to 8	20
8 to 10	25
10 to 13	30
13 to 15	40
15 to 20	50

RELATION OF WHEEL BASE TO RADIUS OF MINIMUM CURVE



The graphical statement of this relation given by the curves is plotted from values obtained from a formula given in the Baldwin Locomotive Works' "Locomotive Data." Experience has shown the values to be safe ones for standard wheel, flange, and truck play. To insure that the curves will give safe results, the same gauge is assumed on curves as on tangent track. If a liberal "spread" is provided in the track at curves, the values of the curves for wheel base may be increased by from 10 to 25 per cent.

Courtesy Westinghouse Electric & M'f'g Co.

GENERAL ELECTRIC COMPANY

General Offices.
Schenectady, N. Y.

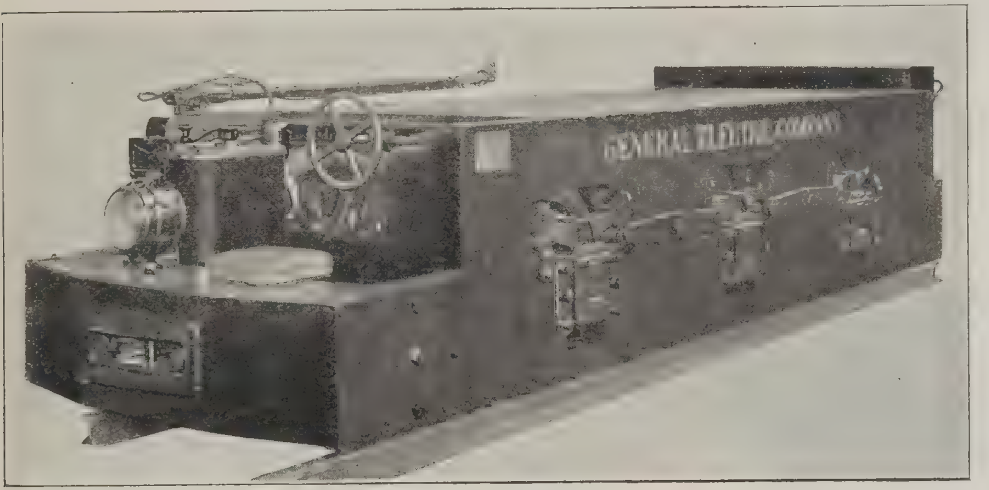
The Guarantee on Goods of Excellence Electrical

Sales Offices
In All Large Cities

Electrical Equipment for Mines---Locomotives

Many types of mining locomotives are manufactured by the General Electric Company. For any given set of haulage conditious just the right type of locomotive can be selected. The wide choice possible makes compromises unnecessary. Two representative types of these locomotives are illustrated to show the wide variety available.

The locomotive shown at the bottom of this column weighs six tons, is 42″ track gauge and will develop a maximum draw bar pull of 3500 pounds. When desired it can be built for a minimum track gauge of 30″. It will operate from either a 250-volt trolley or its self-contained storage battery. The change from trolley to storage battery operation is made entirely automatic, by a switch which makes the necessary connections without attention from the operator. This locomotive's storage battery is automatically charged when locomotive is running from trolley wire.



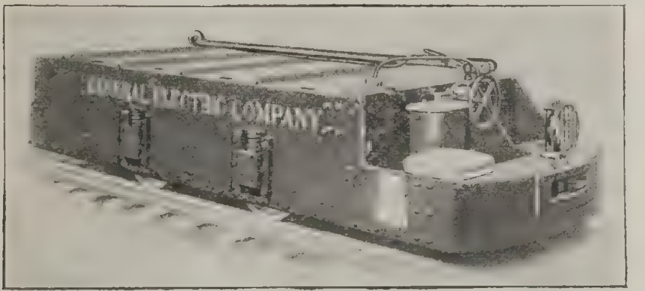
20 Ton G-E Mining Locomotive, Rochester and Pittsburgh Coal and Iron Co., Punxsutawney, Pa.

Straight storage battery locomotives without trolley operating feature are furnished when desired. These locomotives are more than meeting the high expectations of users generally.

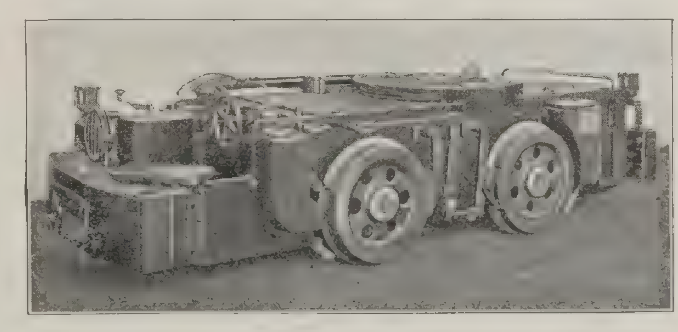
The locomotive at the left was built for underground haulage at Rochester and Pittsburg Coal and Iron Company. It is equipped with three 85 H. P. motors, each provided with ball bearings which prevent armature from touching pole pieces, keep oil out of motor, maintain commutator in alignment, cut down bearing friction and reduce quantity of lubricant required. Sparkless commutation is assured by the use of a special motor construction. Although this locomotive has a long wheel base, it is easy on track. It weighs twenty tons and will develop a maximum draw bar pull of twelve thousand pounds. Great strength is assured by massive rolled steel side frames.

The locomotive below can be operated between working face and entry without a trolley wire. Simply hook the cable to entry trolley; throw in motor switch and operate locomotive forward or backward without fear of over-running or kinking cable.

Constant tension on cable is obtained by a ball-bearing motor geared to a ball-bearing reel. The motor is always connected across the power line, acting as an endless spring. It runs as a motor when reeling in cable, and as a generator when paying out cable. It maintains a firm pull, and will not burn out when locomotive is standing still. The motor is under the reel and completely protected from falling top. Mechanical springs catch and break, chain drives are complicated and expensive to maintain,—friction drives are non-positive and wear rapidly—the "electric spring" has none of these disadvantages.



Combination Storgae Battery and 250 Volt Trolley Locomotive.



Gathering Locomotive.

GOODMAN MANUFACTURING CO.

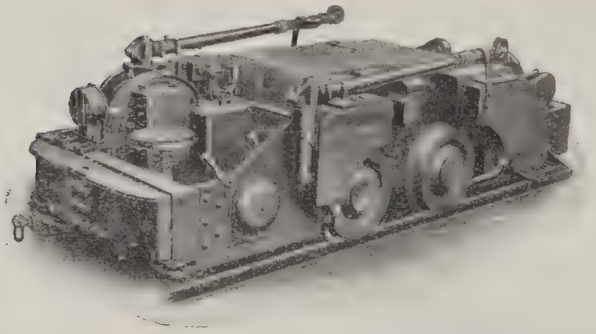
ELECTRIC MINING MACHINERY

General Office and Works: Chicago, Ill., Halsted Street at 48th Place.

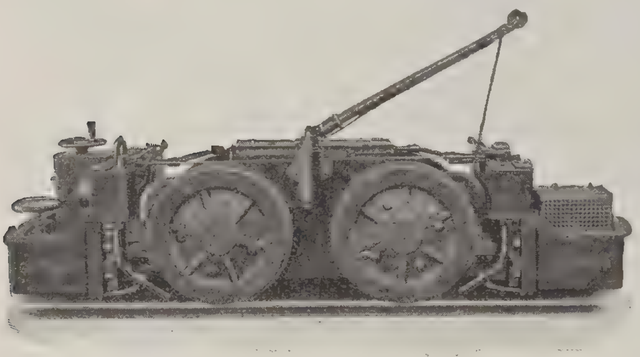
BRANCH OFFICES AND REPRESENTATIVES:

PITTSBURGH, PA.—Farmers Bank Bldg.
CINCINNATI, O.—220 East Fourth Street.
CHARLESTOWN, W. VA.—Union Bldg.
BIRMINGHAM, ALA.—Brown-Marx Bldg.
NEW YORK, N. Y.—200 Fifth Avenue.
ST. LOUIS, MO.—Boatmen's Bank Bldg.
DENVER, COLO.—Boston Bldg.
SEATTLE, WASH.—512 First Ave., South.

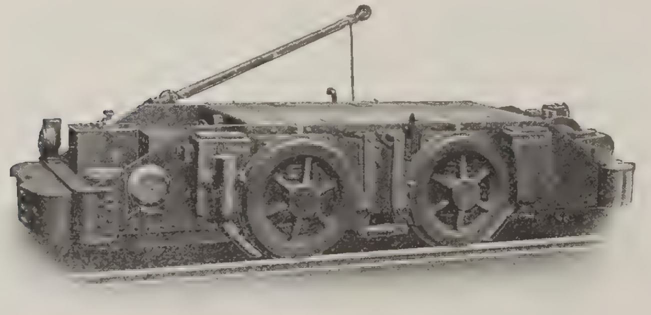
AUSTRALASIA—Wm. Adams & Co., Sydney, N. S. W.



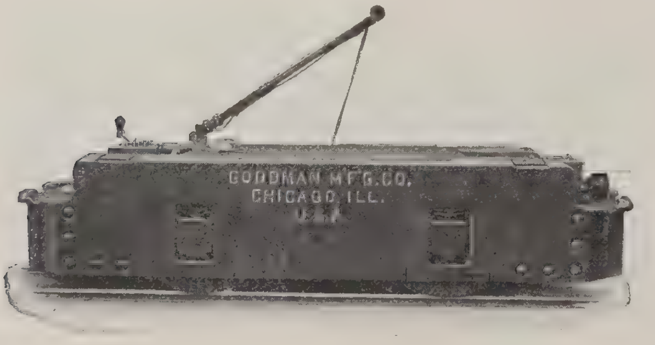
Low Vein "Universal Gatherer, with Electric Cable Reel and Crab Reel.



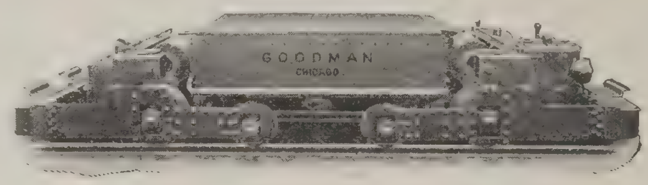
Single-Motor Haulage Locomotive. Unit Drive for All Four Wheels.



Two-Motor Haulage Locomotive, with Plate Steel Frame and Outside Wheels.



Two-Motor Haulage Locomotive, with Cast Steel Frame and Inside Wheels.



Storage Battery Locomotive, Articulated Type.

An Electric Locomotive For Every Mine Service

Trolley, Storage Battery and Rack Rail Types.

Gathering Locomotives

In numerous types and sizes for car distribution and gathering under all systems of operation. Plain locomotives for entry gathering and simple switching. Electric cable reel locomotives for working to the face in rooms and entries. Crab reel locomotives for reaching to a distance with a wire rope to place or get a car in dip rooms, etc. Combination electric cable and crab reel locomotives as truly "Universal" gatherers. Bulletin No. 503.

Storage Battery Locomotives

For gathering and light haulage. The articulated construction, with battery carried low, between two bogy trucks. Four wheels driven, four idle. All working parts accessible. Easy operation around sharp curves. Fitted with trolley pole when desired for combination service. Bulletin No. 521.

Single-Motor Traction Haulage Locomotives

As maximum load pullers per ton of weight. All the advantages of unit drive, and of simplified construction and larger parts as compared to the greater number of smaller parts in two-motor types. All parts accessible from above—no pit work. Bulletin No. 402.

Two-Motor Traction Haulage Locomotives

In various forms of frame construction, motor arrangement, etc., to suit purchaser's preferences and operative requirements. Steel frames, with spring bumpers and spring draft gearing. Bulletin No. 451.

Rack Rail Locomotives

For positive haulage in hilly mines where grades make traction haulage difficult or uneconomical. Avoids the limitations of adhesion as a tractive basis and gives full value to the motor horsepower. Bulltin No. 301.

MORGAN-GARDNER ELECTRIC CO.

68 E. Adams St., Chicago, Ills.

MINING LOCOMOTIVES

LOCOMOTIVES

For Main Line Haulage and Gathering

Morgan-Gardner class "C" and "CC" Locomotives are the result of careful study in safety, track behavior, electrical and mechanical construction. Features necessary in an ideal locomotive.

Built in single or two motor types, varying in weight from 5 to 20 tons. Construction low, short and narrow with short wheel base and flexible truck.

Shock absorbtion receives special attention. The main journal frame is spring supported on axles, motor spring supported and cushioned on journal frame. Smooth control with combination spring buffers and drawheads eliminate bumps and jerks. Main frame is supported on motor truck and collisions cannot interfere with alignment of working parts.

Enclosing the motor, gearing, ball and bronze bearings eliminates grit and dirt. All gears and ball bearings run in grease.

Heat troubles are prevented by the use of a medium speed motor with proportionate gear reduction, interpoles give sparkless commutation, pole pieces are laminated, the large roomy motor with liberally designed parts and internal circulation of air assures low temperature rise. So over-motored that wheels may be slipped without injury to motor. Smooth control with gradual speed acceleration prevent sudden and large rushes of current.

All parts of locomotive are accessible from above, armature or whole motor can be easily removed.

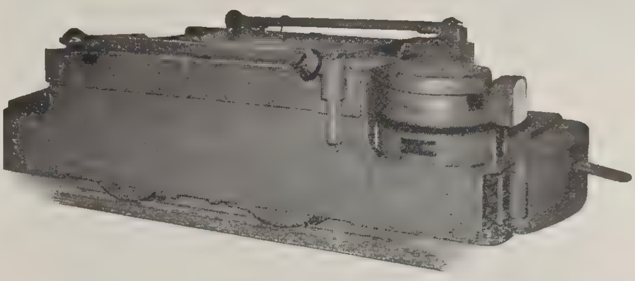
The armature is of the drum wound type, coils are thoroughly insulated in the armature core. Self aligning ball bearings of ample proportions insure cool running and long life, protects the armature from striking pole pieces, maintains a uniform air gap and true running commutator.

Gathering locomotives are fitted with Automatic Cable Reel for advance work and self contained motor driven Gathering Crab.

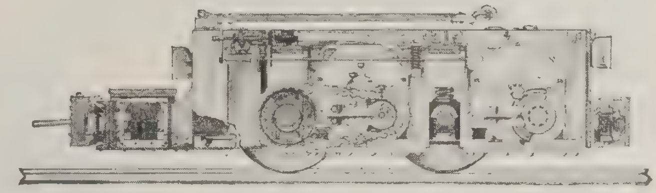
The automatic cable reel is simple in construction and operation and will properly handle 350 feet of electric cable under any working conditions.

The gathering crab is of compact construction, substantial in every detail. Length of cable 300 to 500 feet. Pulling power 1200 pounds at a speed of 300 feet per minute.

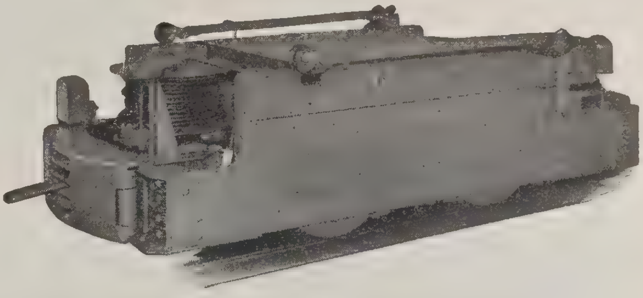
Special features treated in detail in catalogue No. 57 are Magnetic Blowout Controller, Grid Rheostat, Quick Acting Brake and Sanding Device.



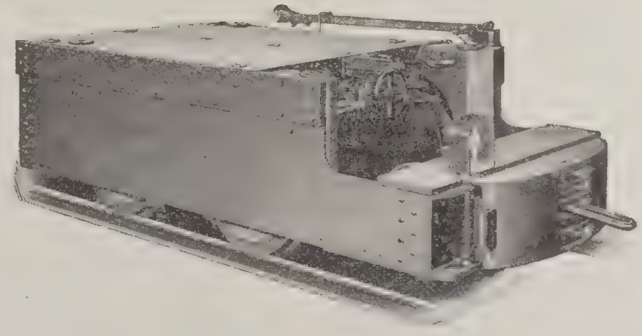
5-Ton Locomotive with Gathering Crab.



Heavy Haulage Motors of Modern Construction.



6-Ton Locomotive with Crab and Automatic Cable Reel.



Two-Motor Haulage Locomotives.

MORGAN-GARDNER
68 E. ADAMS ST "ELECTRIC CO." CHICAGO U.S.A.

THE JEFFREY MANUFACTURING COMPANY

Main Office and Works: 962 North Fourth St., Columbus' Ohio

SALES OFFICES:

New York............50 Dey Street
Boston.............141 Milk Street
Philadelphia.Real Estate Trust Bldg.
Pittsburgh.....Farmers Bank Bldg.
Scranton, Pa..Union Nat. Bank Bldg.
Broadwell, O.......H. H. Townsend
Middlesboro, Ky..Middlesboro Hotel
Charleston ....West Virginia
Chicago ....McCormick Bldg.
St. Louis...Railway Exchange Bldg.
Milwaukee...........M. & M. Bldg.
Denver....First National Bank Bldg.
Seattle...........L. C. Smith Bldg.
Birmingham......Brown-Marx Bldg.
Dallas........................
..Commonwealth Nat. Bank Bldg.
Canadian Works ....Montreal

Electric Haulage Locomotives

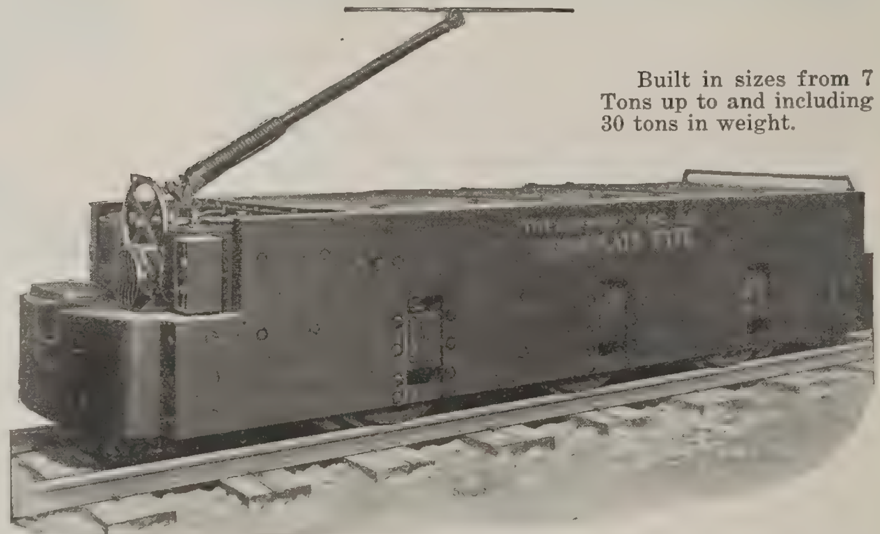
THE JEFFREY "ARMORPLATE" TYPE MAIN HAULAGE LOCOMOTIVE

Has Features Distinctive for Reliability and Haulage Economy.

All parts strongly built—yet simple in design and construction and readily accessible.

Top half of each motor can be lifted out, if desired, without disturbing top half of gear case, motor suspension or brake hangers.

Wheels and Axles removable without disturbing motor suspension.



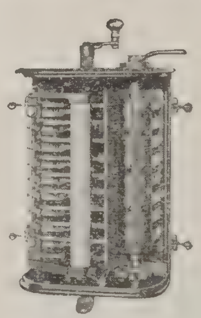
Built in sizes from 7 Tons up to and including 30 tons in weight.

Heavy Capacity Ball Bearing Motors

Eliminate 90% of the ordinary mechanical troubles experienced by the use of Bushed Bearings.

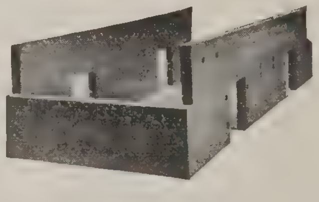
The Ball Bearings do away with bearing wear on the armatures, insuring maximum continuous service.

Motors cannot be overheated regardless of the weight of trip or the percentage of adverse grades.



Jeffrey Improved Locomotive Controller

Note the long Solenoid Coil located above the controller fingers just above where the current is broken. The arc at the fingers is blown out from the fingers and not directly against the arc deflectors. The arc deflectors are arranged in the form of shelac and are separate, making repairs easy and cheap. The controller finger supports are bolted to the finger board by through bolts in place of wood screws as formerly used.



Armorplate Type Locomotive Frame

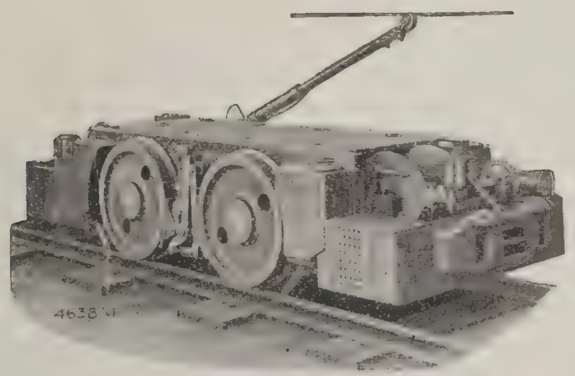
Built of solid steel slabs 2½" to 6" thick—it needs no guarantee against breakage. This type of frame permits for a given weight of locomotive of the largest possible motor capacity for a given gauge, as well as greater accessibility to parts.

New Style Journal Box For Inside Wheel Type Locomotives

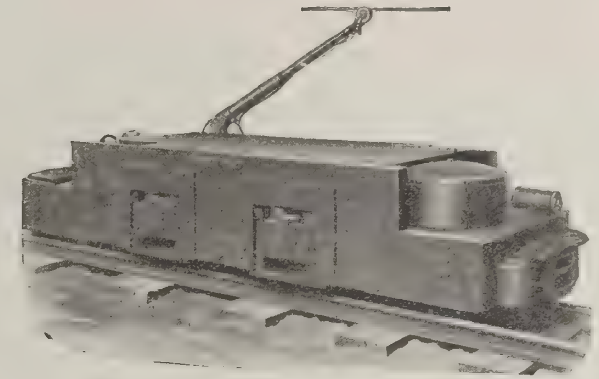
Hardened Steel Plate in the journal box lid takes the end thrust of a Hardened Steel Pin in the end of the axle. This construction eliminates wear between the wheel hubs and the inside of the journal box face and keeps the frame from having too much lateral motion.

THE JEFFREY MANUFACTURING COMPANY

Electric Gathering Locomotives

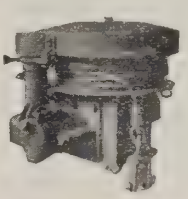


Cable Reel Type Locomotive
for gathering loaded cars under practically all mining conditions. Low overall height. Various types of reels.



Crab Type Locomotive
Particularly useful where rooms run to the dip, or where the cars are light and the room track level.

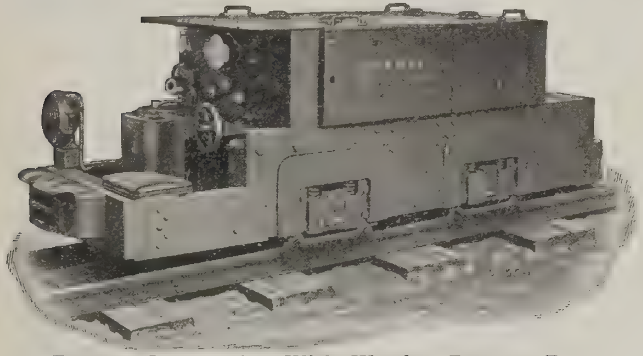
Standard Cable Reel Device
either motor or mechanically driven.



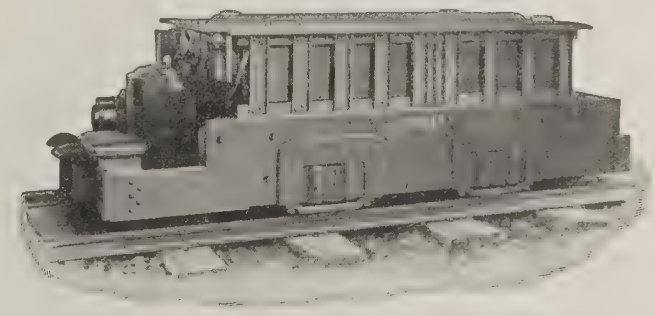
Standard Crab Reel Device. Rope.
Combination Crab and Cable Reels also furnished.

STORAGE BATTERY GATHERING LOCOMOTIVES.

Equipped with either Edison or Ironclad Exide Cells.



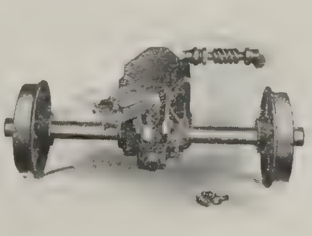
Battery Locomotive With Wooden Battery Box.



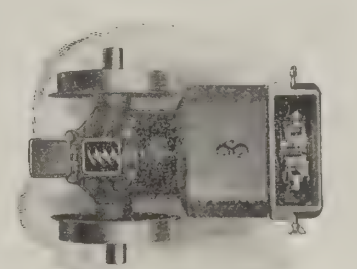
Battery Locomotive With Structural Steel Battery Box.

Practical, Economical and Reliable for gathering purposes where the average grade is not excessive. Operation is not restricted by the length of cable. Economical in upkeep because it does away with the cost of trolley wire, feeding, rail bonding and flexible cables, and the consequent repair costs. The most flexible form of mechanical haulage yet devised.

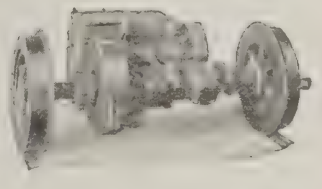
Motor Type M. H. 108.
Used on Battery Locomotives. Designed for minimum gauge of 18".



The Worm Drive
on Jeffrey Battery Locomotives has a mechanical efficiency of 95%.



Note the large commutator door with accessible brushes and holders, and large commutator.



Motor Type M. H. 124.

WESTINGHOUSE ELECTRIC & M'F'G CO.

EAST PITTSBURGH, PA.

THE BALDWIN LOCOMOTIVE WORKS

PHILADELPHIA, PA.

Everywhere Successful

Mine and Industrial Locomotives

Sold f. o. b. Philadelphia, Pa., with actual freight allowed to all points on or east of the Mississippi River. To points west of the Mississippi River actual freight is allowed to the point of crossing.

Prices cover complete standard equipment with single-end control, including two ball-bearing motors, cast chilled wheels, two incandescent headlights, one trolley pole, hand brakes, and fuses for all equipments.

Bar-steel frames are standard on all equipments.

The motors are commutating pole throughout.

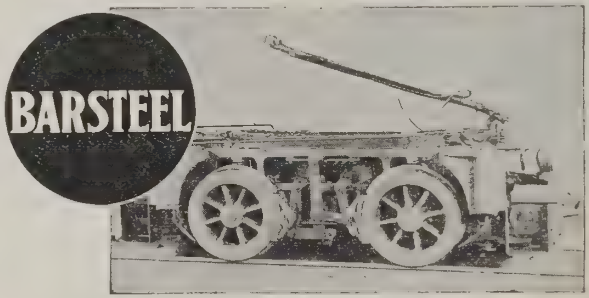
Net Weight—Tons	Wheels Chilled Iron		Wheels Steel Tired	
	†Rated D.B.P. in Lbs. Level Track	†Max. Tractive Effort in Lbs.	†Rated D.B.P. in Lbs. Level Track	†Max. Tractive Effort in Lbs.
Two-Motor Locomotives.				
3½	1400	1750	1750	2100
4	1600	2000	2000	2400
4	1600	2000	2000	2400
5	2000	2500	2500	3000
5	2000	2500	2500	3000
6	2400	3000	3000	3600
6	2400	3000	3000	3600
7	2800	3500	3500	4200
7	2800	3500	3500	4200
8	3200	4000	4000	4800
8	3200	4000	4000	4800
10	4000	5000	5000	6000
10	4000	5000	5000	6000
13	5200	6500	6500	7800
13*	5200	6500	6500	7800
15*	6000	7500	7500	9000
15	6000	7500	7500	9000
20	8000	10000	10000	12000
20	8000	10000	10000	12000
25	10000	12500	12500	15000
Three-Motor Locomotives.				
15	6000	7500	7500	9000
15‡	6000	7500	7500	9000
20‡	8000	10000	10000	12000
20	8000	10000	10000	12000
25	10000	12500	12500	15000
25	10000	12500	12500	15000
30	12000	15000	15000	18000
30§	12000	15000	15000	18000
35§	14000	17500	17500	21000

Storage Battery Locomotives for all requirements. Following are three common standards:

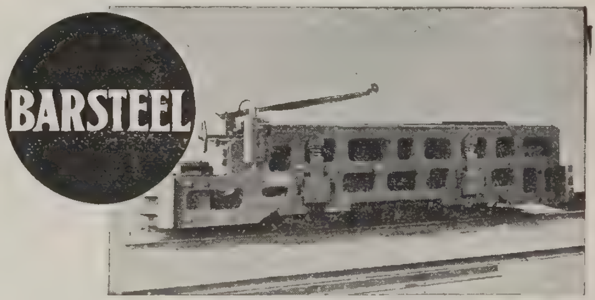
Chassis Weight.	D. B. P.	M. P. H.	Max. Kw. Hours.
6000	1200	3.5	20.8 to 23.8
7000	1600	3.5	26.6 to 29.7
8000	2000	3.5	35.5

Everywhere coal is mined you will find the BARSTEEL delivering the goods.

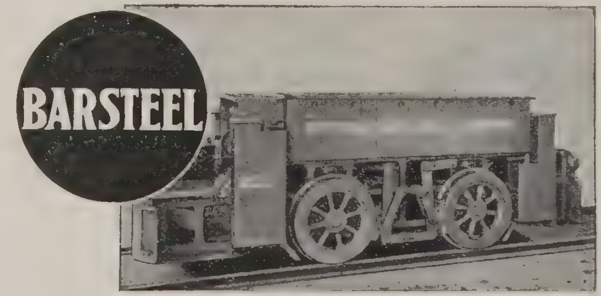
25-Ton—Berwind-White Coal Co., Windber, Pa.



6-Ton—Clinchfield Coal Corp., Dante, Va.



20-Ton—Johnston City Coal Co., Johnston City, Mo.



Battery Locomotive—Pittsburgh Coal Co., Pittsburgh, Pa.

ELECTRIC CARRIER COMPANY

220 BROADWAY, NEW YORK

Manufacturers of

Electric Locomotives

This Locomotive Operates on an 18% Grade

This locomotive is doing what no wheel traction system can do. It is being used to pull coal cars in and out of the rooms of a mine on an 18% grade.

The method of propulsion is new. Instead of mounting a motor upon the car and transmitting mechanical power therefrom through gears to the wheels of the car, the elements of a polyphase induction motor are separated and straightened out; one of the elements being placed on the bottom of the car, the other between the rails on the track. Pinions, gears, racks and moving parts are eliminated.

Weight is not required, as the pull is not dependent on wheel traction. This locomotive weighs only 1300 lbs. Cars can be started, speeded up, slowed down, stopped or reversed and switched automatically from the main to branch lines.

The longer the line the more rapid, reliable and economical the operation. When descending grades, power is regenerated back into the line, serving as a brake and also reducing the consumption from the power house. The speed of the cars is regulated by the frequency of the current and collisions are impossible. The track can be constructed as a portable railroad, and extended by adding sections. This new type of locomotive was described in COAL AGE some months ago. It is now a PRACTICAL WORKING PROPOSITION.

Why two trolley poles? Using polyphase currents require two poles and a ground.

Does it consume more power than an ordinary locomotive? Conditions being the same the power consumed would be less, because this locomotive weighs less than any kind of wheel traction locomotive.

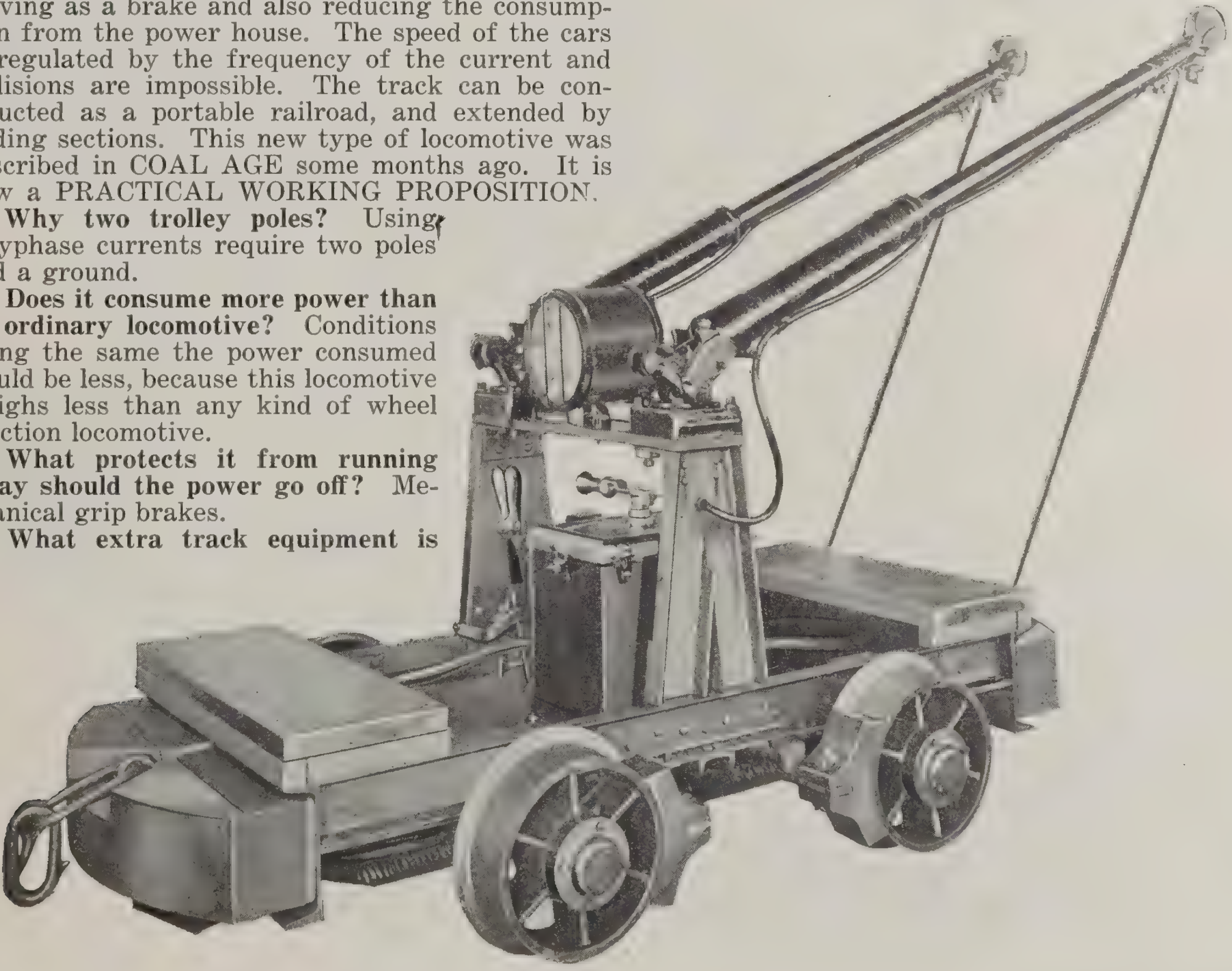
What protects it from running away should the power go off? Mechanical grip brakes.

What extra track equipment is required? A secondary motor member between the rails, normally about 3″ wide.

What is the maximum tonnage handled by this locomotive? Any desired pull or push can be developed, depending on the size of the motor elements. For heavy grades inside a mine an articulated locomotive, consisting of two or more small units coupled together, is recommended, these to be used separately on level grades.

Does it require technical electrical knowledge to operate it? No. On account of its simplicity, less experience is required than with other locomotives.

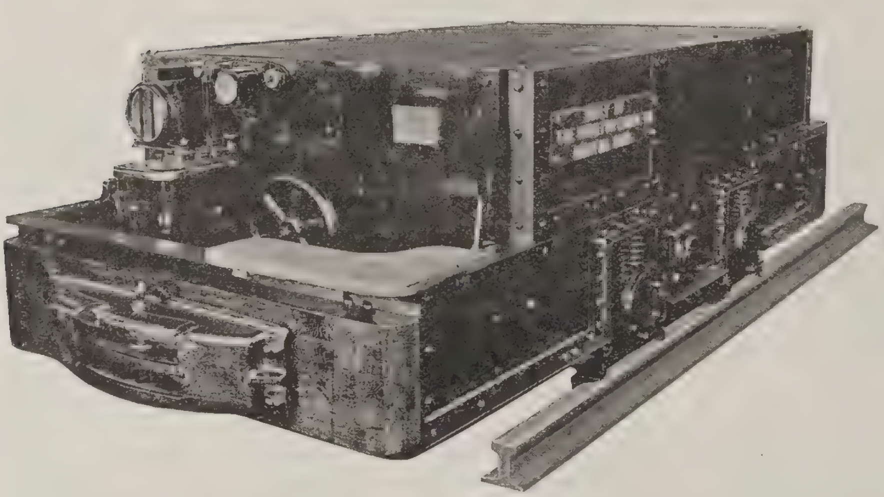
Is 18% the maximum grade it will operate on? L. B. Stillwell and H. S. Putnam, after testing the operation on a 20% grade, reported: "As nearly as could be observed, the speed was maintained practically uniform throughout. . . . It is entirely possible to ascend extremely heavy grades without difficulty. . . . It would be impossible to climb a 20% grade with any system using electric motors installed on the car."



THE IRONTON ENGINE COMPANY

IRONTON, OHIO

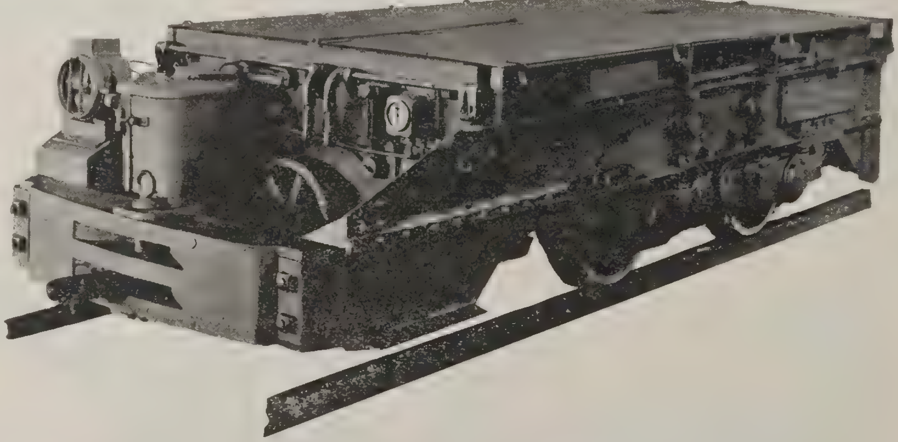
Electric Storage Battery Locomotives



High Type Electric Storage Battery Locomotive, for gathering and main line haulage.

These Locomotives are the most modern type on the market, and we invite the closest inspection of their mechanical construction and actual working conditions at mines.

A modern plant manufacturing as a specialty Storage Battery Locomotives.



Low Type Electric Storage Battery Locomotive, for gathering purposes.

PLANT OF
THE IRONTON ENGINE CO.
IRONTON, O.

Mancha Storage Battery Locomotive Co.

General Offices & Works
ST. LOUIS, MO

Manufacturers of Storage Battery Locomotives

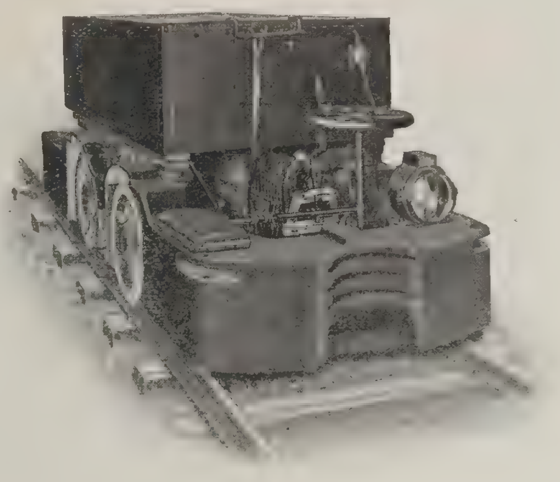
Products
Electric Storage Battery Locomotives.

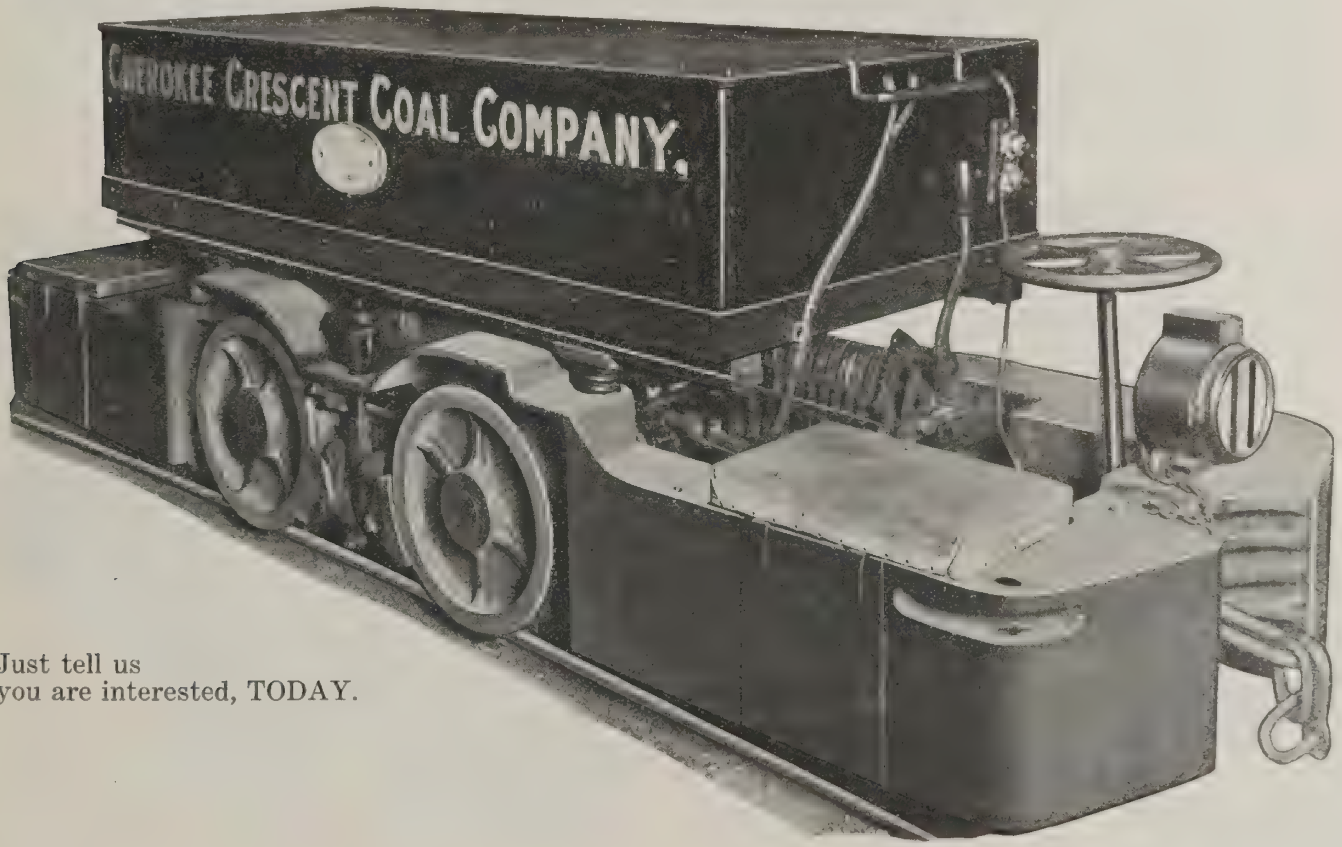
The cost of gathering and haulage of coal in coal mines has been reduced to a minimum by the installation of

"MANCHA'S ELECTRIC MULE."

The illustration below shows our locomotive in a mine where old mine mules did the job for a long time with considerable waste of time and money, so our Electric Mule was put in on trial, and just as we expected, it proved more economical from every angle—installation, maintenance, operation and care.

This is but ONE instance where Mancha's Electric Mules have shown marked success. We will be glad to tell you of numerous other instances, and to offer you an opportunity of trying out the Electric Mule in your mine at OUR cost.





Just tell us
you are interested, TODAY.

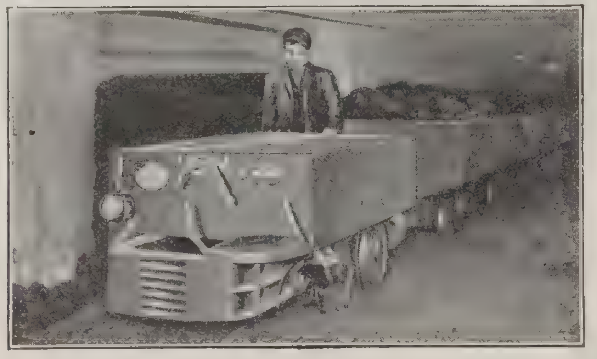
GEO. D. WHITCOMB CO.

Main Office and Works
ROCHELLE, ILL.

Sales Offices
Pittsburgh, Pa. Wilkes-Barre, Pa. Ashland, Ky. Birmingham, Ala.
Denver, Colo. Seattle, Wash

Electric Storage Battery Locomotives

The Coal Mining trade has been looking for a self contained haulage locomotive for gathering work.

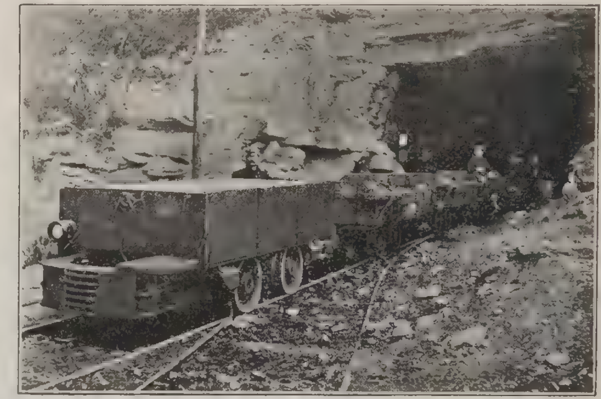


The Storage Battery Locomotive is well adapted for this work as it can be charged at night when there is a surplus of power and is available for use during the day shift without drawing on the power.

A Storage Battery Locomotive does not require trolley line, rail bonds, cables or other equipment to enable it to go to the working faces and gather the cars to the side tracks or switches for the main haulage motors. They are exceptionally useful in the development of a new mine for these reasons: As the power all has to be stored in the batteries they are only adapted for moderately short hauls and a combination of Storage Battery Motors for gathering and Gasoline Locomotives for the main haul makes an ideal combination, as both are independent units free from power plants and transmission lines.

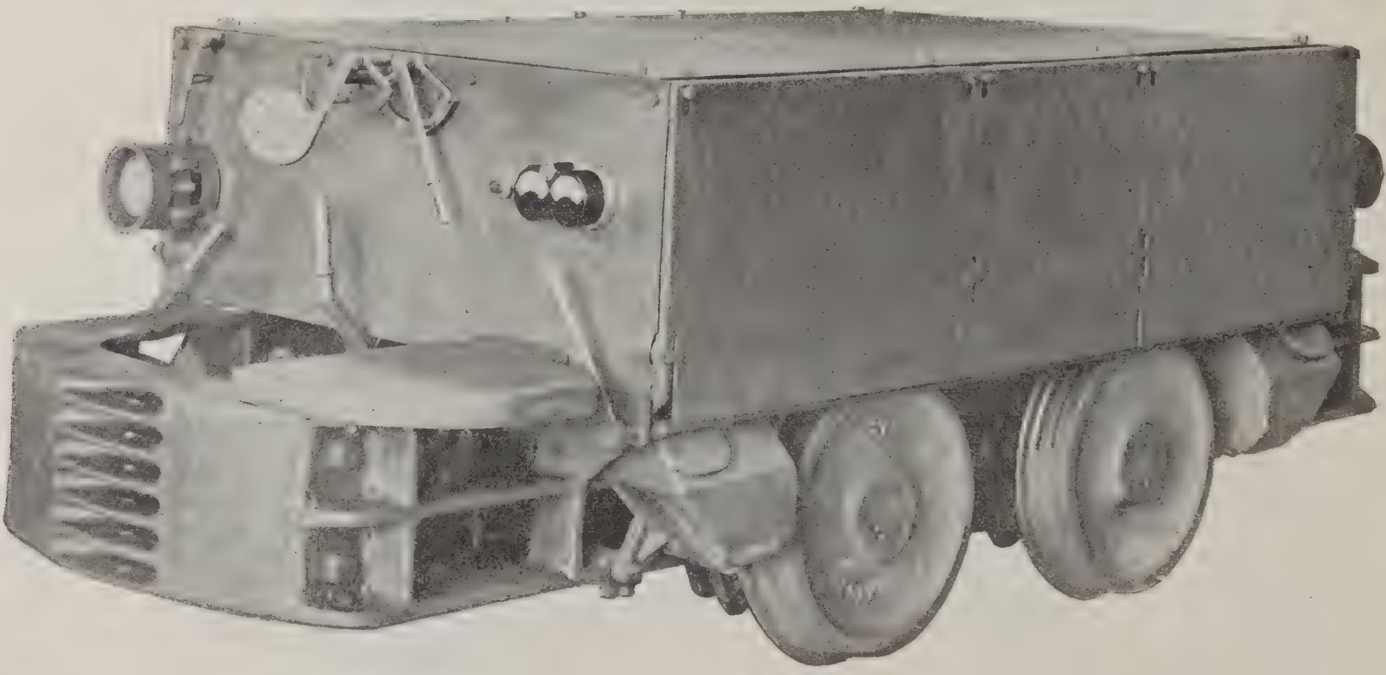
The Whitcomb Electric Storage Battery Locomotives are made in two types—a low type that is 32 inches in height for use in low coals and a higher type that is 42 inches in height for higher coals. The width and length will vary according to battery equipment.

In the installation of Storage Battery Motors it is necessary, to a large extent, to take each installation as a special engineering problem and proportion the battery equipment for the work to be done. Therefore there is no fixed or standard battery equipments.



The Whitcomb Electric Storage Battery Locomotives are built in weights from two tons to seven tons and with Battery equipment designed to give full eight to ten hour service on one charge of the batteries.

Correspondence is solicited and experienced men will be sent to go over conditions and submit full detailed estimates.



Edison Storage Battery Company

Factory and Main Office
232 LAKESIDE AVENUE, ORANGE, N Y

Distributors in

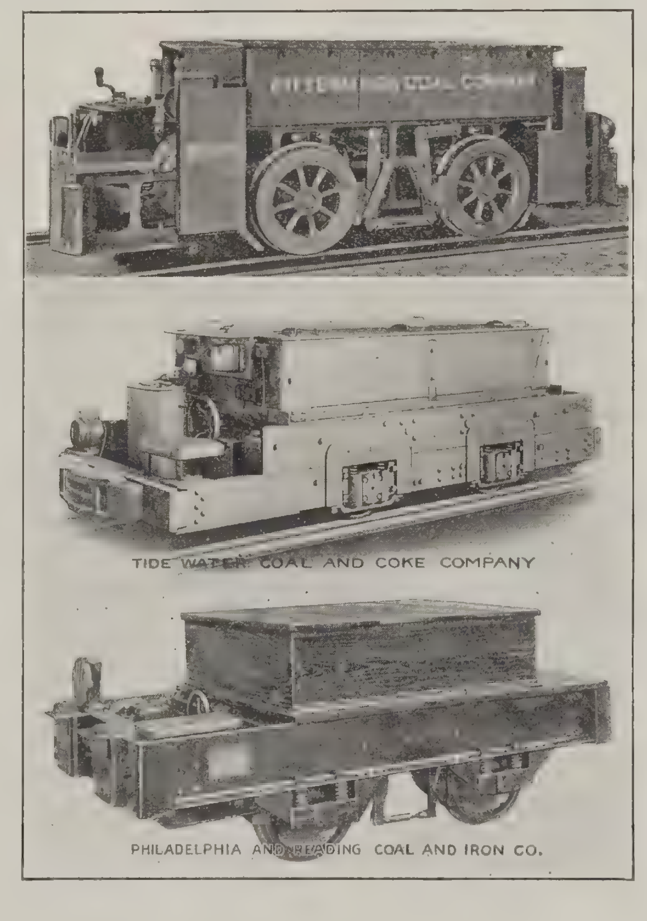
NEW YORK BOSTON CHICAGO DETROIT WASHINGTON SEATTLE
SAN FRANCISCO LOS ANGELES NEW ORLEANS

Storage Battery Locomotives

Are built to withstand the extremely rough service which they must of necessity encounter in mining work. It is, therefore, logical to assume that the storage batteries utilized for supplying the power for these locomotives must be at least as strong, to assure minimum amount of repairs and maximum number of working days.

The Edison Nickel-Iron-Alkaline Storage Battery

Accomplishes this requisite ruggedness by an all steel construction—steel plates, steel poles, steel container—and by securing the active materials—nickel hydrate, positive, and iron oxide, negative—in steel tubes and pockets.



TIDE WATER COAL AND COKE COMPANY

PHILADELPHIA AND READING COAL AND IRON CO.

The electrolyte is a solution of potassium hydrate with a little lithium hydrate. This does not dissolve the active materials, sets up no corrosive action, throws off no noxious fumes, and has a preservative rather than deteriorating effect, on the internal parts of the battery.

Aside from the rubber insulators, every part of the Edison cell is made of high grade steel; every steel part is heavily nickel-plated, and then annealed in the presence of hydrogen gas to prevent chipping or stripping of the nickel.

The plates are assembled in positive and negative groups on nickel-plated steel connector rods, separated by steel washers and locked in permanent position by nuts. The elements are intermeshed and insulated from each other by strips of hard rubber.

The seam up the side of the container, the bottom, and, after complete assembly, the top, are all welded by the oxy-acetylene process, making the container a one-piece product.

The only opening in an Edison cell is a small valve-controlled aperture at the top, through which the distilled water or renewal solution may be added.

The cell connections are made of copper with steel lugs having holes tapered to correspond to the tapered poles. These lugs are held tightly in position by nuts screwed on the tops of the poles and easily attacked or disconnected with a wrench, eliminating all brazing or "lead burning."

The following are exclusive characteristics of the Edison Alkaline Storage Battery, made possible by its nickel-iron-alkaline combination enclosed in steel.

Requires minimum of attention.

Suffers small loss of charge when idle.

Severe vibration and concussion have no effect upon it.

The steel container is unbreakable.

No frequent hydrometer readings are necessary.

The tray assembly and cell connections are simple.

Buckling and growing of plates, sulphation and kindred "diseases" are impossible.

No plate renewals, separator renewals or other repairs are needed.

May stand idle, either charged or discharged, for months at a time without injury and with absolutely no attention.

Gives off no noxious fumes and can be placed in any environment without fear of corroding nearby metal or injuring persons in the neighborhood.

May be put on charge at any time, regardless of how much or how little of the previous charge has been used. Similarly, it may be taken off charge at any time and used, whether fully charged or not.

The Electric Storage Battery Company

General Offices and Works:

Philadelphia, Pa.

PHILADELPHIA
Allegheny Ave. and 19th St.
NEW YORK
100 Broadway.
CHICAGO
Marquette Building.
ATLANTA
Candler Building.
ROCHESTER
184 Clinton Ave., South.

ST. LOUIS
H. B. Marshall,
Soliciting Agent,
1508 Federal Reserve Bank Bldg.

DENVER
G. D. Luther,
Soliciting Agent,
1424 Wazee St.

WASHINGTON
1828 L St., N. W.
BOSTON
60 State St.
CLEVELAND
Citizens Bldg.
PITTSBURGH
Keystone Building.

DETROIT
Hayward Building.
SAN FRANCISCO
George Murphy,
Soliciting Agent,
739-745 Rialto Building.
CANADA
The Canadian Gen'l Elec. Co.,
Ltd., King & Simcoe Sts.,
Toronto.

The "Ironclad=Exide" Battery for Storage Battery Locomotives

The "Ironclad=Exide" Battery, due to its long life, simplicity, durability and reliability is especially adapted for use on storage battery mine locomotives.

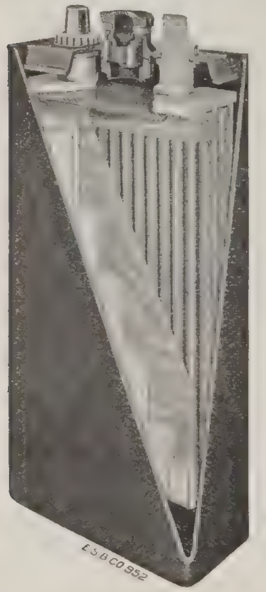


Fig. 1.
"Ironclad=Exide" Cell cut away, showing new cover, filling plug and splash cover.

The "Ironclad=Exide" positive plate is designed to prevent the shedding of active material, thus giving the battery a long life and eliminating the necessity for frequent cleanings.

The workmen, ordinarily employed at the mine can, with very little instruction, give this battery the small amount of care and attention that it requires.

The battery is assembled in special types of trays, with the cells securely blocked in place, thoroughly insulating the battery from the frame of the locomotive and in such a way that it is well adapted to with-stand the severe jaring incident to frequent couplings and rough track.

The "Ironclad=Exide" Battery can be depended upon for continuous every day service as it does not require any special care or cleaning treatment which necessitates its being periodically taken out of service.

The "Ironclad=Exide" Battery has been recently improved by the addition of an air tight cover and filling plug construction. It is the only battery that offers the following advantages.

1. It absolutely prevents dust or other impurities from getting into a cell.
2. The cover is flush with the top of the jar leaving no space for the collection of moisture or dust.
3. It limits the amount of water that can be put into a cell to the exact amount needed to replace that lost by evaporation.
4. It keeps the battery dry, overcoming slopping and spilling of electrolyte and thus eliminating short circuiting, rotting of battery trays and corrosion of metal parts.
5. The filling plug can be loosened and removed or replaced and tightened by only a quarter turn.

The illustrations fully explain the contruction of this new type of cover and filling plug.

Figure 2 shows an air lock (A) in a position which closes air passages (BB). In this position it is impossible to overfill the cell as (CC) becomes an air tight chamber as soon as the water rises to the proper level. Any excess poured in merely rises in the neck (D), giving a positive indication that sufficient water has been added. Should, however, the filling be continued, the excess will be pure water only—not electrolyte. Removing and replacing the plug (E) automatically changes the position of the air lock (A).

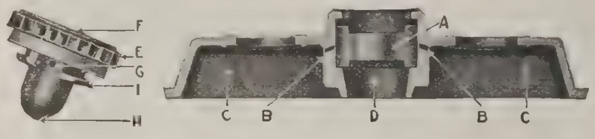


Fig. 2.
Cross Section of Cover, Vent Plug Removed.

Figure 3 shows the plug (E) in place with the air lock (A) in position to allow free ventilation through passages (BB) and thence through vents (FGH) in plug (E).

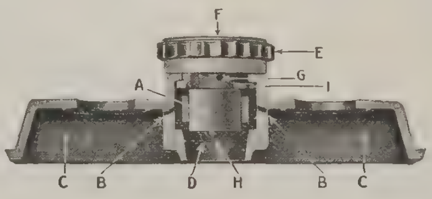


Fig. 3.
Cross Section of Cover, Vent Plug in Place.

The big, sturdy, interrupted thread (I) overcomes any possibility of threads getting crossed or of plugs sticking and breaking. The filling neck (D) is large, making it easy to pour in water without spilling.

The "Ironclad=Exide" Battery has been very extensively used by the Atlas Car & Manufacturing Co. of Cleveland, Ohio; the General Electric Co., of Schenectady, N. Y.; the Jeffrey Manufacturing Co. of Columbus, Ohio; and the Westinghouse Electric & Manufacturing Co., of Pittsburgh, Pa., all of whom are manufacturers of storage battery locomotives for mine service.

Special bulletins and catalogues on the "Ironclad=Exide" Battery can be secured from the nearest Sales Office of the Company.

GOULD STORAGE BATTERY CO.

General Offices, 30 E. 42nd St., New York
Works, Depew, N. Y.

Philadelphia, 613 Lincoln Building.
Cleveland, 1765 E. 18th Street.
Detroit, 100 Beaubien Street.

Chicago, 225 East 22nd Street.
Los Angeles, 118 East Pico Street.
San Francisco, 1448 Van Ness Avenue.

Canadian Representative: R. E. T. Pringle, Toronto, Montreal, Winnipeg, Vancouver.

Gould STORAGE BATTERY

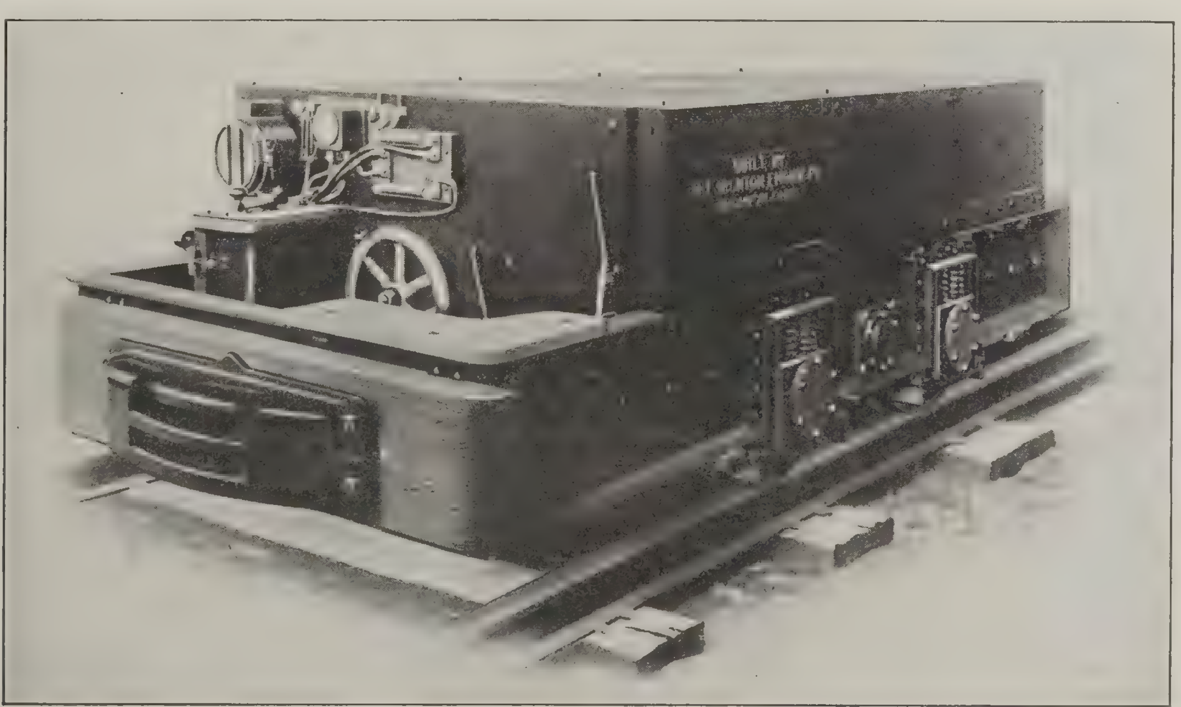
Expressly Designed for Mine Locomotive Service

"What is its record?" That is apt to be the first question in considering the merits of a storage battery for mine locomotive use. It is a fact that nearly every Gould Locomotive Battery is bought on its record and the endorsement of "the mine that owns one." We are always pleased to refer inquirers to users of Gould Locomotive Batteries in their vicinity.

The Gould Locomotive Battery is not an adaption but a specifically designed battery built to withstand the severe usage unavoidable in mine haulage. When the unique value of the storage battery locomotive was first demonstrated several years ago, we realized that its efficiency and dependability rested largely on the battery. With years of experience in building submarine, street railway, railroad car-lighting and stationary plant batteries to guide us, the Gould Mine Locomotive Battery was perfected and proved a success from the start. Today we offer you at a moderate price a locomotive battery that is not an experiment but a thoroughly-proven success.

Gould Super-Hard Plates and rugged Gould construction are responsible for the steadily-maintained voltage, long life and economy of upkeep demonstrated by the actual records in numerous installations.

Our engineers will confer with you at any time without placing you under any obligation.



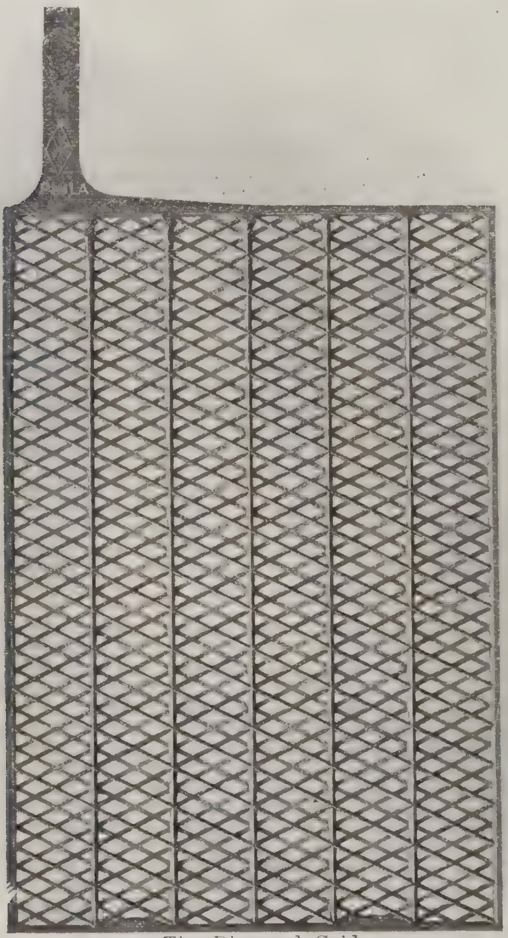
Philadelphia Storage Battery Company

General Offices and Factory
ONTARIO & C STS. PHILADELPHIA, PA.
BRANCH OFFICES IN ALL LARGE CITIES

Manufacturers of

Philadelphia Diamond Grid Continuous Service Storage Batteries for Electric Locomotives

The prime requisite for satisfactory results in an electric locomotive storage battery is ability to deliver CONTINUOUS SERVICE. The Philadelphia "DIAMOND GRID" Storage Battery by virtue of several exclusive features of design **does** deliver continuous service.



The Diamond Grid

1. All Philadelphia plates are built upon the patented "DIAMOND GRID." As shown in the illustration the "DIAMOND GRID" consists of members arranged similarly to the members of the familiar bridge truss. This construction is used so universally by engineers, where great mechanical strength is desired, that no argument is necessary to demonstrate its desirability in a storage battery grid. The "DIAMOND GRID" will not break, will not buckle, will not short circuit.

2. The plates in Philadelphia "DIAMOND GRID" Batteries are separated by patented Diamond hardwood separators. A battery is no better than its separators. If the separators are of soft, short-lived wood, or if they are too thin, they will sooner or later break down, allow short circuits to form and cause either total or partial deterioration of the plates. In any case the battery must be removed from service and dismantled. Philadelphia Diamond separators are constructed of hard wood of liberal thickness and have a life longer than that of the plates. Philadelphia "DIAMOND GRID" Batteries need never be dismantled for renewal of the separators.

3. Philadelphia "DIAMOND GRID" Batteries are assembled in jars with sufficient space beneath the plates to accomodate all of the sediment deposited during the entire life of the battery. It is never necessary to dismantle a Philadelphia Battery to remove sediment.

4. The containing jars have thick walls of tough strong compound. Every jar before being put into service is tested electrically for insulating properties. The jars cannot corrode, cannot ground, and with the battery properly mounted are practically unbreakable.

The capacity of the usual "DIAMOND GRID" Locomotive Battery, Type WI, is as great or greater than the capacity of the ordinary locomotive battery, nevertheless still greater capacity may easily be obtained when desired by using Type WMI or WTXI. For instance a 48—21 WI will deliver 315 ampere hours. A 48—25 WMI will fit the same space and deliver 360 ampere hours. A 48—33 WTXI will deliver 408 ampere hours. Unusual requirements can thus be easily met or the original equipment can be converted into a higher capacity equipment by renewing with one of the higher capacity types.

Philadelphia "DIAMOND GRID" Batteries have been used for years, as standard equipment, by the leading manufacturers of electric pleasure and commercial vehicles. They have successfully met every service demand, from the lightest electric pleasure vehicle to the heaviest commercial vehicle. For day in and day out service, and for the lowest cost per mile and per day, the Philadelphia "DIAMOND GRID" Battery stands pre-eminent. We shall be pleased to recommend to you, without any obligation on your part, the type and size of Philadelphia Battery best adapted to meet the requirements of your service.

PENNSYLVANIA CASTING & MACHINE WORKS

PITTSBURGH, PA.

Manufacturers

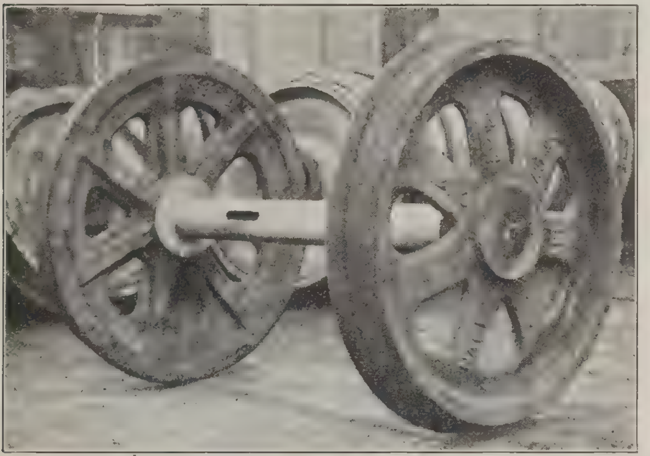
Wheels of Every Description

Products

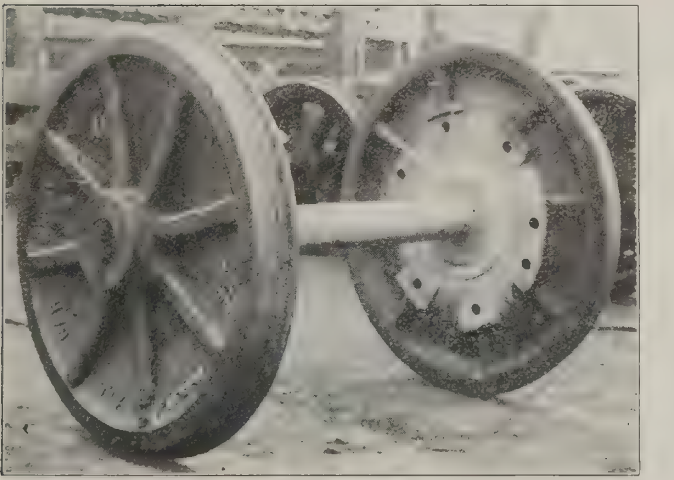
Wheels of every description for mining locomotives, dump cars and standard M. C. B. freight cars.

Our Facilities

We carry in stock at all times wheels and axles for all types and makes of mining locomotives, thus insuring you quick delivery. We also specialize in mounting new wheels on either old or new axles.



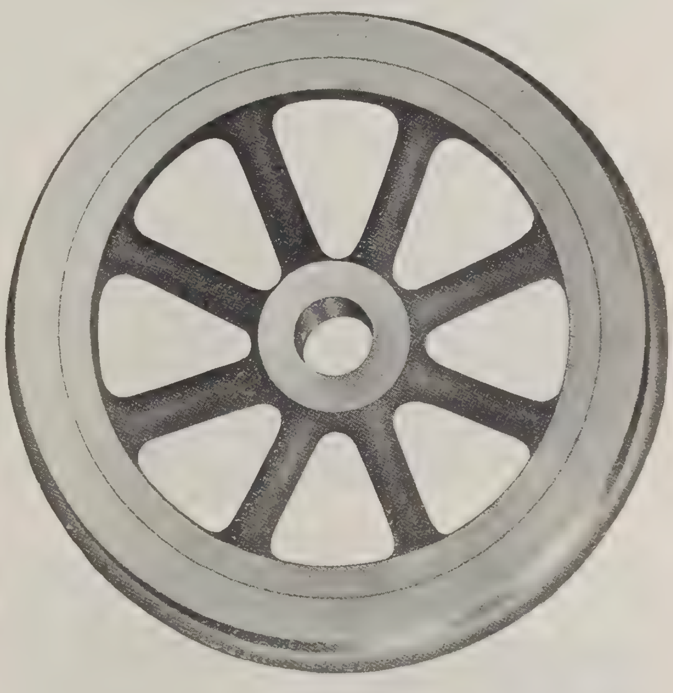
Baldwin, Westinghouse, Jeffrey, Morgan-Gardner Locomotive Wheels.

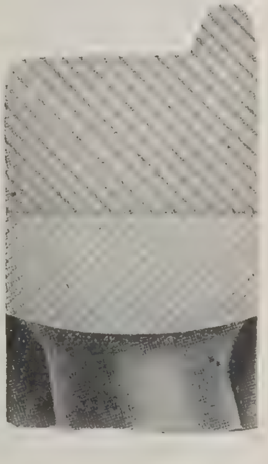


Goodman Locomotive Wheels.

Steel Tired Wheels

We supply steel tired wheels complete, or can furnish steel tires properly machined for your refitting to old centers.





Write Us for Particulars.

H. K. PORTER COMPANY

1200 Union Bank Building

PITTSBURGH, PA.

BUILDERS OF

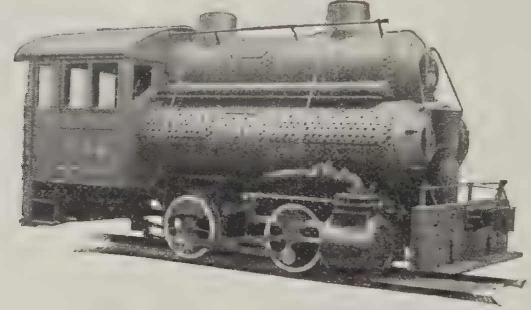
Steam and Compressed Air Locomotives

Products

Steam Locomotives, light and heavy, narrow and wide gauges; Fireless Steam Locomotives; Compressed Air Locomotives, and Haulage Plants.

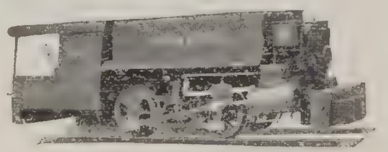
Porter Air Haulage for Underground or Surface by utilizing the heat of the surrounding atmosphere—whether zero or tropic weather—gets 50 per cent more work out of the same quantity of air without a cent of additional cost—it is "free as air." This cuts down cost of compressor and storage pipe-line and cost of operating and has put old style single expansion haulage out of competition. The Porter patents have been sustained by the court of final appeal.

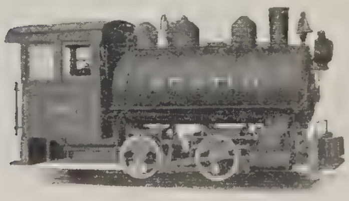
Two-Stage Compressed Air for Main Entry.


Two-Stage Air for Long Haul Outside Work.

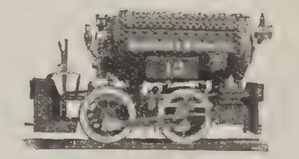
Fireless Stored Steam.

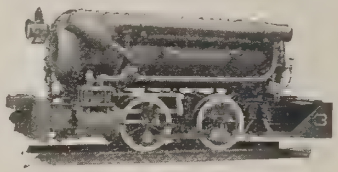
Air Haulage is **free from fire risk** — no sparks — no live wires—no gas, smoke or fumes—no short circuits—improves ventilation—easy to operate—economical because **power produced evenly and constantly and** used as required.


Steam, Mine or Mill.


Contractor's "Dinkey"—Narrow or Wide Gauge.

Let us make estimate on plant complete designed to meet your conditions with highest efficiency and greatest economy. It will cost you nothing and save in money and safety. **Catalogue (a complete air textbook) on request.**


Two-Stage Air to Go In Mine Cage.


Two-Stage Air for Gathering.

Porter Steam and Fireless Locomotives

ELEVENTH EDITION STEAM CATALOGUE, 152 pages, 8 x 11, describing 673 sizes and designs, "the best locomotive catalogue ever printed," with engineering data, metric tables and information not elsewhere in print, free to intending purchaser, user, or to others at nominal price of $1.00.

Six-Wheel Connected with Saddle-Tank.

30 steam locomotives—24, 36 and 56½ inch gauges, various designs, light and heavy sizes, always in stock completely finished, or for extra quick shipment.

All locomotives to duplicate system and spare parts always in stock ready to ship—a practical customers' accident insurance.

Six-Wheel Connected with Tender—Shifter and Industrial.

VULCAN IRON WORKS

WILKES-BARRE, PA.
NEW YORK CHICAGO

Vulcan Steam, Gasoline and Air Locomotives; Steam and Electric Hoists; Mine Ventilating Fans

Products
See Page 312.

Vulcan Mine Locomotives

They are divided into the three general classes, individually discussed below.

Of the three classes, the steam locomotives are by far the oldest. Compressed air locomotives follow, and those propelled by gasoline motors are a much newer development. All types of Vulcan locomotives are used in mining operations in great numbers. They are used throughout the world, and have acquired reputations for low operating costs, low maintenance and longevity.

Steam Locomotives

For mine service they are usually of the 0-4-0 or 0-6-0 types—more generally the former. Many VULCANS have been built for inside mine service with very small drivers and extremely low clearance overhead. Most of these were built to clear the height of the average mine trolley wire with ease.

For outside mine service VULCAN Steam Locomotives are valuable particularly for their absolute reliability, independence from outside power sources, large radius of action, and extremely low fuel and water consumption per ton-mile.

Gasoline Locomotives

The basic principles—the time tried and successful features—of VULCAN Steam Locomotives are retained in VULCAN Gasoline Locomotives to as great an extent as possible. This is especially noticeable in double-bar frames, pedestal jaws, driving boxes, wheels and connecting rods. A four-cylinder opposed motor is used. Transmission through two multiple-disc clutches and gears to rear drivers. These locomotives are adapted for gathering.

Compressed Air Locomotives

The advantages of these machines, especially in the dangerous portions of mines, are too well known to require emphasis.

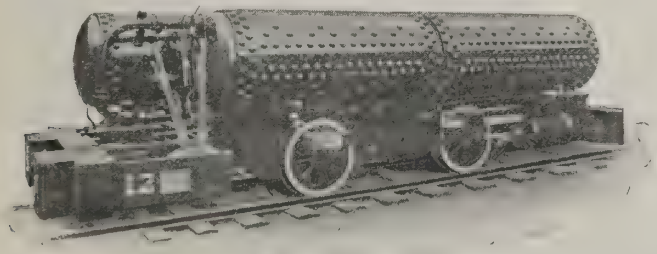
The Vulcan machines follow steam locomotive practice very closely. They are made in both the 040 and 060 types. The only difference from steam locomotive practice lies in the cooling fins cast on the cylinders and changes in proportions to create utmost efficiency under air as a propelling force.

Tanks can be supplied in the form of a single unit or in batteries for any desired pressure.

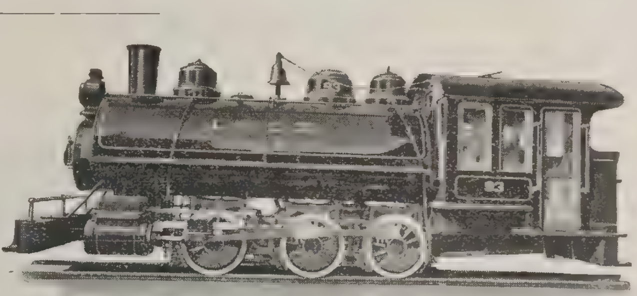
Locomotives In Stock; Repair Parts

6-by-10 to 14-by-20 locomotives, in both standard and three feet gauges, are generally in stock for immediate shipment. The designs of these locomotives cover most mining needs, but where conditions require special treatment and immediate delivery is unnecessary, we advise consultation with our engineers before deciding upon any specific design.

Repair parts of all VULCAN standard stock locomotives are on hand at Wilkes-Barre for immediate shipment. They are all made to gauge and template and are guaranteed to fit the proper locomotive class perfectly.



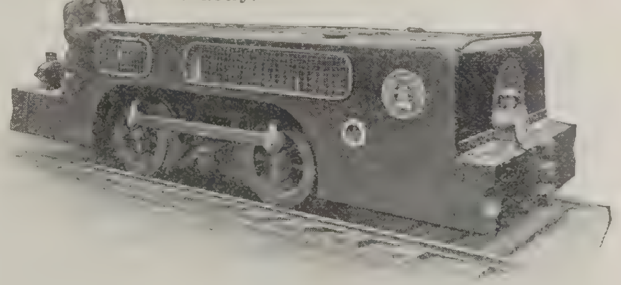
Hundreds of Vulcan Compressed Air Locomotives have been in successful service for years. Besides being absolutely safe in inflammable atmosphere, they add to ventilation. Exceptionally great air storage capacity.



These 0-6-0 engines are intended for outside mine service. Coal and water capacity is large; wheel base short enough for sharp curves; equalizing system makes them easy riding. They develop a high tractive effort, because all the weight is on the drivers.

Some Vulcans are even smaller than this. These little, low-clearance fellows are built to the same rigid specifications as the larger ones. They are exceptionally economical and very powerful.

0-4-0 engines of this general type, with saddle-tank, are the best all-around engines you can buy. We have countless designs made for special conditions. Undoubtedly one of these will fit your case exactly.



The four cylinder opposed motor is very powerful. Ignition and carburetion are extremely simple and absolutely reliable. Sizes from six to fifteen tons, with tractive effort equal to equivalent steam locomotives.

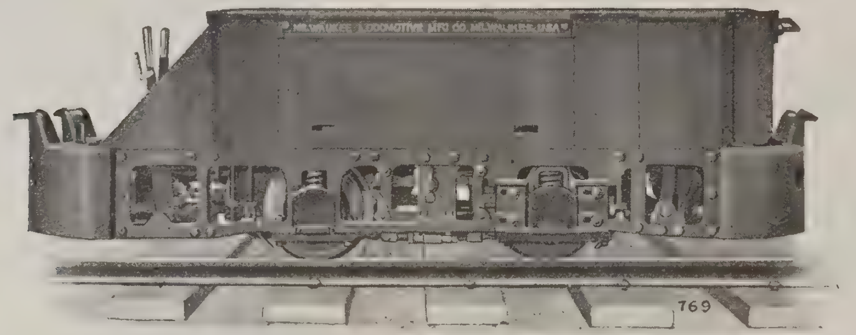
MILWAUKEE LOCOMOTIVE MFG. CO.

General Office and Works
MILWAUKEE, WISCONSIN

PITTSBURGH, PA.
307-309 Westinghouse Bldg.

KNOXVILLE, TENN.
1005 Bank & Trust Bldg.

Milwaukee Gasoline Locomotives



Type L-25, 5-ton Bar Steel Frame Locomotive. Inside Wheels—Track Gauges 24″ to 34″—Length 144″—Width 50″ to 54″—Height 46″.

Milwaukee Gasoline Locomotives

Are designed for Mine Service, where the requirements demand the constant and economical transportation of the output with regularity and dispatch, and where service requirements demand an equipment of the highest efficiency, absolute reliability and of extreme rugged construction.

For mine haulage where the haulage costs are one of the chief items of expense, and where the cost of production depends largely upon the cost of haulage, Milwaukee Gasoline Locomotives will be found far more efficient and economical than any other form of haulage. Their compact and rugged construction, great flexibility, and low cost of operation and maintenance, have made them important factors in the mining field, where they are now being extensively used by many of the largest coal and metal mine operators.

Type "L" Locomotives

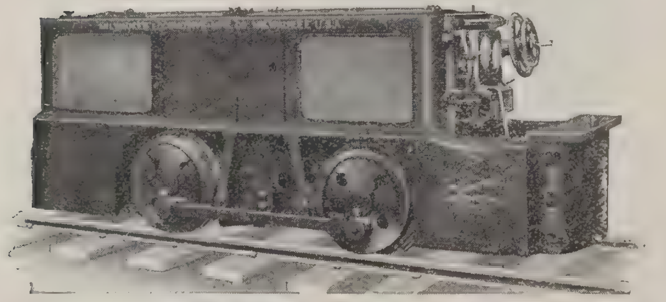
Are our most improved type and embody all the latest features in locomotive design and construction. These locomotives have frames of the open bar steel type and are equipped with powerful 4 cylinder, 4 cycle vertical engines, especially designed for locomotive service. Built in 5 ton, 6 ton and 8 ton sizes, for all gauges of track, with speed combinations of 3½ and 7 miles, and 4 and 8 miles per hour, both forward and backward, and furnished with electric lighting equipment. Electric starting equipment also furnished with 8 ton locomotives.

Type "M" Locomotives

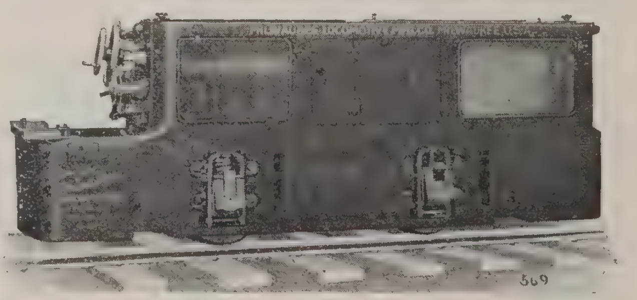
Have cast steel end sills, cast iron side frames, transmissions of the double cone type, steel tired wheels and are equipped with 4 cylinder, 4 cycle vertical engines.

Type M locomotives are built in 4½ ton, 5 ton, 7 ton and 9½ ton sizes, for all gauges of track and are designed for two speeds of 4 and 8 miles per hour, both forward and backward. These locomotives are regularly furnished with oil head and tail lights but can be furnished with electric or carbide lighting equipment, when specified.

Write for catalogs.



M-35. 7-ton—Outside Wheels—Track Gauges 35″ to 56½″. Length 140″—Width 48″ to 70″—Height 49″.



M-35. 7-ton—Inside Wheels—Track Gauges 18″ to 32″—Length 140″—Width 47″ to 56″—Height 49″.

GEO. D. WHITCOMB CO.

Main Office and Works
ROCHELLE, ILL.
Sales Offices
Pittsburgh, Pa. Wilkes-Barre, Pa. Ashland, Ky. Birmingham, Ala.
Denver, Colo. Seattle, Wash.

Gasoline Locomotives

Whitcomb Gasoline Locomotives have been in use in the United States in practical every day use since the Spring of 1910 and at the present time there are several hundred Locomotives in use. They are in service in Coal Mines, Limestone Mines and Quarries, Lead and Zinc Mines, Iron Mines and around industrial plants and can be used in any service where a self contained haulage Locomotive, free from dirt and smoke is desired.

In under ground work some provision has to be made for ventilation, but this is easy to provide.

The Whitcomb Gasoline Locomotive is driven by four cylinder four cycle heavy medium speed engines. The light automobile type of engine is not used.

The drive is by means of heavy roller chains, a double drive from jack shaft to front axle, and a single drive from front to rear axle making all four wheel drive wheels—thereby gaining the greatest tractive effort.

The cooling is secured by spraying the water into two cast iron cooling boxes and driving air through the spray by means of a Sirrocco Type Fan. The air coming in direct contact with the water giving highest efficiency. These boxes are easily cleaned and are not liable to injury like an automobile type radiator.

Transmission provides for two speeds in either direction, and the locomotive operates equally well in either direction. Ordinarily the low speed is four miles per hour and the high speed is eight miles per hour with the engine running at normal speed. The engine can be run both above and below normal speed therefore a range of speed from two miles to ten miles per hour is available.

The Whitcomb Gasoline Locomotive is built with wheels inside or outside of frame—with or without cabs—for all gauges of track from 18″ to 56½″, and in sizes from 2½ tons up to 16 tons in weight.

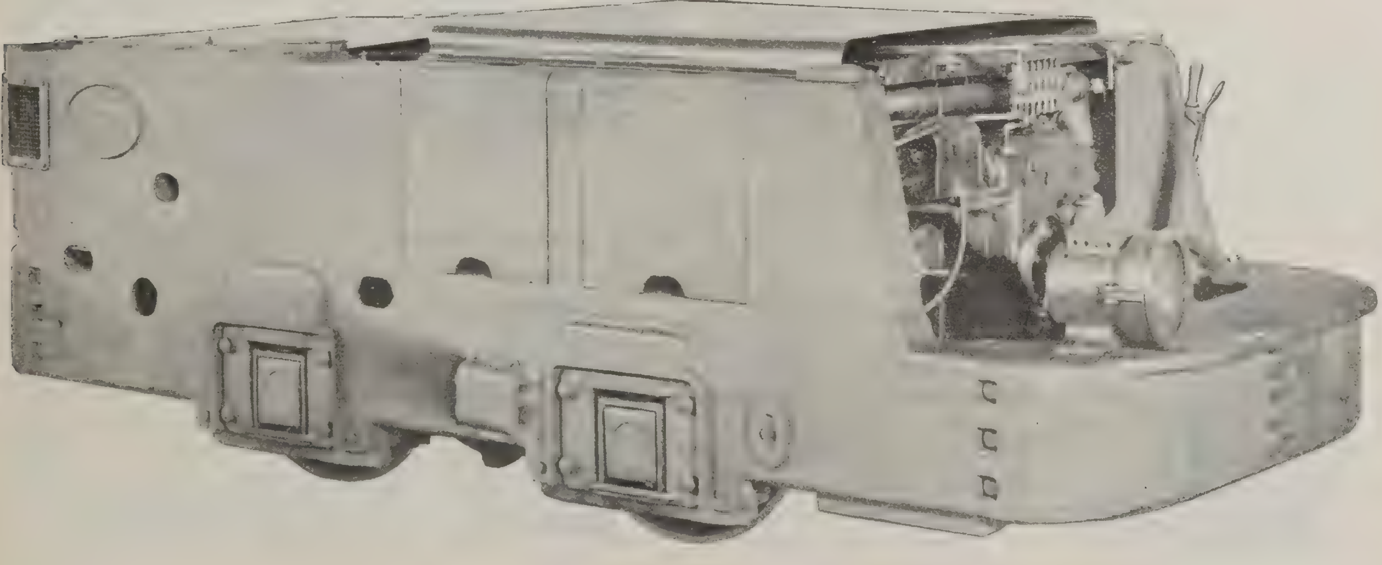
The locomotives will exert a tractive effort in starting equal to about 25% of the weight of the locomotive and will develope a constant draw bar pull on the level when working in low gear equal to 20% of the weight of the locomotive.

Based on a draw bar pull of 20% of the weight of the locomotive on the level, the hauling capacity in tons of 2000 lbs. per ton of weight of locomotive is as follows:

Rolling Friction or Resistance of Cars Per Ton Gross Weight on the Level.

	15lb	20lb	25lb	30lb	35lb	40lb
On Level	26.6	20.	16.	13.3	11.4	10.
Against ½ of 1% Grade	15.6	13.	11.1	9.7	8.7	7.8
“ 1% “	10.8	9.5	8.4	7.6	6.9	6.
“ 1½% “	8.2	7.4	6.7	6.1	5.7	5.3
“ 2% “	6.5	6.	5.5	5.1	4.8	4.5
“ 2½% “	5.4	5.	4.6	4.4	4.1	3.9
“ 3% “	4.5	4.2	4.	3.8	3.6	3.4
“ 3½% “	3.9	3.7	3.5	3.3	3.1	3.
“ 4% “	3.3	3.2	3.	2.9	2.8	2.6
“ 4½% “	2.9	2.8	2.7	2.6	2.5	2.4
“ 5% “	2.6	2.5	2.4	2.3	2.2	2.1

Full estimates of cost of installation and operation will be submitted on request.



CROUSE-HINDS COMPANY

SYRACUSE, N. Y., U. S. A.

NEW YORK
30 Church St.

BOSTON
201 Devonshire St.

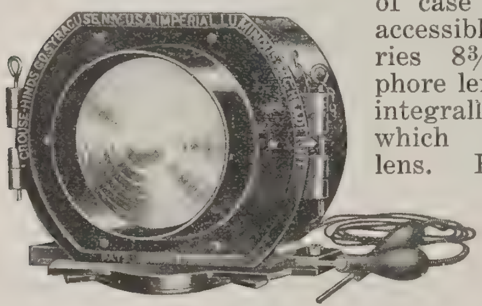
CINCINNATI
1-7 Fourth St., W.

CHICAGO
417 S. Dearborn St.

Manufacturers of Electrical Appliances, Including

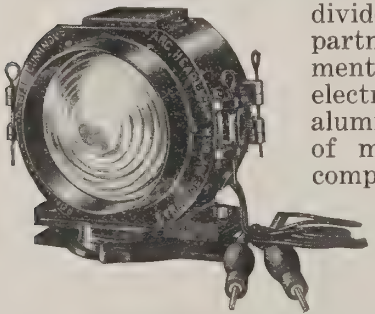
Incandescent and Arc Mine Headlights

Type MLF, With Turrett Base


Type MLF.

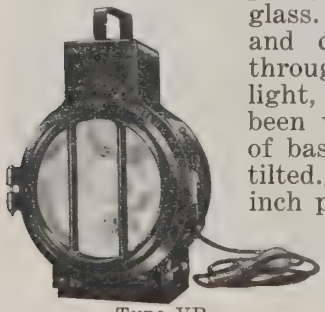
Has long-burning electrodes and extra strong cast iron case. Mechanism is mounted on interior of case and is easily accessible. Door carries 8⅜-inch semaphore lens and has an integrally cast collar which protects the lens. Height, 12¼ inches; width, 15 inches; depth, 9¼ inches, Headlight is also furnished with stationary base.

Type MLK, With Turret Base


Type MLK.

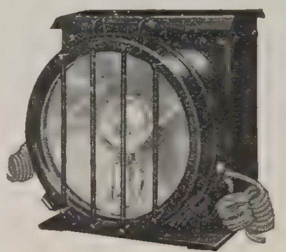
Has long-burning electrodes and extra strong cast iron case with front and back hinged doors. A diaphragm, cast with case, divides latter into two compartments. Front compartment contains electrodes, electrode holders and small aluminum reflector. Rest of mechanism is in rear compartment, free from fumes and deposits of burning electrodes. Front door carries 7⅜-inch semaphone lens and an integrally cast collar which protects the lens. Height, 10¾ inches; width, 12⅜inches; depth, 7⅝ inches. Headlight is also furnished with stationary base.

Type VR, With Rocker Base


Type VR.

Burns carbon electrodes. Has extra strong cast iron case. Two grids, case with door, protect glass. Mechanism is simple and carbons can be renewed through hole in bottom of headlight, after connecting bolt has been withdrawn from one side of base and headlight has been tilted. Equipment includes 8-inch paraboloidal, aluminum reflector. Height, 12¾ inches; width 10½ inches; depth, 6⅛ inches.

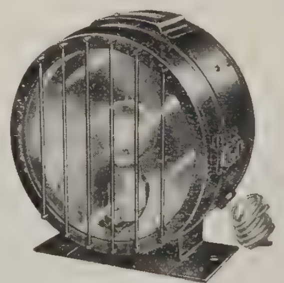
Type MD-Incandescent With Self-Contained Resistance


Type MD.

Has pressed steel case, nickel plated copper reflector 6½ inches in diameter, bayonet point socket, at bottom, for 24-volt, 25-watt G16½ lamp, and door with glass-protecting grids. Door hinges at top and is tightly locked by two lever catches on lower edge of frame. Resistance consists of seven tubes independently mounted in resistance compartment. Liberal carrying capacity is provided in the winding of the tubes, and the resistance is, in consequence, highly dependable.

Headlight is as small as it is practical for a headlight with a self-contained resistance to be made. Height, 9 inches; depth, including resistance, 7⅛ inches; width, 8 inches. Bolts rigidly to locomotive.

Type MC—Incandescent.


Type MC.

Has pressed steel case, door with grids to protect glass; a 9⅝-inch nickel plated or glass reflector, and adjustable socket, at bottom, to take any concentrated filament Mazda lamp, 23 to 94-watt, or any lamp of G25 bulb size or smaller. Door hinges at side and is held closed by lever catch. Height, 12¼ inches; depth, 6¾ inches; width, 12 inches; Bolts rigidly to locomotive.

Type I—Incandescent

Type I.

Has extra strong cast iron case. Two grids, cast with door, protect glass. Reflector is polished aluminum. Receptacle, mounted at top, will be adjusted to any concentrated filament Mazda lamp specified, from 23 to 94 watts. Height, 9½ inches; width, 9¼ inches; depth, 6 inches. Bolts rigidly to locomotive.

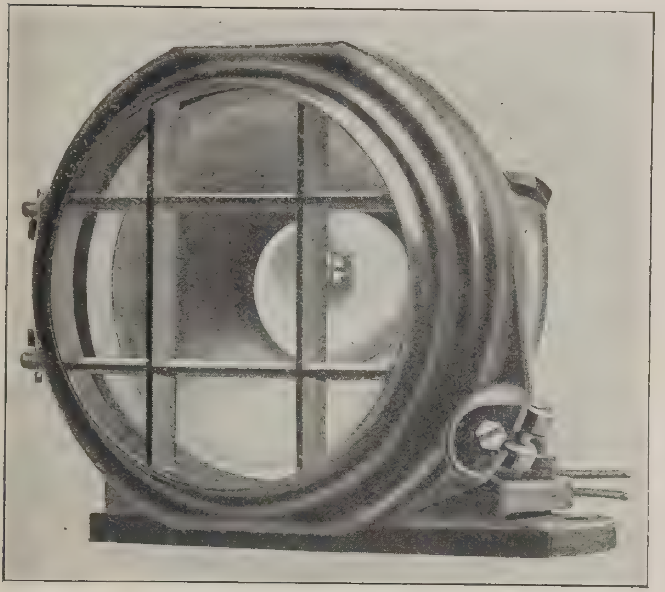
GENERAL ELECTRIC COMPANY

General Office:
Schenectady, N Y

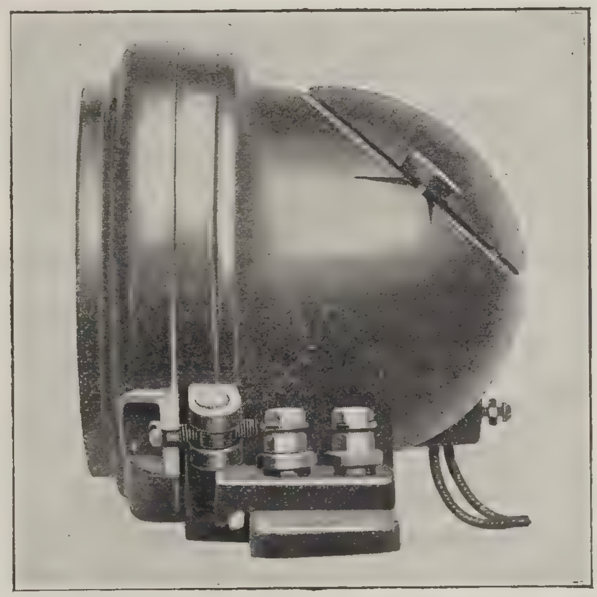
The Guarantee on Goods of Excellence Electrical

Sales Offices
In All Large Cities

Mine Locomotive Headlights



Form H-2 Mining Type Headlight (Front View).



Form H-2 Mining Type Headlight (Side View).

The H-2 incandescent headlight, for mine use, possesses many novel features of construction. It is supported on the base plate by spiral springs which minimize jarring and pounding, thereby prolonging the life of the incandescent lamp filament.

The heavy cast iron casing is made of such a contour that material falling on it will tend to strike a glancing blow.

The headlight is equipped with a ball and socket focussing mechanism which permits the lamp to be moved in any direction to facilitate accurate focussing. The focussing mechanism is readily accessible through a handhole at the top of the casing. The cover for this hole rests on a gasket.

The door is fitted with ¼ in. plate glass and is recessed and protected with a guard to prevent breakage. The door pane is also cushioned with felt.

An 8 in. (diameter), parabolic reflector is used.

The H-2 headlight is practically moistureproof.

When used with the 94-watt lamp the "Pickup" distance is from 500 to 600 ft.; for short hauls, lamps of lower wattage can be used.

In addition to this incandescent headlight the General Electric Company manufactures a complete line of Luminous Arc Headlights for mine use. Our specialists will gladly co-operate to determine the type best adapted to your individual requirements.

The Hess-Bright Manufacturing Company

Front Street and Erie Avenue
PHILADELPHIA, PA.

HESS-BRIGHT BALL BEARINGS

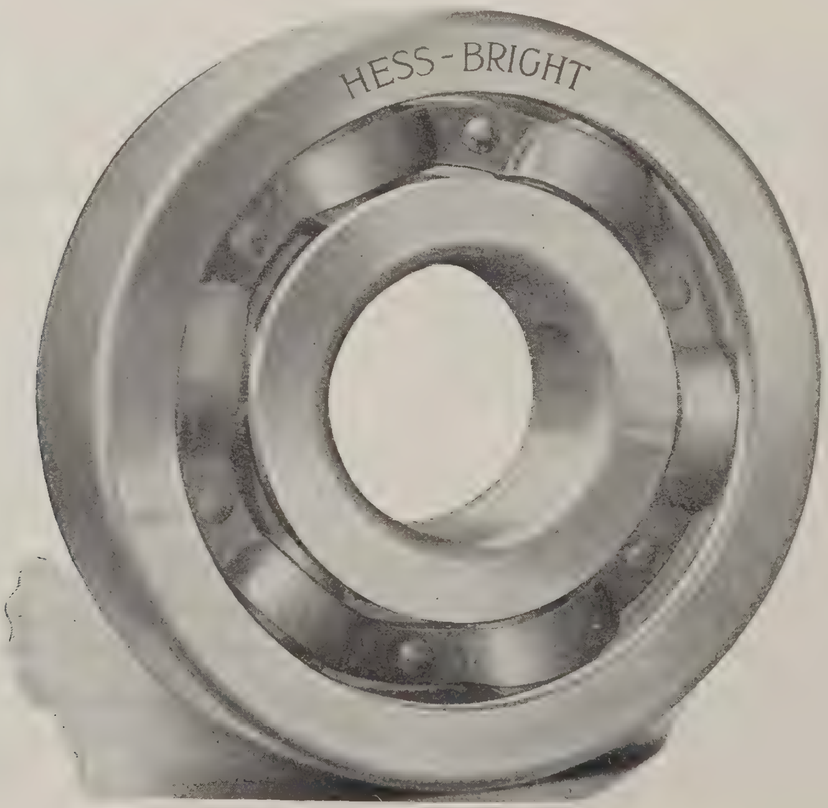
We do not hesitate to admit that HESS-BRIGHT Ball Bearings are the highest priced ball bearings used on mining locomotives.

We do not hesitate, because we feel that the higher price is justified by the superiority of the bearing—superiority proven by service.

We feel that it is a tribute and an achievement for a bearing to sell extensively in every field, and to be used exclusively by many concerns in the face of this higher price.

Hess-Bright Bearings have been tested out more thoroughly in mine service than any other bearings; their success in maintaining the air gap on armature shafts constant through years of hard service is remarkable.

We ask mine motor buyers to consider that when buying locomotives they may have this superior bearing on their machines **Simply by Specifying "Hess-Brights" to the Manufacturer.**



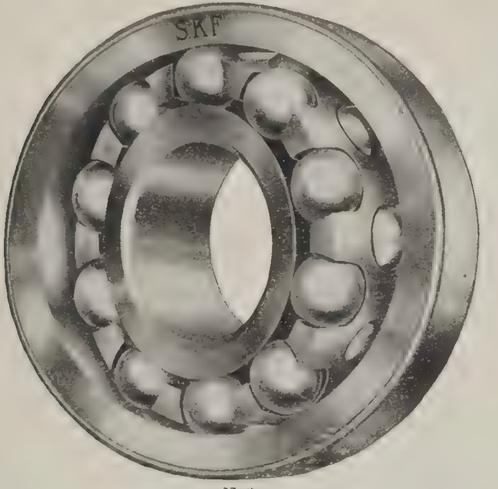
SKF BALL BEARING CO.

HARTFORD, CONN.

Ball Bearings for Mining Locomotives and Machinery

Products

We manufacture S K F ball bearings for mining locomotives, coal cutting machinery, mine cars, mine fans, etc.



F-3

S K F Self-aligning, Double Row Ball Bearing.

Application of S K F Ball Bearings to Mining Locomotive Motors.

The distinctive advantages of this ball bearing application are as follows:

The Armature Cannot Drop Onto Pole Pieces

by reason of the fact that S K F Ball Bearings, after long service show no measurable wear; they therefore maintain the original armature air gaps. This eliminates the necessity of rewinding the armature, renewing the shaft, and obviates other losses incidental to having the entire locomotive out of commission as a result of the dropping of the armature.

Durability is Obtained

because rolling is substituted for rubbing friction. Bearing surfaces, being of the highest grade of Swedish steel, eliminate the uncertain wearing quality of plain bearings.

A Much Higher Carrying Capacity

and greater ability to accept heavy shocks, caused by quick starting of the motors, are to be found in S K F Ball Bearings. A double row of balls, staggered in the raceways, gives the best possible and most uniform distribution of the load, with a high safety factor.

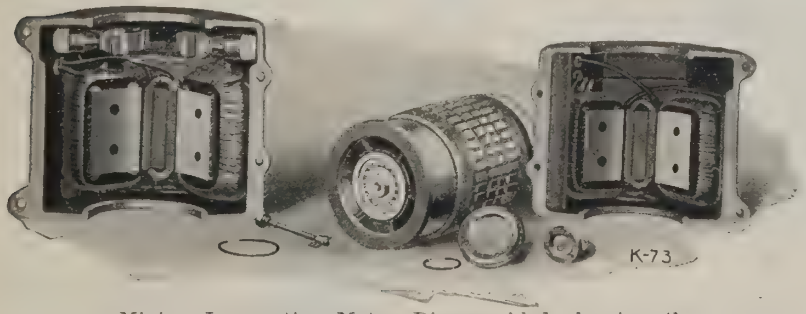
Self Alignment

in S K F Ball Bearings is a distinctive feature which renders them more readily applied and which, in addition to this, allows the bearings to yield to any sudden impulses caused by shock in the driving gear.

Ample Provision for Lubrication

is accomplished by using large lubricating chambers.

Actual experience has demonstrated that the bearing requires lubrication at infrequent intervals. The lubricant chambers are carefully sealed against the leakage of lubricant, there being on either side of the bearing, sealing grooves which fit close to the shaft and prevent the leakage of lubricant from around the bearing, either along the shaft into the pinion casing or onto the opposite side into the armature or field windings.



Mining Locomotive Motor Disassembled showing the S K F Ball Bearings.

R. D. NUTTALL COMPANY,

PITTSBURGH, PA.

MANUFACTURERS OF
NUTTALL PRODUCTS FOR MINING MACHINERY.

Distributors of Nuttall Products

Geo. E. Watts, 1526 Candler Bldg., Atlanta, Ga.
Chas. N. Wood Co., 79 Milk St., Boston, Mass.
Westinghouse E. & M. Co., Lewisohn Bldg., Butte, Mont.
Westinghouse E. & M. Co., 39 So. La Salle St., Chicago, Ill.
Monroe Brass & Wire Co., Traction Bldg., Cincinnati, O.
Westinghouse E. & M. Co., 418 Main St., Dallas, Texas.
Westinghouse E. & M. Co., 429 17th St., Denver, Colo.
Westinghouse E. & M. Co., 1012 Baltimore Ave., Kansas City, Mo.
I. N. Van Nays, 7th & Spring Sts., Los Angeles, Ca.
Electric Service Supplies Co., 17th and Cambria Sts., Philadelphia, Pa.
Union Electric Co., Terminal Warehouses, Pittsburgh, Pa.
Westinghouse E. & M. Co.. Nat. Bank Commerce Bldg., St. Louis, Mo.
Westinghouse E. & M. Co., 212 S. W. Temple St., Salt Lake City.
Westinghouse E. & M. Co., Electric Bldg., 165 Second Ave., San Francisco, Cal.
Westinghouee E. & M. Co., Alaska Bldg., 2nd & Cherry Aves., Seattle, Wash.
Ernest Demoly, 43 Rue de Trevise, Paris, France.
Giovanni Chechetti, Piazza Sicilia 1, Milan, Italy.
John Millen & Sons, Montreal, Canada.

Nuttall Mining Products

The plant capacity of the R. D. Nuttall Company was doubled in 1912 and recently this same capacity was greatly increased by the addition of a new building, and considerable new equipment.

Its principal products are gears, pinions and trolleys for mining and haulage locomotives, gearings for all types of mining machines; the plant includes the best equipped heat treating department in the country.

By the Nuttall Processes a forged steel gear or pinion of 70,000 to 85,000 pounds normal tensile strength and surface hardness of 176 to 196 Brinell* has after "SS" treatment a tensile strength of 110,000 to 125,000 pounds, a surface hardness of 302 to 264, and all the normal toughness of the untreated steel is retained. The result is a gear capable of giving twice the wear of untreated gearing at an increase of only 27% in cost. This means, in concrete figures, that if an untreated steel gear costing $12.50 will last for 100,000 miles on a mine locomotive, an "SS" gear costing $15.90 will last for 200,000 miles, and the economy in using the "SS" grade is immediately apparent. In one case the mileage is obtained at a cost of $25.00 and the expense of two gear installations; in the second case the cost of the same mileage is $15.90 and the expense of one installation; which is equivalent to an ultimate saving of $9.10, or 36.2%, plus the cost of one installation and removal.

By the BP Process a tensile strength of 115,000 to 130,000, a Brinell hardness of 418 to 555, and a service life of 350,000 miles are obtained at an increased cost of about 35%. Thus untreated steel gears costing $12.50 and lasting 100,000 miles will cost $44.00 per 35,000 miles, and a BP gear capable of giving the same mileage will cost $17.00. In this case the ultimate saving is $27.00, or 61.5%, plus the cost of three installations and three removals.

The tensile strength of case hardened gearing cannot be determined by the usual method as the steel is so hard that a test piece cannot be machined out, but it can be closely estimated from the hardness, which is 555 to 650, and is about 100000 to 140000 pounds.

Its hardness insures at least 5 times the mileage of untreated gearing or about 500000, and its cost is double. The economy depends upon annual locomotive mileage and service conditions, but in general the cost of untreated gears to give 500000 miles would be $62.50 distributed over a period of years, plus the expense of five installations and removals, making the cost per thousand miles about 8 cents. One CH grade gear giving the same mileage will cost $25.00, a saving of $37.50 or 60%, plus renewal expense, and its cost per thousand miles will be 5 cents.

All of the steel gearing for mining machines may be heat treated by any of these processes, at about the same percentages of increased cost, with the same proportionate increase in life.

Nuttall trolleys are the standards of the Westinghouse and General Electric Companies and have been adopted as standard on many mine locomotives of other makes. There are ten types, in addition to many special trolleys designed for unusual requirements, and there is a Nuttall trolley for every condition encountered in mine or industrial haulage service.

One department makes special gearing only—that is, miscellaneous, made to order gears and pinions, for hoists, pumps, crushers, machine tools, etc., and carries a stock of over 20000 patterns which includes spurs, bevels, spirals, worm gears, internal gears, herringbone gears and racks in all pitches and sizes. This department gives special attention to breakdowns and repair jobs.

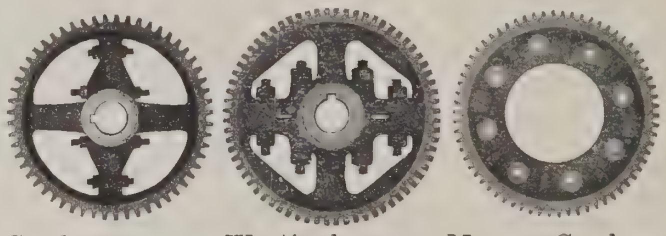
Another department is devoted to flexible couplings, making both rubber buffer type and two styles of spring type. These obviate the tedious labor and expense of aligning coupled shafts perfectly and cushion the shocks due to uneven loads on machines. The reduced wear on bearings alone saves the cost of flexible couplings many times over, and their absorption of vibration adds many years to the life of machines which would be jarred to ruin if solidly coupled.

---

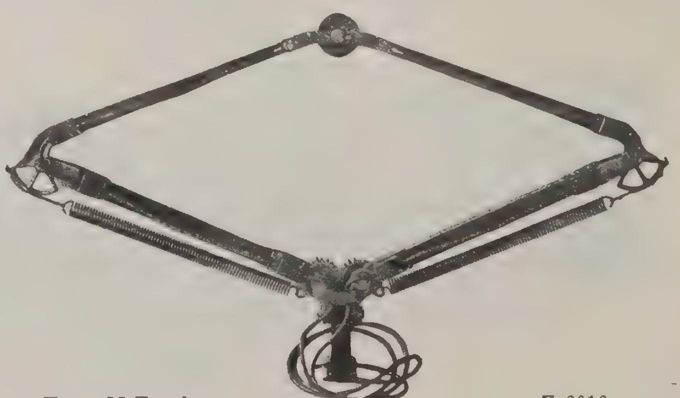
*In the Brinell Hardness Testing Machine a hardened steel ball, ten millimeters in diameter, is forceed into the surface being tested, at a pressure of 6600 pounds, and the diameter of the impression made is measured with a microscope.

The harder the steel, the smaller the impression and its dimensions indicate the hardness, and approximate tensile strength.

The hardness is expressed in the Brinell Scale, in which 600 indicates glass hard, and 150 soft.



Goodman Westinghouse Morgan-Gardner
Locomotive Gears.



Form M Trooley. Z 6016

THE TOOL STEEL GEAR & PINION CO.

CINCINNATI, OHIO

Huntington Supply & Equipment Co.
Huntington,
W. Va.

J. P. Biggert,
Oliver Building,
Pittsburgh.

U. S. Metal & Manufacturing Co.,
165 Broadway,
New York

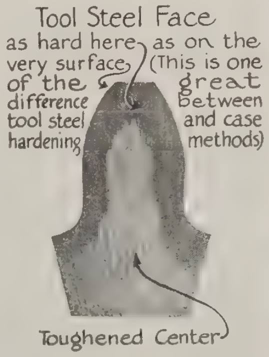
Products

"Tool Steel" Gears and Pinions for mining locomotives and machinery.

Gears and pinions constitute a considerable item in maintenance expense of coal mining equipment, both from direct costs and the costs and time lost in making replacements. Realizing this, The Tool Steel Gear and Pinion Company is now offering for coal mining equipment the same specially hardened gear and pinion which it has been selling to electric railway companies for the last nine years. A number of the larger coal mining companies have already adopted "Tool Steel" gears as standard in their replacements.

The "Tool Steel" wearing face takes on a brilliant polish and virtually eliminates friction.

The toughened center withstands all shocks and strains in severe service.

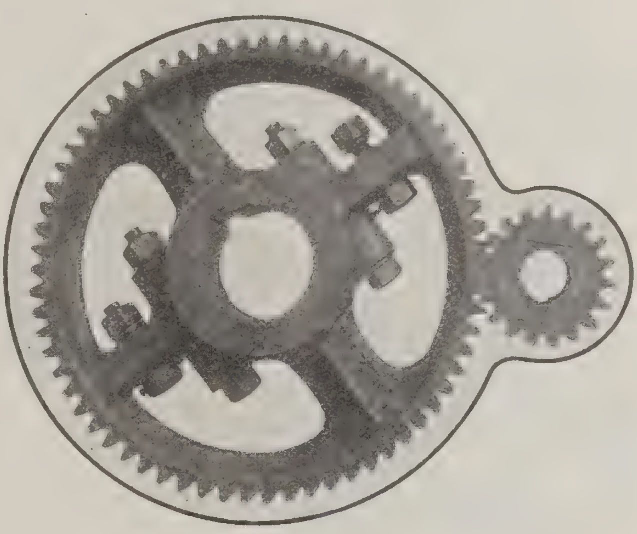

Tool Steel Face
as hard here as on the very surface
(This is one of the great difference between tool steel and case hardening methods)
Toughened Center

Increased Life of "Tool Steel" Gears

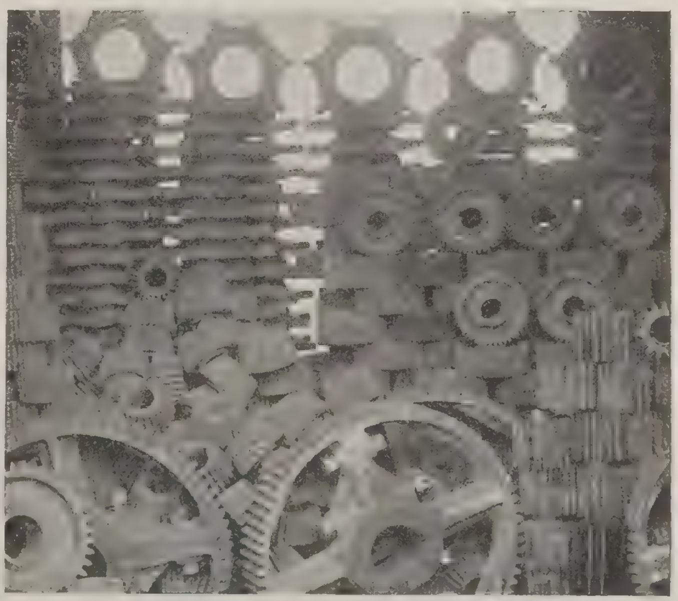
In repeated tests in the electric railway and coal mining industries, "Tool Steel" gears have given life from four to seven times as great as that averaged from ordinary untreated steel, from three to six times as great as that of oil treated steel and from two to four times as great as case hardened material.

Guaranteed Life

"Tool Steel" gears are sold under a positive guarantee to wear at least three times as long as untreated steel.



The photograph above is of a "Tool Steel" motor gear and pinion after 2½ years' use. In this particular service the average life of the untreated pinion was only six months.



This illustrates some of the classes of coal mining gears we are furnishing in quantities

BULLETINS AND QUOTATIONS FURNISHED ON REQUEST.

THE VAN DORN & DUTTON CO.

CLEVELAND

New York
Baltimore
Atlanta

Denver
San Francisco
Salt Lake City

"Van Dorn"
TRADE MARK

GEAR SPECIALISTS

"V. D. & D." Gears and Pinions

Are a distinctive type of steel product made especially to yield long service. For the operation of mining locomotives and machinery these gears will prove not only the most efficient, but the most economical as well.

Smooth running and long wearing gears drive with less power, protect the machinery from vibration, and save much in the cost of new gears.

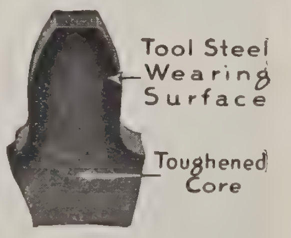
The many traction lines that use "V. D. & D." gears know the greater value of our special hardened and treated gears. The question with them today is not—can we afford to use hardened and treated gears—but—can we afford not to use them?

Two Grades That Meet Every Condition.

For over twenty years we have devoted ourselves exclusively to the manufacture of gears and pinions. The development of our grades HARDENED and TREATED is the result of our long experience.

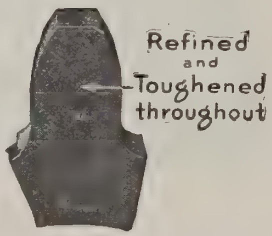
Grade HARDENED For General Service

Maximum wear and strength are secured by our special process of hardening. The wearing surface is converted into tool steel to insure wear; at the same time the core is toughened to give strength.



Grade TREATED For Heavy Duty Service

Great strength and long service are outstanding features of our grade TREATED. Our special process of heat treatment refines and toughens the steel throughout, reducing the possibility of breakage to a minimum.



We are Gear Specialists—and likewise Gear Experts in the selection of the proper material, in the accuracy of the machinery and cutting, as well as in the treating of the finished product.

"V. D. & D." Gears are gears of an exceptional quality that are particularly adapted to your requirements. You can easily determine this fact by making a test case of a few of our gears. They will soon convince you that gears made with special care and skill and scientifically treated to endure certain conditions are logically the right gears.

"V. D. & D." Gears will give you long satisfactory service and materially lower your operating cost.

Our Big New Plant

"V. D. & D." Gears are now made in a big new plant which is undoubtedly one of the finest of its kind in the country.

The demand for our product became so great, that in 1915 we began the erection of a factory of greater capacity. This gave us the opportunity to plan our facilities in the way our long experience in gear manufacturing taught us to want them. The up-to-date equipment, perfect shop arrangement and excellent transportation accomodations that our new plant possesses, cannot help but lead to better quality than ever in "V. D. & D." gears.

An all important feature that will mean much to the buyer of "V. D. & D." gears is the large and completely equipped steel hardening and heat treating plant. When you know where "V. D. & D." gears come from, you do not wonder at their superiority.

Send Us Your Specifications. We Shall Be Glad To Quote Prices.

The Alexander Car Replacer Mfg. Co.

SCRANTON, PA

Products

Car Replacers, Wrecking Frogs.

Advantages

All mining men are well aware that derailments in the mine is one of the most frequent causes of delay. A locomotive or a car off the track ties up the whole transportation system, as well as the Tipple or Breaker.

Figure up for yourself the loss of tonnage and the cost resulting in such a tie-up.

It is quite obvious that the quicker you get the derailed locomotive or car back on the track the less will be your loss of time and money. With the Alexander Car Replacer these delays can be minimized. Derailments can be gotten back on the track in a very short time.

Each locomotive you have should be equipped with a pair of our car replacers, or in the case of a rope haulage system, a pair should be placed easy of access along plane or runway.

Sizes We Manufacture

No. 1 REPLACER—Weight 164 lbs. per pair; used on rail 5 to 6 inches high.

No. 2 REPLACER—Weight 158 lbs. per pair; used on rail 4 to 5½ inches high.

No. 3 REPLACER—Made of ⅜-inch steel plate for Electric Motors, Mine Engines, Electric Cars, and light equipment.

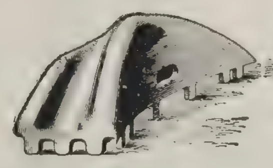
No. 1 EXTRA HEAVY—Made of ¾-inch plate, weight 212 lbs. per pair; same rail as standard No. 1.

Our Number Three Re- is the size we sell to the mines for use inside the mine, while the other sizes are sold for use in the yard and sidings and for standard R. R. service.

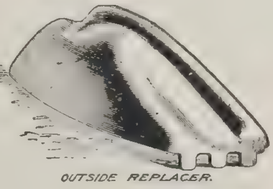
Material

Our No. 3 Replacers are made from 6-16 inch pressed steel. They have strength without weight. Quality, not quantity. This is the reason we make the Alexander Replacer of Steel Plate instead of cast metal. The illustration shown herewith will give you an idea of how easily they are handled.

There are now over seventy-five thousand pair of Alexander Replacers in use. Practically every railroad in the United States and Canada are equipped with them. Below we give a few letters and a partial list of mining companies who have equipped their mines with the Alexander Replacer.



INSIDE REPLACER.
Fig. 436 C



OUTSIDE REPLACER.
Fig. 437 C

Scranton, Pa., April 6th, 1912.

We use the "Alexander Replacers," inside and outside of our collieries, and find them very satisfactory—a money-saver in getting our daily output.

THOS. J. WILLIAMS.
Div. Supt. D., L. & W. Coal Dep't.

THE DELAWARE & HUDSON COMPANY.
Office of Superintendent Coal Department.
Scranton, Pa., Oct. 26th, 1910.

The Alexander Car Replacer Mfg. Co.,
Scranton, Pa.:

Dear Sir—In reply to yours of the 24th inst. wish to state that we have nearly one hundred of the No. 3 Alexander Car Replacers distributed about our collieries for replacing mine locomotives as well as cars on rope haulage. I find them almost indispensible, and it gives me pleasure to recommend them. Yours respectfully,

C. C. ROSE, Superintendent.

THE DELAWARE, LACKAWANNA & WESTERN RAILROAD CO.
Coal Mining Department.
Scranton, Pa., Oct. 17th, 1910.

The Alexander Car Replacer Mfg. Co.,

Gentlemen—I am in receipt of your letter of the 15th inst. asking for information as to the service rendered on inside work of the Car Replacer purchased from your Company.

We have in service in our different collieries about 160 pairs of your size No. 3, and I can only say that I have heard the best reports of their service, and we are now equipping all of our Electric Motors with this size Replacer.

Yours truly,
R. A. PHILLIPS, General Superintendent.

SOME OF OUR USERS AMONG MINING COMPANIES

Allegheny Ore & Iron Co.
Cambria Steel Co.
Colorado Fuel & Iron Co.
Consolidation Coal Co.
Delaware & Hudson Co.
D., L. & W. Coal Co.
Ellsworth Coal Co.
Fairmont Coal Co.
H. C. Frick Coke Co.
Hillside Coal & Iron Co.
Kingston Coal Co.
LaBelle Iron Co.
Lackawanna Iron & Steel Co.
Lehigh Coal & Navigation Co.
Lehigh Valley Coal Co.
Lehigh & Wilkes-Barre Coal Co.
Loup Creek Colliery Co.
G. B. Markle & Co.
Mineral R. R. & Mining Co.
New River & Pocahontas Coal Co.
New River Collieries Co.
Nova Scotia Steel Co.
Oliver Iron & Mining Co.
Pancoast Coal Co.
Pardee & Co.
Parish Coal Co.
Pennsylvania Coal Co.
Philadelphia & Reading Coal & Iron Co.
Piney Coal & Coke Co.
Rochester & Pittsburgh Coal & Iron Co.
St. Clair Coal Co.
Semet Solvay Co.
Sterrick Creek Coal Co.
Summit Branch Mining Co.
Temple Iron Co.
Tennessee Coal & Iron Co.
Thomas Iron Co.
Vesta Coal Co.
Virginia Coal & Iron Co.
West End Coal Co.
Wheeling Steel & Iron Co.
Wisconsin Steel Co.
and many others.

INDIANA FOUNDRY COMPANY

INDIANA, PA.

Sutton Sand Drying Stoves

Products

Sand Dryers, Plain Heating Stoves, Etc.

Sutton Sand Drying Stove

The complete sand dryer made in 3 sizes.

Simple in design, very massive, and will stand the hardest usage. May be fed with hard or soft coal, coke or wood.

No. 1 weighs nearly 1,200 pounds. Capacity under ordinary conditions about 10 tons daily.

No. 2 weighs nearly 700 pounds. Capacity under ordinary conditions about 5 tons daily.

No. 3 is two-thirds the size and capacity of No. 2.

DIMENSIONS

Extreme height of Sand Dryers..	inches	58	49½	48¾
Height from base to top.........	"	48	40	38¼
Height of legs..................	"	10	10	10
Size of Firedoor................	"	10 x 12	10 x 12	11 x 11
Inside diameter	"	23	17	15
Grate diameter..................	"	22	15	12½
Skirting at top, diameter.......	"	52	40	39
Distance from insider fire door to back of stove...............	"	33	27	23¼
Thickness of castings...........	"	1¼	⅞	¾
Skirting capacity, cubic feet of	sand	18½	8½	7½

Service

When the United States Government decided to buy Sand Dryers for the Panama Canal, the engineers in charge prepared a series of exhaustive tests of several makes and after thorough investigation and demonstration, adopted the SUTTON.

The government experts also made a careful analysis of the iron in order to secure the best fire-resisting castings.

What Does This Mean to You?

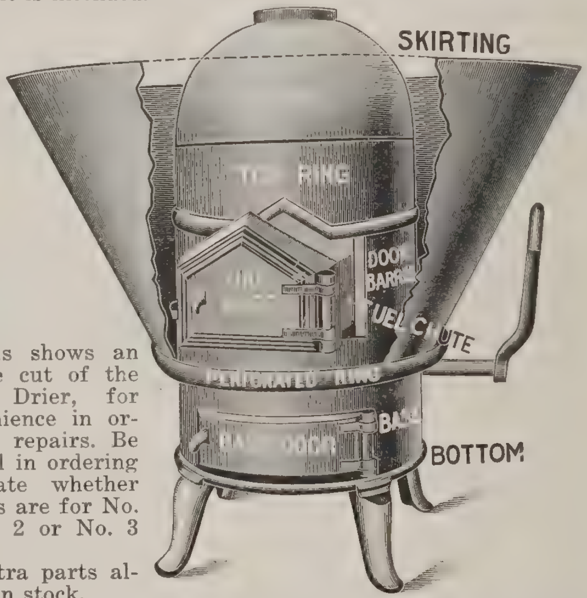
And what does it signify to you that the Sutton Sand Dryer is used in all the Government Navy Yards?

There is no Sand Dryer that does the work as economically and thoroughly as the Sutton.

Over two hundred Steam Railways, ranging in size and importance from the Pennsylvania Railroad and New York Central Systems to small lines having but one or two locomotives, use the Sutton Sand Dryer.

More than one thousand Sutton Sand Dryers are used in the Collieries of Pennsylvania alone.

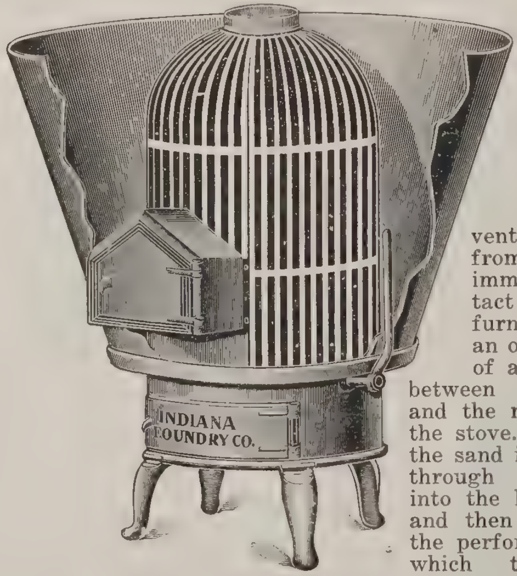
We guarantee the Sutton Sand Dryer to give satisfaction under all circumstances when used for the purpose for which it is intended.



This shows an outline cut of the Sand Drier, for convenience in ordering repairs. Be careful in ordering to state whether repairs are for No. 1, No. 2 or No. 3 stove.

Extra parts always in stock.

Always have a good fire in the stove before the sand is put in. Otherwise, the sand may bake and not discharge itself.


INDIANA FOUNDRY CO.

This cut represents the Upright Cast Iron Grating with which we surround the main body of our Sand Drier to prevent the wet sand from coming into immediate contact with the hot furnace. There is an open air space of about 1½ ins. between the grating and the main body of the stove. As soon as the sand is dry it runs through this grating into the hot air space and then out through the perforated ring on which the skirting rests. This permits the wet sand to dry much more rapidly than when it comes into immediate contact with the hot stove. Gratings prolong the life of the castings and are economical on fuel. Some of our customers claim that it fully doubles the amount of sand that can be dried in the same length of time.

Gratings are not furnished with the Sand Stoves unless ordered.

Plain Heating Stoves

We make several types of Plain Heating Stoves, in all capacities suitable for store, shop, etc., where heating is required.

KEYSTONE
THE.
MINING
CATALOG
COMBINED WITH
COAL FIELD
DIRECTORY
CONSOLIDATED PUBLISHING
COMPANY INC.

MINING MACHINE SECTION

Engineering Data

Chart—Cost of Coal.

Specification Data for Mining Machines.

Coal Production for Various Thickness of Seams.

The following manufacturers have catalogue descriptions in this section:

- Buettner & Shelburne Machine Co.
- Empire Chemical Co.
- Fairmont Mining Machinery Co.
- General Electric Co.
- Goodman Mfg. Co.
- Howells Mining Drill Co.
- Ingersoll-Rand Co.
- Jeffrey Mfg. Co.
- Morgan-Gardner Electric Co.
- Pneumelectric Machine Co.
- Prox, Frank, Co.
- Scranton Electric Construction Co.
- Sullivan Machinery Co.
- Tracy, Bertrand P.

For additional descriptions of Mining Machinery and Equipment, not appearing in this section, refer to Index of Products in front of book.

Specification Data for Mining Machines

Type required

- Chain Breast
- Shortwall
- Overcutting
- Puncher—Air
- Puncher—Electric

Kind of Coal.

Thickness of Vein.

- Thinnest place
- Average Thickness

Location of Impurities.

Kind of Impurities.

Roof

- Rock
- Slate
- Wet
- Dry

How far back from face can posts be set?

No. Rooms opened up.

- Width.

Voltage—character of current.

Distance from power plant to limit of workings.

Switch radius.

Clearance between rail and rib—entries.

Clearance between rail and rib—room necks.

Pick Rate

Pick yardage.

Machine yardage.

Rate per day—Runner—Scraper. Hours per shift.

Loading rate

- Shooting
- Propping
- Track Laying.

Will machines be used on ribs?

Track Gauge—Kind of rail.

For Chain Breast Machines

- Cut—depth.
- Cut—width.
- Length of cable required.
- Open or closed type motor.
- Self propelling or not.

Shortwall Machine

- Depth of cut.
- Length of cable required.
- Self propelling or not.

Overcutting Type

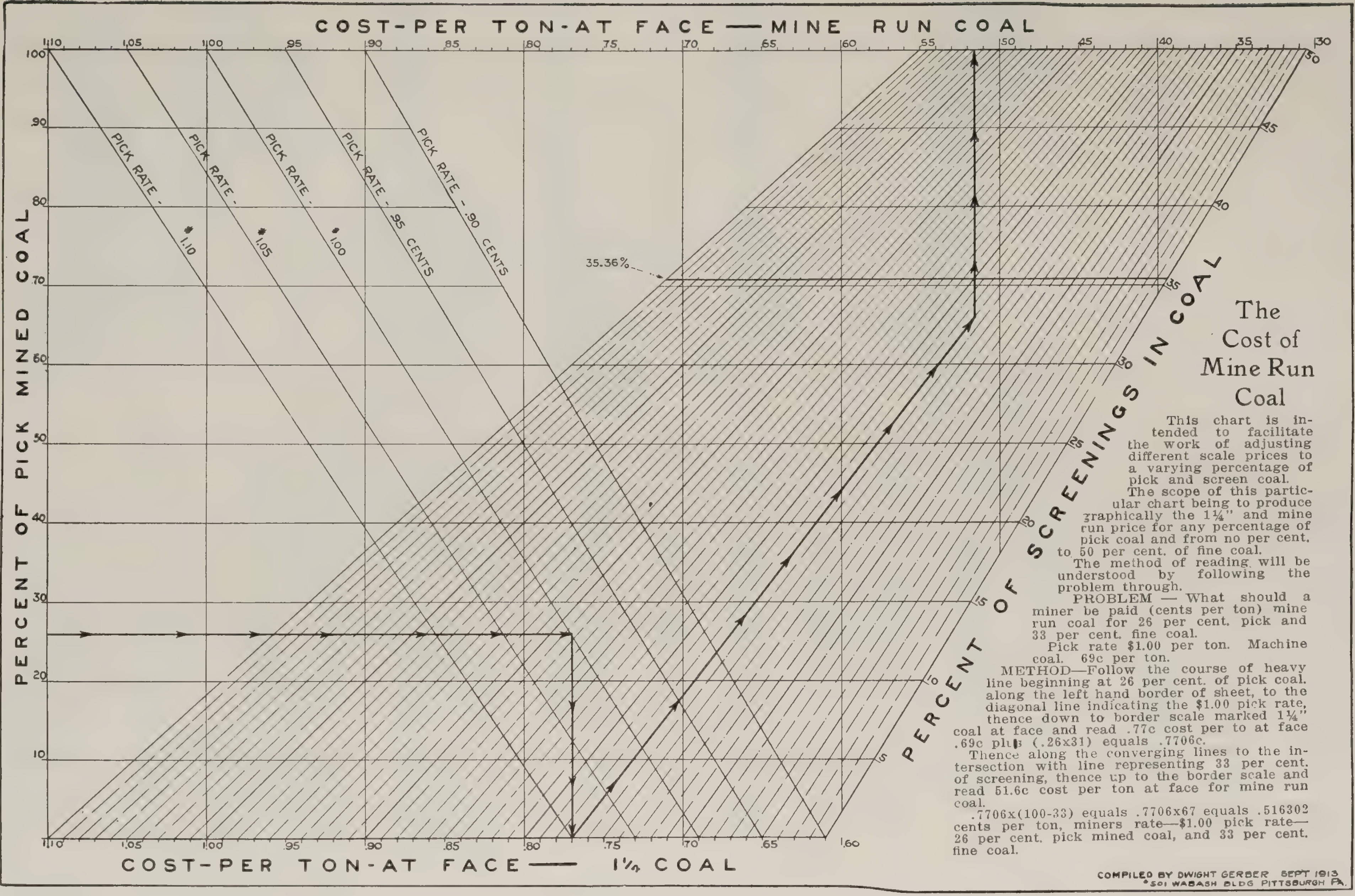
- Width of place to be cut.
- Location of impurities.
- Charcter of impurities.
- Length of cable required.
- Self propeller or not.

Puncher Type—Electric

(See general information.)

Puncher Type—Air

- Air pressure at face.



The Cost of Mine Run Coal

This chart is intended to facilitate the work of adjusting different scale prices to a varying percentage of pick and screen coal.

The scope of this particular chart being to produce graphically the 1¼" and mine run price for any percentage of pick coal and from no per cent. to 50 per cent. of fine coal.

The method of reading will be understood by following the problem through.

PROBLEM — What should a miner be paid (cents per ton) mine run coal for 26 per cent. pick and 33 per cent. fine coal.

Pick rate $1.00 per ton. Machine coal. 69c per ton.

METHOD—Follow the course of heavy line beginning at 26 per cent. of pick coal. along the left hand border of sheet, to the diagonal line indicating the $1.00 pick rate, thence down to border scale marked 1¼" coal at face and read .77c cost per to at face .69c plus (.26x31) equals .7706c.

Thence along the converging lines to the intersection with line representing 33 per cent. of screening, thence up to the border scale and read 51.6c cost per ton at face for mine run coal.

.7706x(100-33) equals .7706x67 equals .516302 cents per ton, miners rate—$1.00 pick rate—26 per cent. pick mined coal, and 33 per cent. fine coal.

COMPILED BY DWIGHT GERBER SEPT 1913
501 WABASH BLDG PITTSBURGH PA.

Coal Production for Various Seam Thicknesses

Short Tons

Density of Coal Assumed as 1.28, or
25 Cubic Feet per Ton of 2,000 Pounds

Height of Coal, Inches	Tons of Coal, per Acre	Tons per Square Foot Undercut	Depth of Undercut		
			5 Ft.	6 Ft.	7 Ft.
			Tons per Lineal Foot of Face		
24	3485	0.08	0.40	0.48	0.56
28	4070	.09	.47	.56	.65
32	4645	.11	.54	.64	.75
36	5225	.12	.60	.72	.84
40	5810	.133	.67	.80	.93
44	6390	.15	.73	.88	1.02
48	6970	.16	.80	.96	1.12
54	7840	.18	.90	1.08	1.26
60	8715	.20	1.00	1.20	1.40
66	9580	.22	1.10	1.32	1.54
72	10455	.24	1.20	1.44	1.68
78	11320	.26	1.30	1.56	1.82
84	12210	.28	1.40	1.68	1.96
90	13070	.30	1.50	1.80	2.10
96	13940	.32	1.60	1.92	2.24
100	14525	.333	1.67	2.00	2.33
104	15100	.347	1.73	2.08	2.42
108	15680	.36	1.80	2.16	2.52
112	16260	.373	1.87	2.24	2.61
116	16845	.387	1.93	2.32	2.70
120	17425	.40	2.00	2.40	2.80
126	18295	.42	2.10	2.52	2.94
132	19165	.44	2.20	2.64	3.08
138	20040	.46	2.30	2.76	3.22
144	20900	.48	2.40	2.88	3.36

GOODMAN MANUFACTURING CO.

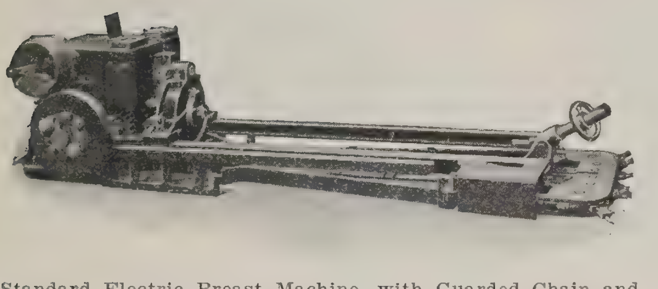
ELECTRIC MINING MACHINERY

General Office and Works: Chicago, Ill., Halsted Street at 48th Place.

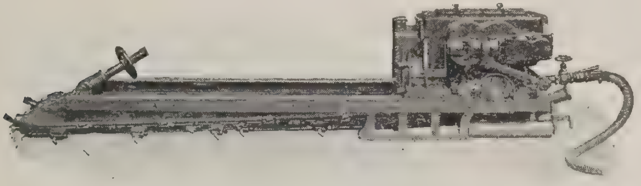
BRANCH OFFICES AND REPRESENTATIVES:

PITTSBURGH, PA.—Farmers Bank Bldg.
CINCINNATI, O.—220 East Fourth Street.
CHARLESTOWN, W. VA.—Union Bldg.
BIRMINGHAM, ALA.—Brown-Marx Bldg.
NEW YORK, N. Y.—200 Fifth Avenue.
ST. LOUIS, MO.—Boatmen's Bank Bldg.
DENVER, COLO.—Boston Bldg.
SEATTLE, WASH.—512 First Ave., South.

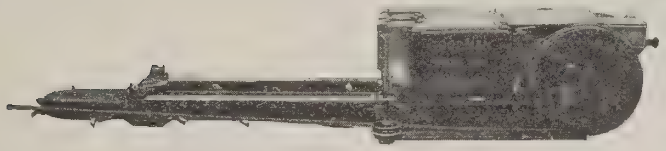
AUSTRALASIA—Wm. Adams & Co., Sydney, N. S. W.



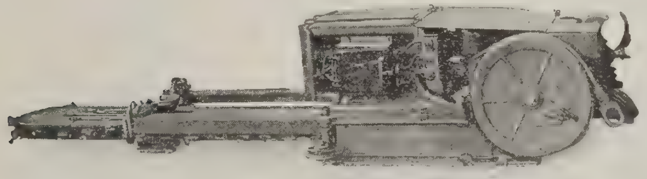
Standard Electric Breast Machine, with Guarded Chain and Flame Proof Electrical Parts.



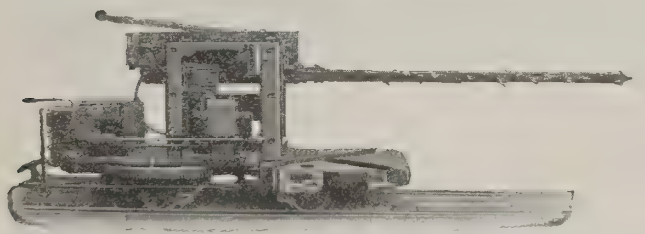
Standard Breast Mchine with Balanced Air Engine. Convertible to Electric.



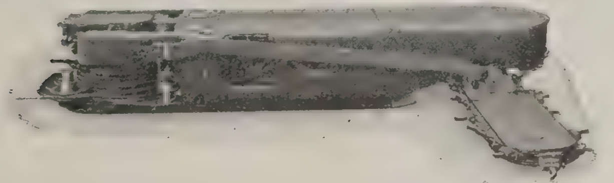
Shortwall Machine, with Chain Guard Extended as in Dragging to the Face.



Shortwall Machine, for Alternating Current.



Straightface Overcutting Machine.



Longwall Machine for Continuous Faces.

Goodman Electric Coal Cutters are made for operation by either direct or alternating current.

All parts are designed with generous proportions, for needed strength and durability. Gears especially are large and ample.

Electric machines may be furnished with inclosed parts, for operationg in gassy places.

Air driven machines may be used in gassy mines, or where compressed air already is available.

Breast and Shortwall types are furnished with drop-front trucks (patented), making loading and unloading easy, rapid and safe.

Guarding of cutter chains in all types affords protection to men and fullfills all legal requirements.

The Shortwall machine operates entirely by its own power, has no subsidiary parts for use in sumping, and by its methods of control enables the runner to meet positively and quickly all the varying conditions of his cutting.

The Straightface machine is an overcutter, which works from position on the room track and maintains a square place, with straight face and ribs. It will cut at any height in the seam, from very top to within a few inches of the bottom. It may mine in or near a dirt band which then may be kept out of the loaded coal.

The Straightface machine operates wholly by its own power, loses no time in unloading and reloading at the face, and otherwise proves itself a full-functioned machine. It does what no other machine has ever attempted, and similar results therefore are not expected of any other machine.

Longwall machines are built for direct or alternating current. They are made either reversible or non-reversible, and all are equipped with tilting arms to enable following the floor undulations.

Full Descriptions in:—
Bulletin 104—Breast Machines.
Bulletin 103—Shortwall Machines.
Bulletin 121—Straightface Machines.

THE JEFFREY MANUFACTURING COMPANY

Main Office and Works: 962 North Fourth St., Columbus, Ohio

SALES OFFICES:

New York............50 Dey Street
Boston..............141 Milk Street
Philadelphia. Real Estate Trust Bldg.
Pittsburgh......Farmers Bank Bldg.
Scranton, Pa.. Union Nat. Bank Bldg.
Broadwell, O.......H. H. Townsend
Middlesboro, Ky.. Middlesboro Hotel
Charleston............West Virginia
Chicago............McCormick Bldg.
St. Louis...Railway Exchange Bldg.
Milwaukee............M. & M. Bldg.
Denver....First National Bank Bldg.
Seattle............L. C. Smith Bldg.
Birmingham......Brown-Marx Bldg.
Dallas..........................Commonwealth Nat. Bank Bldg.
Canadian Works............Montreal

"Under-Cutting" Coal Mining Machines

Shortwall Coal Cutters

For Continuous Cutting in Room or Pillar Mining.

Self Propelling

Machines unload from truck, cut across the face, move about the room and load onto truck all under their own power.

Cutter Bars

Latest design made of structural steel with renewable tool steel wearing strips. Cutter chains are machine finished and tempered—will not wear or elongate.

Ball Bearings on Armature Shaft

practically eliminate motor troubles.

Provided with Power Driven Retarding Drum, Front and Rear Cable Drums, Automatic Cable Reel.

All Wearing Parts Large and Heavy—reducing maintenance cost to a minimum.

Latest Type 36-B or "Baby Shortwall"

is especially adapted for work in low veins.

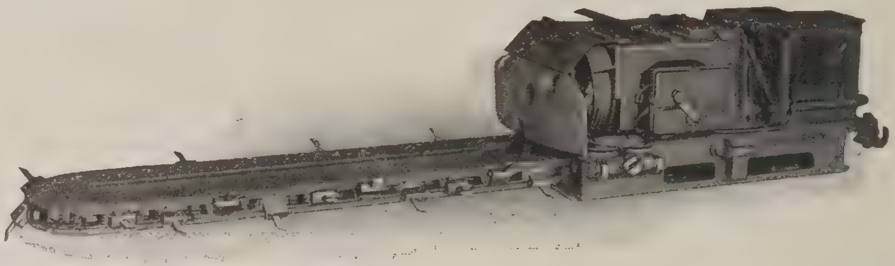
Longwall Coal Cutters

For Continuous Faces.

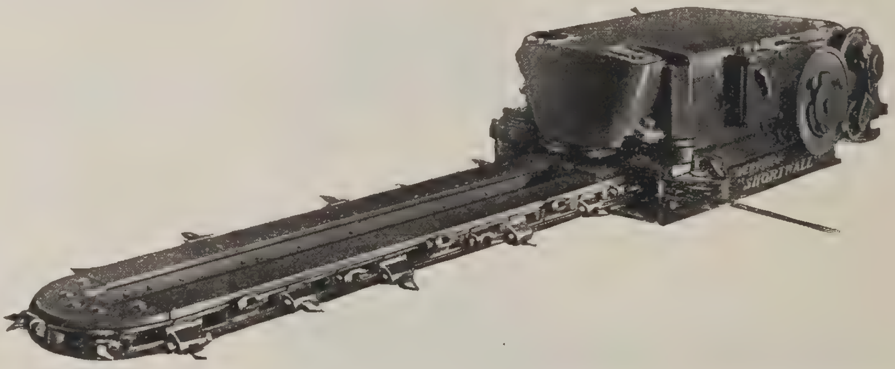
Equipped with Direct or Alternating Current Motors or Air Turbines.

Special Features:

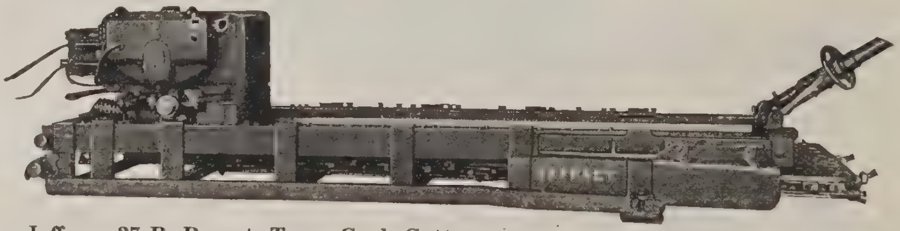
Noiseless Worm Gearing between motor and drive sprocket; Compactness; Power Turned Cutter Arm; Large Capacity Motors; Totally Enclosed Motors and Starting Boxes.



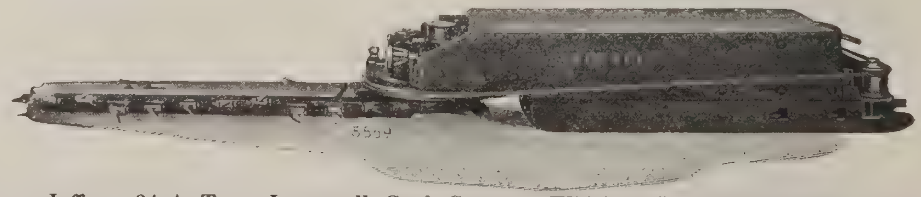
Jeffrey 28-A Shortwall Coal Cutter with Class 11 Starting Box.
Overall height 24". Magnetic Type of Starting Box, either open or totally enclosed. Motor of the Consequent Pole Type—built either open or enclosed.
Full description in Bulletin No. 118-62.



Jeffrey 35-A Shortwall Coal Cutter for Extra Heavy Cutting.
Large Motor Capacity and Extra Heavy Construction. Totally Enclosed Motor. Multiple Disc Clutches on the Feed and Handling Mechanism. Self-Propelling Truck—speed from zero to 400 ft. per minute in either direction without reversing motor. Machine is 22" high.
Bulletin No. 116-62 has full details.



Jeffrey 27-B Breast Type Coal Cutter
Also furnished in types and sizes known to the mining trade as 17-A, 19-A, 21-A and 16-D.

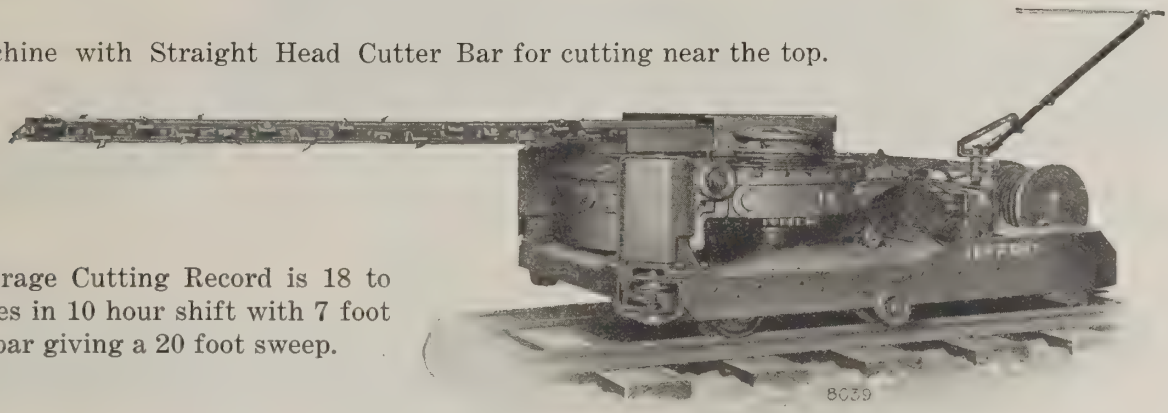


Jeffrey 24-A Type Longwall Coal Cutter. Width 31"—Height overall 18". Type 36-A or "Baby Longwall" Machine for thin veins has an overall height varying from 13¾ to 15".
Ask for Bulletin No. 138-62.

THE JEFFREY MANUFACTURING COMPANY

The Jeffrey Arcwall Coal Cutter

Machine with Straight Head Cutter Bar for cutting near the top.



Average Cutting Record is 18 to 20 places in 10 hour shift with 7 foot cutter bar giving a 20 foot sweep.

Advantages in Using the Jeffrey Arcwall:

Cuts from 100 to 200 per cent. more places than unmounted machines.

Acts as its own locomotive.

Self-Contained and Self-Propelled—no loading, unloading, shifting on floor.

Decreases mining costs because of the increased output, less machines and labor required.

Produces cleaner coal with less picking at the tipple, because dirt bands and slate seams can be cut out and gobbed.

Produces more lump coal because less charges of power are required in shooting—coal is not shattered so much.

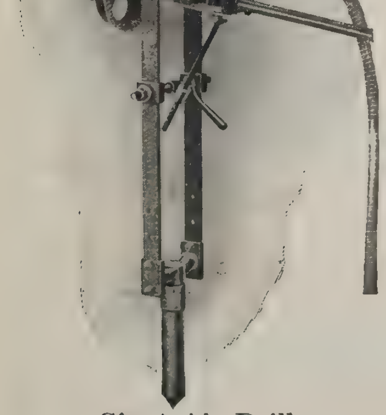
Protects tender roofs—lessens the danger of blown-out shots.

Send for Illustrated Bulletins and full particulars of the "Over-cutting" System of Mining.

JEFFREY POWER DRILLS
(Patented)

Made with either Electric, Air, Steam or Hand Power.

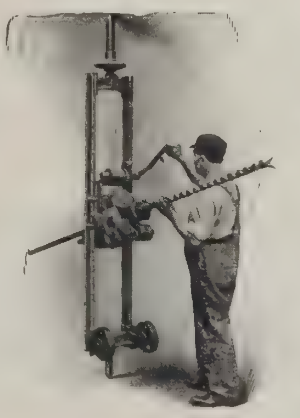
Send for Special Bulletin.

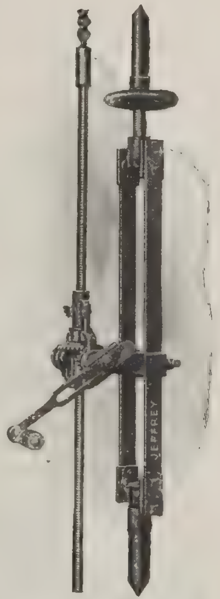


Giant Air Drill

A-5-C Electric Power Drill

Carrier wheels at base of frame and on motor make it a "one man" portable drill. Ratchet device affords an easy adjustment. Will drill through any material that the auger-bit will stand up under.





Hand Drill

For use where air power or electricity are unobtainable.

MORGAN-GARDNER ELECTRIC CO.

68 E. Adams St., Chicago, Ills.

COAL CUTTERS

Heavy Strong Machines for difficult cutting.

Light Speedy Machines for easy cutting.

Machines for thin, medium or thick veins.

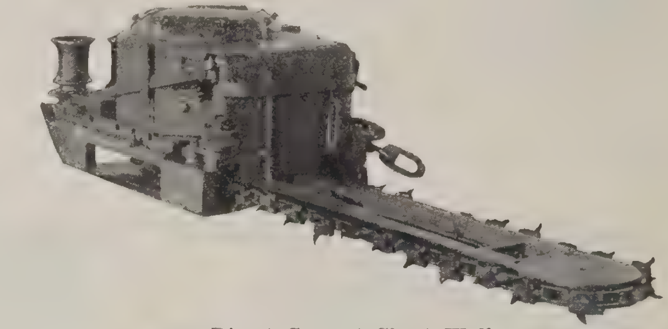
Breast, Short Wall, Long Wall, Overcutting and Special machines.

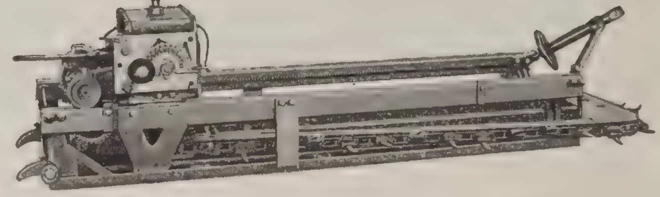
Machines with standard or narrow kerf, single, double, or modified double bit chains—Cutterarms of any length to suit your mining conditions.

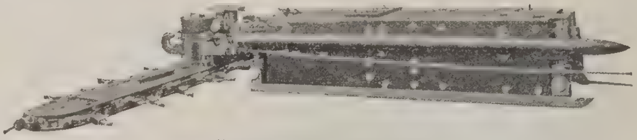
Now successfully cutting Bituminous, Lignite and Anthracite Coal, Dirt Bands and Fire Clay.

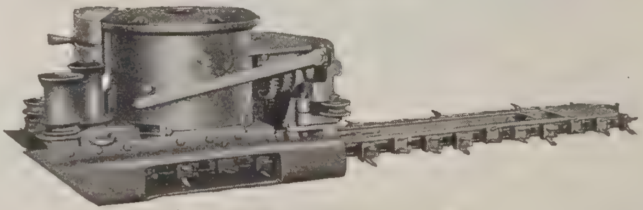
Coal Cutters with all modern improvements—Motored and equipped to do their work without distress to any of their parts, without waste of power and without unnecessary or excessive drains upon the current supply.

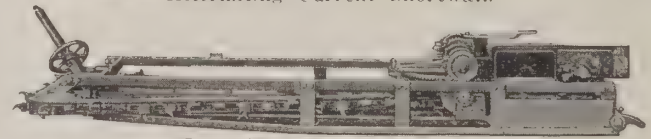
Designed and built—as a whole and in every detail—for low cost of maintenance—long life—effective and satisfactory service.


Direct Current Short Wall.

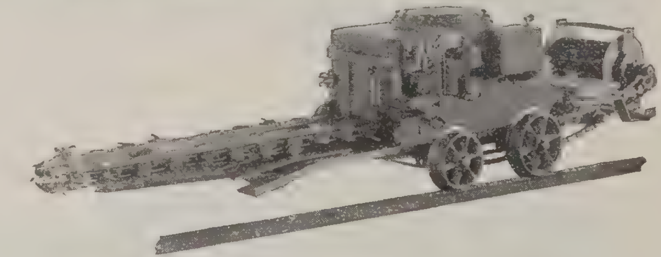

D. C. or A. C. Breast Machines.


Long Wall Machines.


Alternating Current Shortwall.


Long Vein Breast Machine.

Overcutting Machine.


Self Propelling Trucks for Mining Machines.

MORGAN-GARDNER

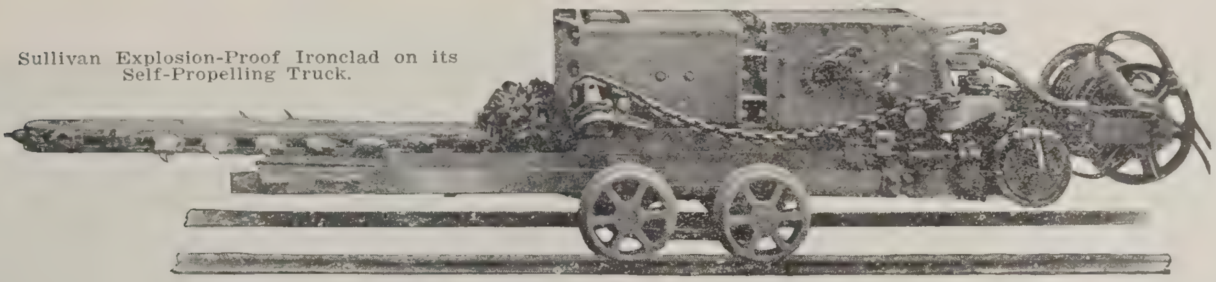
68 E. ADAMS ST "ELECTRIC CO." CHICAGO U.S.A.

SULLIVAN MACHINERY COMPANY

122 So. Michigan Avenue, Chicago, U. S. A

Works: CHICAGO; CLAREMONT, N. H.

BOSTON
BUTTE
DENVER
EL PASO
HUNTINGTON
JUNEAU
KNOXVILLE
LONDON
NEW YORK
PARIS
PITTSBURGH
SCRANTON
ST. LOUIS
SALT LAKE
SPOKANE
SYDNEY
VANCOUVER
PETROGRAD

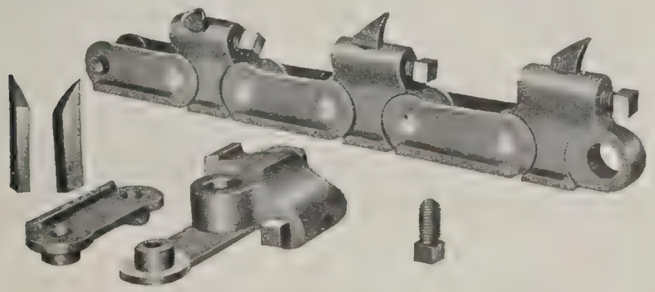


Sullivan Explosion-Proof Ironclad on its Self-Propelling Truck.

Sullivan Ironclads---The Continuous Coal and Cost Cutters

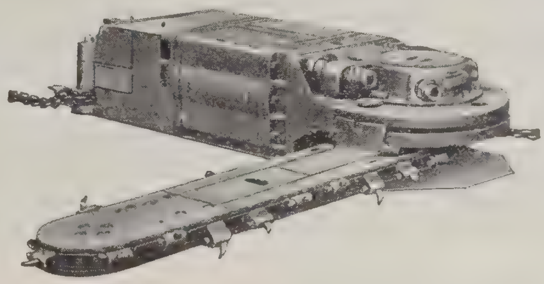
Ironclads
are available for continuous cutting on the pioneer Sullivan principle, in rooms, or for longwall mining. They are of uniform size—30 H. P., but may be operated by either D. C. or A. C. electric motors, or "Turbinair" spiro turbine air motors, as required. **Distinctive Ironclad Features** include:

1. Explosion-proof, Government approved, permissible electric motors, for safe use in gassy mines. The protective devices may be added in the field if necessary.
2. Chain feed, durable, strong, flexible.
3. Automatic, spring-loaded safety friction clutch protects drive mechanism from strain due to overload.
4. Ironclads are reversible, can cut in either direction by merely turning the cutter bits around.
5. The advantages of deep undercutting are most fully realized with Ironclads. Cutter bars 10 ft. and longer are used for this purpose on standard Ironclads.



A detail of Sullivan Ironclad Cutter Chain. Note interlocking arrangement of blocks and links. This chain is exceedingly strong and durable.

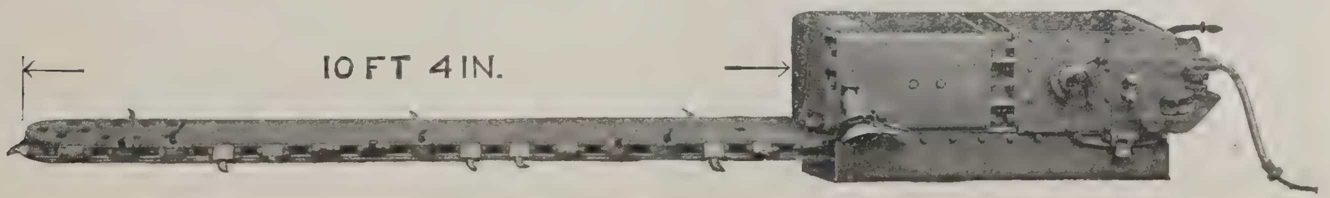
6. Interlocking link, ribbed cutter chains, roller bearing cutter heads; self-winding reels; friction brakes and tight armorplate housings are Ironclad features that stand for power and repair economy, convenience and safety.
7. **Mounted Swivel Ironclads** are available for entry cutting from the track.
8. "A. C." motor can be substituted in the field for "D. C." or vice versa, or "Turbinair" engines for either.



Sullivan Turbinair Ironclad Longwall Coal Cutter, Class CH-8, with Spiro-Turbine Air Motor.

9. **Ironclads** make a straight, clean cut at the bottom of the seam, leaving no ribs or sprags. This means light shooting, clean coal and a large proportion of lump.
10. **Ironclad** cuttings are coarse, being often sold as pea or small nut sizes.
11. **Ironclads** consume 12 to 20 H. P. while cutting and 4 H. P. while moving about the mine.
12. Ironclads perform all operations under their own power.
13. In power consumption per ton mined, in repair cost, in rapidity of production, in ease of operation, in adaptability to conditions, **Ironclads** stand for highest efficiency among coal mining machines.

Bulletin 63 MD contains the details. Ask for it.
Sullivan Pick Coal Machines, Bulletin 57 D.
Sullivan Post Punchers, Bulletin 57 AD.



A "Long Bar" Sullivan Ironclad, for deep mining.

INGERSOLL-RAND COMPANY

11 BROADWAY NEW YORK

Manufacturers of Compressed Air Coal Mining Machinery

"Jackhamer"

A fast drilling, easily handled, hammer drill. It has a strong, positive, automatic rotation and when used with twisted steel is a superior tool for boring coal.

Fitted with hexagon steel the "Jackhamer" is a rock drill that has almost universal application. It can be used for any of the rock drilling jobs around the mine from shaft sinking and driving gangway to ditching, cutting hitches, etc.

It can be slipped into a feed shell mounting when desired and can also be had with the Leyner Water Device.

Bulletin 4221.

"Radialaxe" Coal Cutter

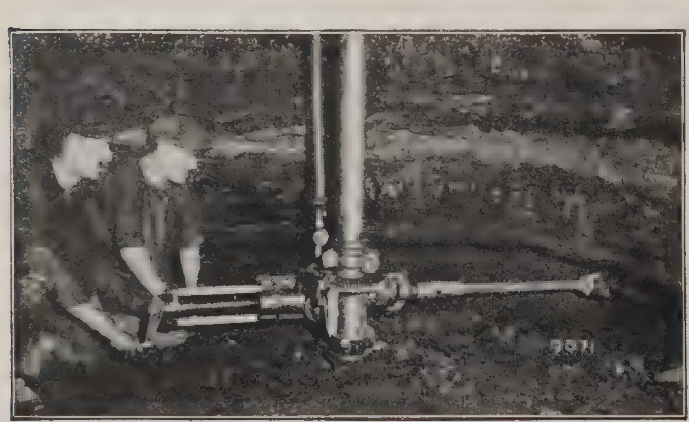
For undercutting in a pitching seam, overcutting, shearing, driving entries and cutting out clay bands the Radialaxe will work faster, at less cost and with greater certainty than any other means.

It is an air driven machine which will make a long deep cut in the coal face, at any angle from horizontal to vertical.

You can also use it for regular rock drilling.

The "Radialaxe" is a valuable addition to the equipment of every up-to-date coal mine.

Bulletin 5006.



"New Ingersoll" Coal Puncher

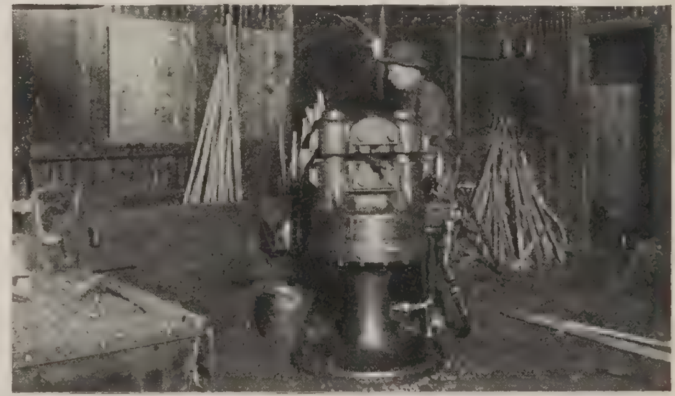
An all around puncher, adopted to hard or soft coal, thick or thin seams, high or low pressure.

It strikes hard, costs less for repairs, is correctly balanced and practically vibrationless. Its reliability insures full tonnage every day.

It is a safe machine—it cannot "race" nor is there any deadly recoil. An automatic throttle cuts off the air when the pick misses and opens up again when cutting begins.

The "New Ingersoll" puncher is "The Pick without a Kick."

Bulletin 5003.



Leyner Sharpener

An air operated machine for forging and resharpening drill bits and chain cutter bits, and forming drill shanks of all kinds, bolts, coupling pins, etc.

It is compact and safe and is the most efficient means of doing such work.

A single lever controls all operations. All work is done in the machine.

Bits made in the Leyner Sharpener are correctly formed and guaged, cut faster, remain sharp longer, and can be produced at a fraction of the cost of hand labor.

Bulletin 4122.

The Pneumelectric Machine Company

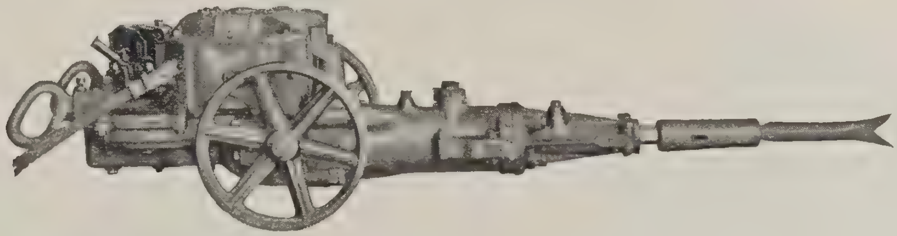
SYRACUSE, N Y.

Pneumelectric
TRADE MARK

Electric Coal Puncher

An electrically operated coal cutter of the puncher type, that has a power consumption of but 6 kilowatts at the machine when in operation. It consists essentially of an electric motor, a gear case and a cylinder which is so arranged as to carry two pistons, all these parts being assembled in a light, compact machine, as may be noted.

The motor through suitable gearing is connected to one of the pistons, and the other piston carries the coal pick; there being no mechanical connection between the two pistons. The motor driven piston compresses air, which air then acts on the other piston, causing it to produce a blow.



This principle makes possible the production of a blow by electric motor drive, without harm to the motor. At the same time the valuable characteristics of compressed air tools are retained, inasmuch as the blow is produced by air.

Uses and Advantages

The Pneumelectric Puncher, being light, easily handled, and requiring but a small amount of power, is especially useful for driving headings or narrow rooms, or in pillars or other places where it is necessary to timber close to the face. It is particularly recommended for use in conjunction with machines of the chain cutting type in which case the wide work is done by the chain machine and the narrow and pillar work by the Pneumelectric.

Specifications and Equipment

Pneumelectric Punchers can be furnished with motors wound for the standard mine voltages of direct current or for 2 or 3 phase, 60 cycle, alternating current power. The full equipment furnished with each machine consists of controlling devices, short connecting cable, long connecting cable on reel, tools, picks, running board, trestles, machine truck, extra parts, etc.

Installation and Expert Reports

Pneumelectric Punchers are installed in practically every coal producing state in United States as well as Foreign Countries.

Our representatives are capable of making expert reports on mine conditions with reference to the use of mining machinery. All communications will receive prompt attention.

FAIRMONT MINING MACHINERY CO.

Regular Equipment.
Tipple Structures
Screens and Chutes
Loading Booms
Picking Tables
Conveyors—all types
Cable Car Hauls
Chain Car Hauls

General Offices and Works
FAIRMONT, W. VA.

TRADE MARK REGISTERED
FAIRMONT
101-20
(The Mark of Quality)

Specialties
Steel Mine Ties
R. R. Car Retarders
Portable—
Electric Mine Pumps
Power Coal Augers
Box Car Loaders
Mine Car Trucks

COAL MINE EQUIPMENTS

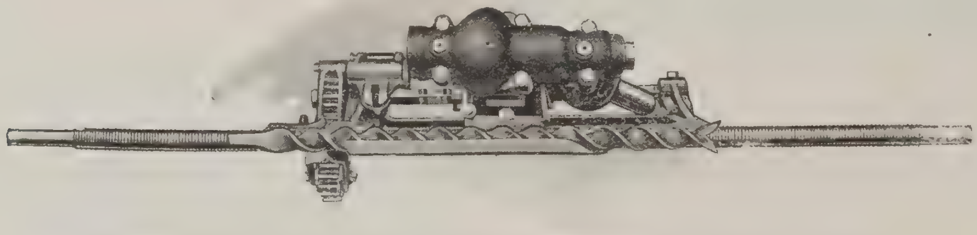
FAIRMONT Power Coal Auger

Can be used on all standard makes of Short Wall and Breast Mining Machines.

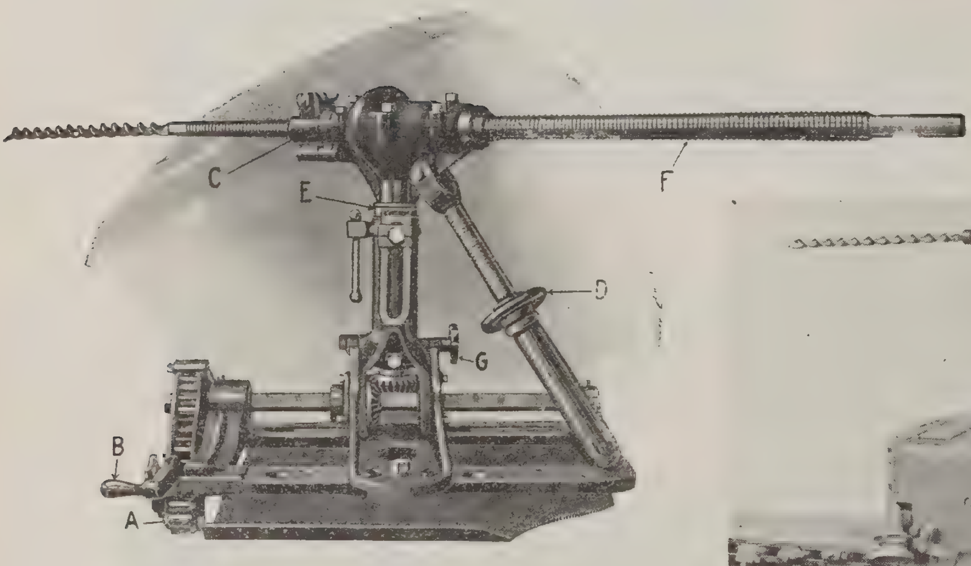
Let the machine runner do your drilling and increase the output of each machine by getting more coal for every cut.

When machine runner does drilling you can use cheaper labor for loaders.

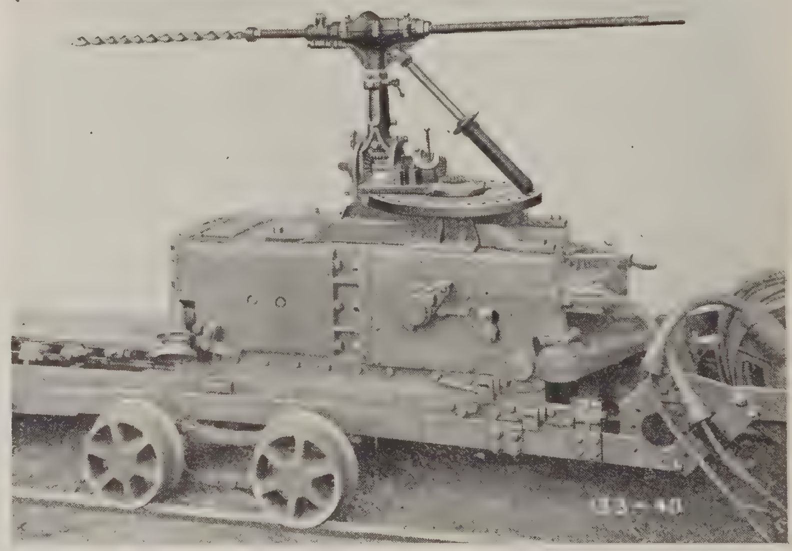
Drill holes straight or at any angle.



Showing how Auger lays flat on Machine for moving from room to room.



Auger complete unmounted.



Auger mounted on Mining Machine.

A—Pinion that connects with armature pinion of machine motor.

B—Lever for throwing machine in and out of gear.

C—Threaded Box for operating thread bar "F."

D—Wheel for adjusting Auger head to different angels.

E—Clamp ring for adjusting height of head.

F—Thread bar for turning bit which is inserted in end of bar.

G—Hand clamp for clamping head in any position desired.

IF YOU USE CHAIN MACHINES YOU CANNOT AFFORD TO BE WITHOUT IT.
Write for prices and Free Trial Offer.

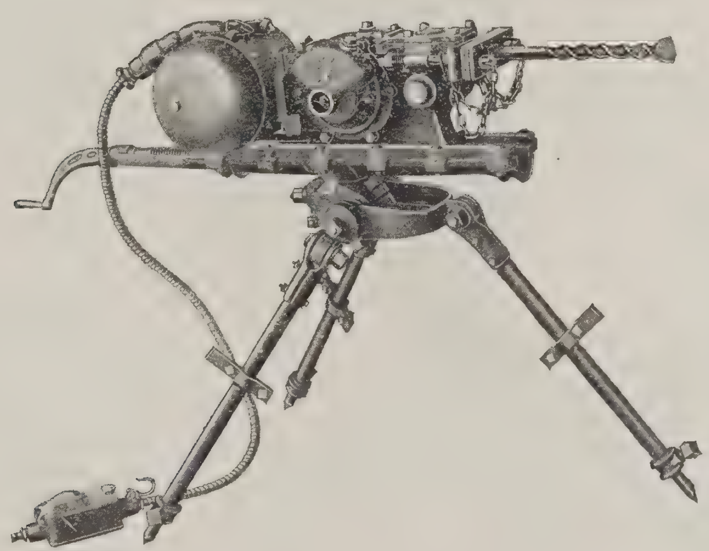
GENERAL ELECTRIC COMPANY

Fort Wayne Dept.
Fort Wayne, Ind,

The Guarantee on Goods of Excellence Electrical

Sales Offices
In All Large Cities

Electrical Supplies for Mines---Rock Drills



Fort Wayne Electric Rock Drill.

The Fort Wayne Electric Rock Drill is of the rotary hammer design operated by an electric motor attached to the frame of the drill.

The mechanism consists of two parts, a revolving helve containing the hammers and the chuck mechanism for holding and rotating the steel.

The revolving helve or striking mechanism is connected by a special endless belt to driving motor, a hand lever adjustment of belt tension giving desired variations of speed. As the helve revolves the hammers are thrown outward by centrifugal force into striking position so that at every revolution of the helve each of the two hammers delivers a blow to the drill steel cap which in turn transmits the energy of the hammer blow to the drill steel.

With the hammer helve driven at its normal speed of 850 r. p. m., 1700 hammer blows per minute are delivered to the drill steel. Spring steel buffer plates, arranged to absorb the energy of the hammer blows when drill steel is being introduced or backed out of a hole, assist in giving a vibrating motion to the drill steel which overcomes all tendency of the steel to stick.

The drill steel is rotated slowly as it is struck by the hammers. This rotation increases the rate of cutting and causes the auger shaped drill steel to automatically elevate the cuttings from the hole, no matter in what direction the hole may be drilled.

Both the drill and the motor are of simple design and rigid construction. The ball and roller bearings, packed with grease, will not fail under the heaviest duty which may be put upon them; they require the attention of the operator only once each month to repack them with grease.

The motors used have been developed especially for the service. They are fully enclosed and splash-proof and may, therefore, be operated in damp or wet locations. Direct current motors of 115, 230 and 550 volts or alternating current motors, 25 and 60 cycle, 2 and 3-phase, of 110, 220 and 440 volts can be furnished. The scheme of mounting the motor is such that one motor can be removed and another substituted in a few minutes' time without removing drill from its mounting.

The drill can be used on tripod, column, shaft bar, gadder post or quarry bar. Our tripods and columns are particularly designed for the drill, but we can furnish mountings that will adapt the drill to use on other makes of tripods or drill columns.

This Rock Drill will put in holes up to 12 feet in depth finishing 1½ inch diameter. In some classes of work holes of greater depth can be driven.

Two men can easily handle this Rock Drill. It is entirely self contained, operates from the electric distribution system in use throughout the mine and will stand up under the rough usage usually given to Rock Drills.

Established 1878

Howells Mining Drill Co.

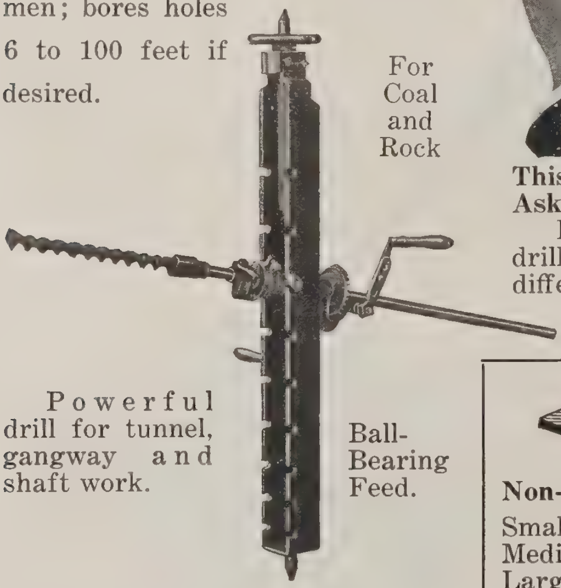
Main Office and Works:
PLYMOUTH, PA., U. S. A
Manufacturers of **Mining Machines** Of Every Known Description
Operated by Hand, Compressed Air or Electricity

TRADE MARK "REG. U.S. PAT. OFF."

TRADE MARK "REG. U.S. PAT. OFF."

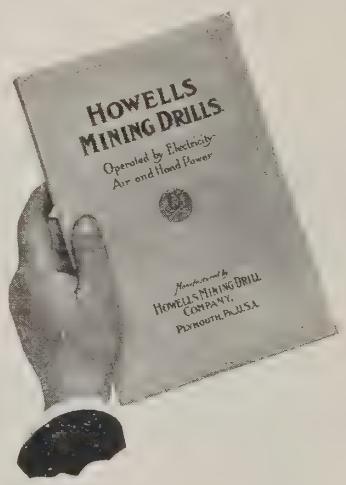
Heavy Geared Post Drill

The strongest ball-bearing hand-power drill manufactured. Bores all kinds of coal, slate, shale, medium rock, sulphur, etc.; post easily adjusted; steel feed bar; also made with driving bar and ratchet; gearing to withstand the strength of two or four men; bores holes 6 to 100 feet if desired.



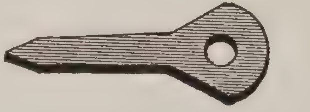
Powerful drill for tunnel, gangway and shaft work.

Ball-Bearing Feed.


HOWELLS MINING DRILLS
Operated by Electricity Air and Hand Power
Manufactured by Howells Mining Drill Company, Plymouth, Pa., U.S.A.

This Book Is Free Ask For It

It's easy to solve the drilling problem from 40 different types of drills.



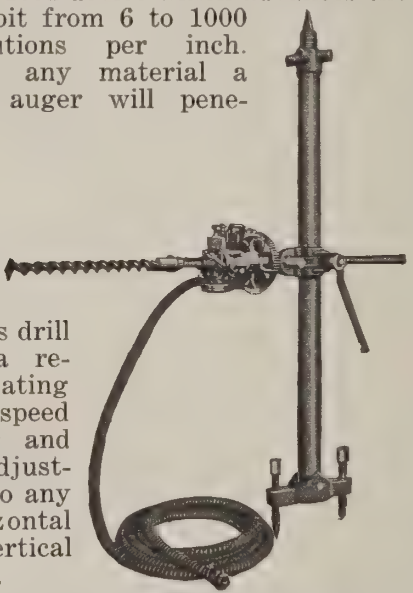
Non-Corrosive Spads

Small size.....1⅜″ long.
Medium size...1¾″ long.
Large size.......2″ long.

Made of Brass, Copper or Steel.

Compressed Air Drill

With 60 pounds pressure, bores coal 6 feet per minute; rock 2 to 3 feet; can be operated in any position; suitable for post or cross-bar; automatic feed device which advances the drill bit from 6 to 1000 revolutions per inch. Bores any material a steel auger will penetrate.



This drill has a reciprocating high-speed motor and is adjustable to any horizontal or vertical angle.

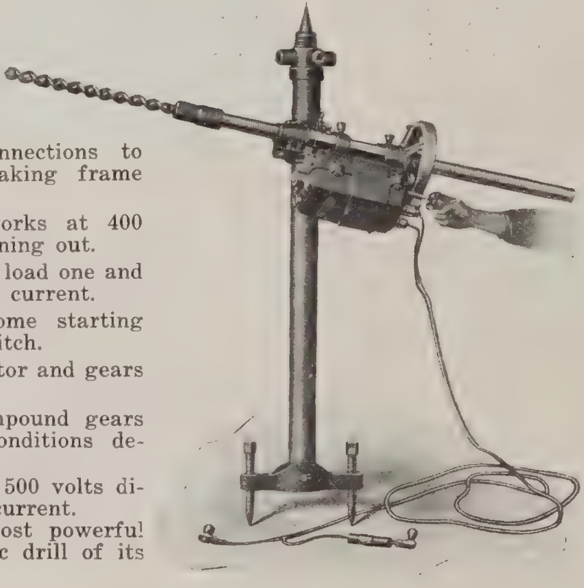
Spry Electric Drill

Points of Advantage

1. Motor carries 300% overload for short intervals and 500% momentarily.
2. No wire connections to look after when taking frame apart.
3. Armature works at 400 degrees without burning out.
4. Starts at full load one and a half times normal current.
5. No cumbersome starting box, but internal switch.
6. Weight of motor and gears 115 lbs.
7. Back or compound gears furnished where conditions demand.

Built for 110 to 500 volts direct or alternating current.

The simplest, most powerful and compact electric drill of its type.



Spry Type

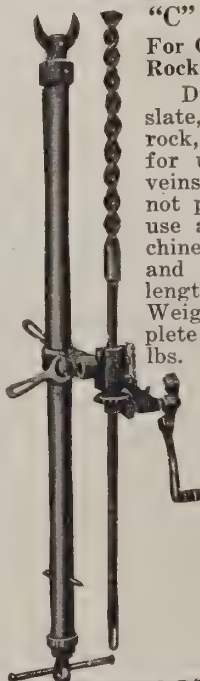
For Electric Haulage

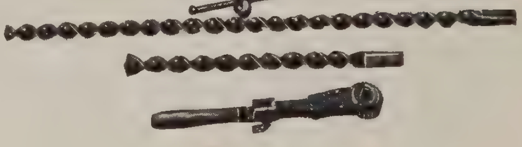
Machine in position for boring vertical holes. Will be found invaluable in connection with installation of electric haulage for drilling holes in roof and rib for insulator pegs. Built to operate at any angle.

"C" Machine

For Coal and Rock

Drills coal, slate, medium rock, etc., and for use in low veins where it is not practical to use a grip machine. Drill bits and post any length desired. Weight of complete machine 50 lbs.





The Pneumelectric Machine Company

SYRACUSE, N. Y

Pneumelectric
TRADE MARK

Electric Rock Drill

An electrically operated rock drill of the hammer type that has a power consumption of but 2.6 kilowatts, at the machine, when in operation.

It is capable of handling either hollow or solid steels and drilling either with or without water. The drill steel does not reciprocate but remains constantly in contact with the material being drilled. When hollow steels are used, water is forced through the steel by means of a small pump, thus removing the cuttings and eliminating dust. The solid steels are twisted to facilitate removal of the cuttings.

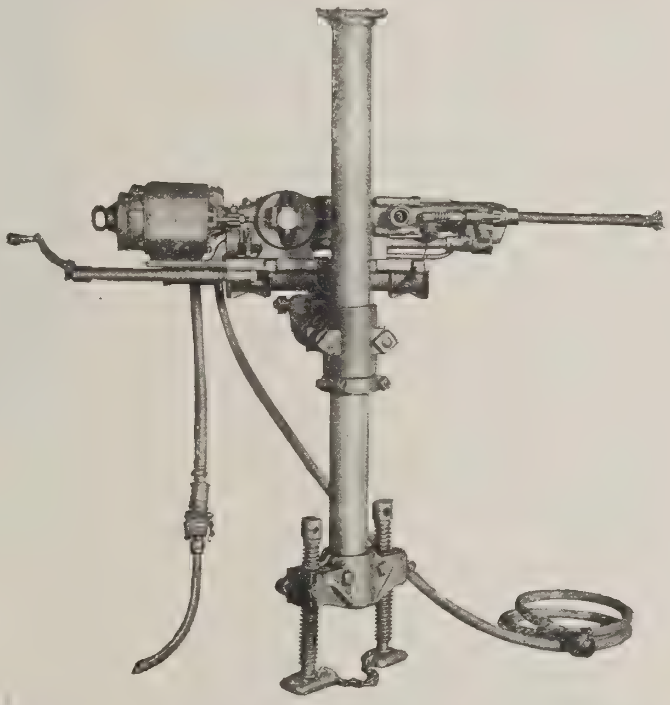
The great efficiency of this system of drilling is fully recognized and in the Pneumelectric, we offer a drill of the most efficient type capable of operating on electric power.

Uses and Advantages

The Pneumelectric Drill is well adapted to the work of drilling rock in or about coal mines and can be used on either a tripod or column.

It requires but a slight amount of power and can be operated from existing electric lines in a mine. It is light, can be handled in any practical height, and is self-contained.

An important use is in connection with coal stripping work, where the Pneumelectric is used to drill the rock overlaying the coal, also the coal itself. Ability to use water in drilling is of especial importance in this work.



Specifications and Equipment

Pneumelectric drills can be furnished with motors wound for either direct or alternating current and are regularly equipped with either a column or tripod, long connecting cable on reel, tools, wrenches, steels, extra parts, etc.

Conclusion

If you have rock to drill, no matter what character it may be, the Pneumelectric can drill it satisfactorily in every way, providing you have electric wires near enough to furnish power. We are prepared to demonstrate this and ask your investigation.

Scranton Electric Construction Co.

Office and Works SCRANTON, PA.

Manufacturers of

The Scranton Drill

Products

The Scranton Rotary Drill is steel clad and practically weather proof with only two bearings to be lubricated.

The motor is rated 2½ H. P. with 100 per cent overload capacity, wound for any direct current voltage, 110 and 250 volts standards.

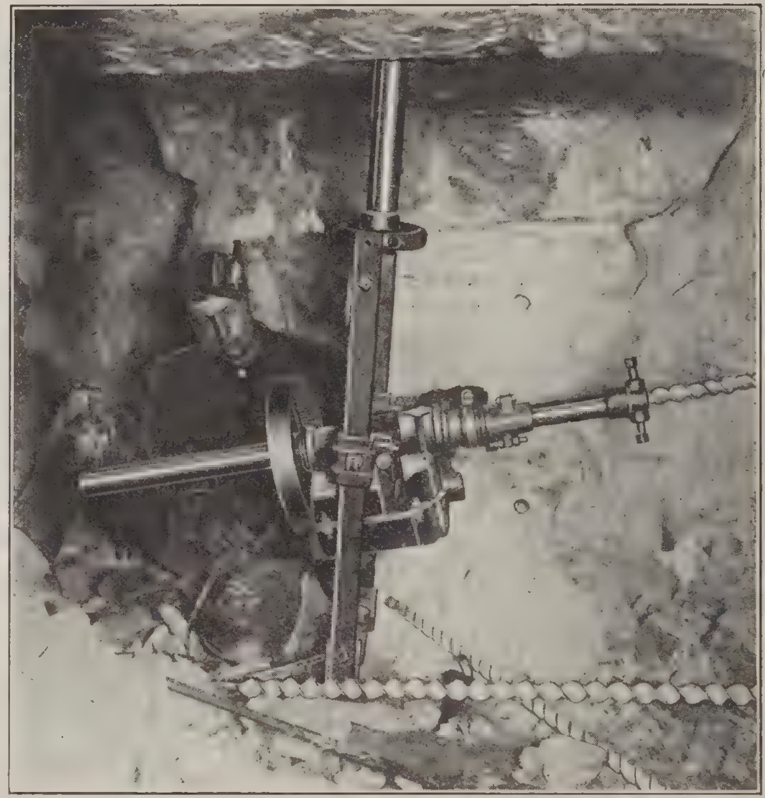
Drill body is of cast steel made in halves with pole pieces and hollow shaft bearings cast integral. These bearings are provided with removable oilless linings.

An internal machine-cut tobin bronze gear is used. This construction prevents accidents to operator and dirt accumalating in the teeth when resting on the ground.

The pinion is of carbon steel, oil treated.

The armature is so designed and proportioned that it gives maximum efficiency with minimum weight. The coils are wound in slots and the winding is so designed that under normal conditions of operation the heating is well within conservative limit, thus allowing a wide margin for heavy overload without injury or sparking.

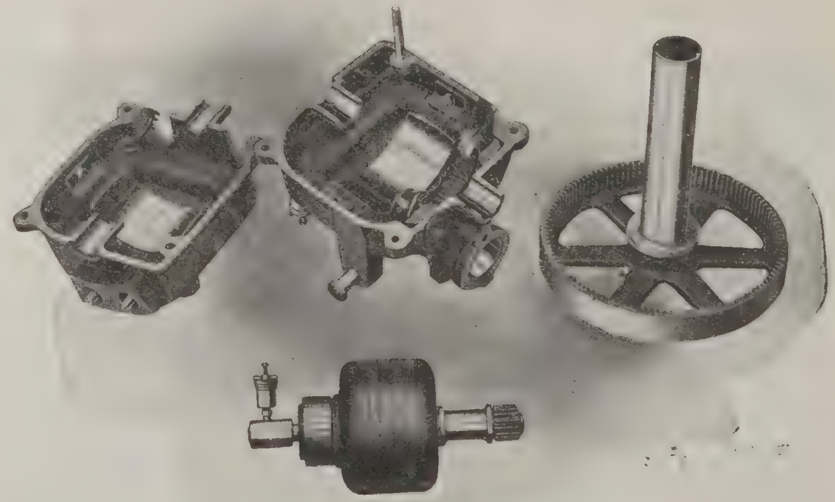
All parts are made to gauge and templet and are interchanbeable.



Showing Scranton Drill in a Low Vein of Coal.

The Scranton Drill may be used with either single or double column, according to the mine conditions. The cables are connected to the drill by means of plug switches, either one of which may be used for controlling the motor. No resistance is required for starting.

The drills are furnished with 1½ in. solid or two in. hollow feed bars with any thread from 5 to 14 as the local conditions may require. For salt and coal an 8 ft. auger passing through the center of a 5 ft. feed bar is used, the auger being held in place by means of set screws in a chuck. In harder substances solid feed bars and chucks are used, with augers of graded lengths; and for extreme cases double reduction gears are furnished.



Showing the simplicity of the Scranton Drill.

EMPIRE CHEMICAL COMPANY

HUNTINGTON, W. VA.

Manufacturers of

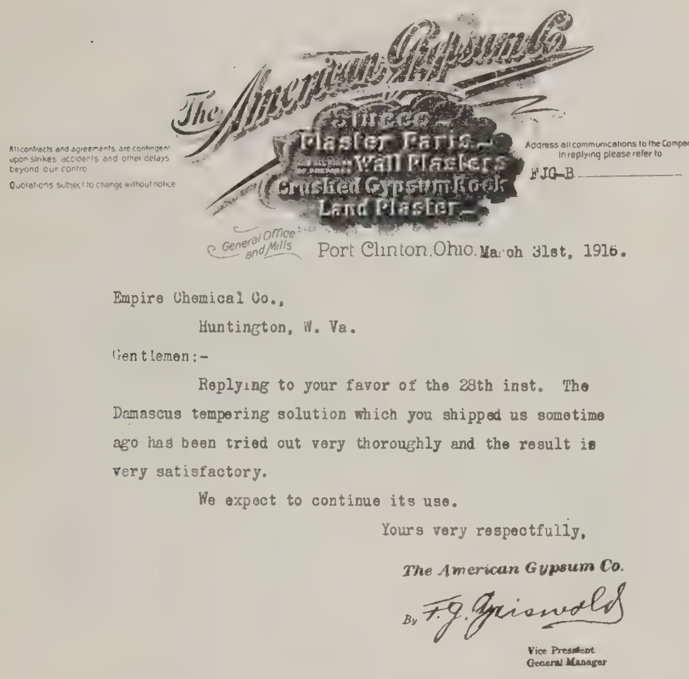
Damascus Tempering Solution

Damascus Tempering Solution will save you money in the production of your coal. The Machine Runner will not have to stop and change his cutting bits,—the Blacksmith's work will be reduced one-half when tempering picks in our solution.

Mines, Mills, Factories, and Quarries are adopting our solution daily.

References on file from every branch of the Industrial World. Shipped in barrels and half barrels under a positive guarantee.

Write us for our liberal proposition.



The American Gypsum Co.

Stucco

Plaster Paris

Wall Plasters

Crushed Gypsum Rock

Land Plaster

All contracts and agreements are contingent upon strikes, accidents and other delays beyond our control

Quotations subject to change without notice

Address all communications to the Company

In replying please refer to FJG-B

General Office and Mills Port Clinton, Ohio. March 31st, 1916.

Empire Chemical Co.,

Huntington, W. Va.

Gentlemen:-

Replying to your favor of the 28th inst. The Damascus tempering solution which you shipped us sometime ago has been tried out very thoroughly and the result is very satisfactory.

We expect to continue its use.

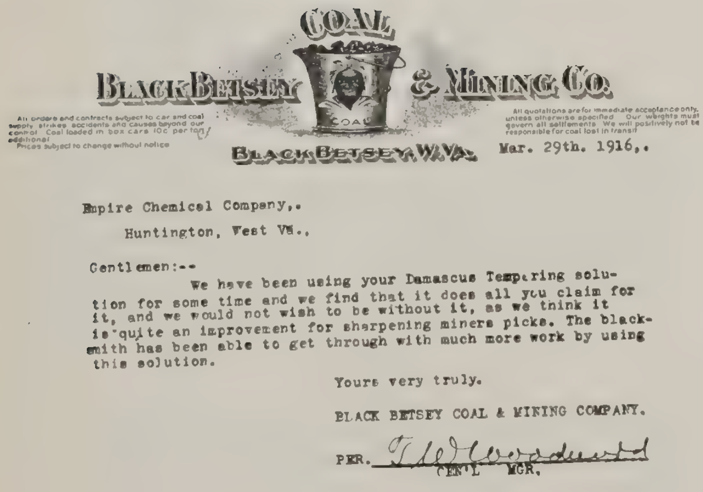
Yours very respectfully,

The American Gypsum Co.

By F. G. Griswold

Vice President

General Manager



Black Betsey Coal & Mining Co.

All orders and contracts subject to car and coal supply, strikes, accidents and causes beyond our control. Coal loaded in box cars 10c per ton additional

Prices subject to change without notice

All quotations are for immediate acceptance only, unless otherwise specified. Our weights must govern all settlements. We will positively not be responsible for coal lost in transit

Black Betsey, W. Va. Mar. 29th. 1916,.

Empire Chemical Company,

Huntington, West Va.,

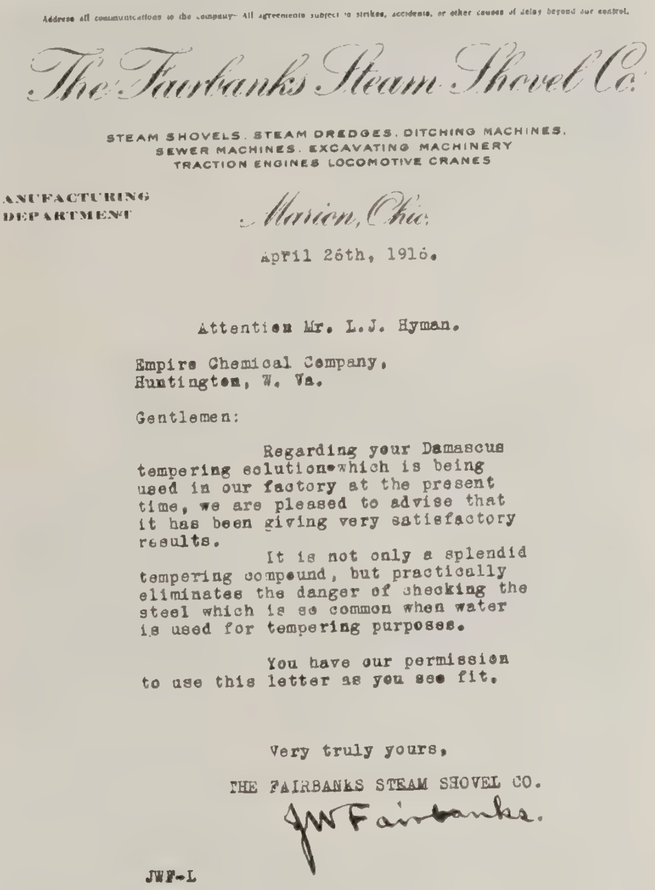
Gentlemen:--

We have been using your Damascus Tempering solution for some time and we find that it does all you claim for it, and we would not wish to be without it, as we think it is quite an improvement for sharpening miners picks. The blacksmith has been able to get through with much more work by using this solution.

Yours very truly.

BLACK BETSEY COAL & MINING COMPANY.

PER. T. W. Woodward GEN'L MGR.



Address all communications to the company. All agreements subject to strikes, accidents, or other causes of delay beyond our control.

The Fairbanks Steam Shovel Co.

STEAM SHOVELS. STEAM DREDGES. DITCHING MACHINES.
SEWER MACHINES. EXCAVATING MACHINERY
TRACTION ENGINES LOCOMOTIVE CRANES

MANUFACTURING DEPARTMENT

Marion, Ohio.

April 25th, 1916.

Attention Mr. L.J. Hyman.

Empire Chemical Company,
Huntington, W. Va.

Gentlemen:

Regarding your Damascus tempering solution which is being used in our factory at the present time, we are pleased to advise that it has been giving very satisfactory results.

It is not only a splendid tempering compound, but practically eliminates the danger of checking the steel which is so common when water is used for tempering purposes.

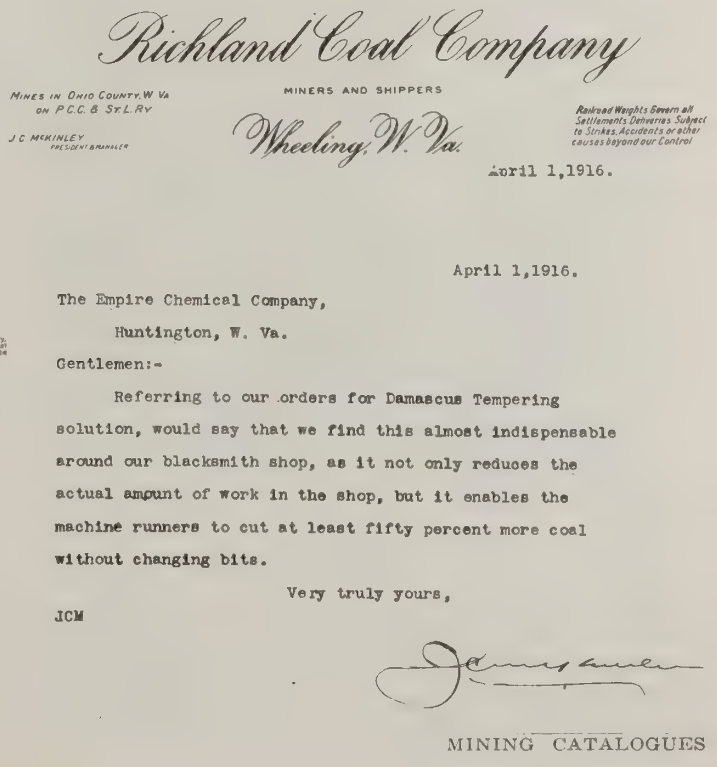
You have our permission to use this letter as you see fit.

Very truly yours,

THE FAIRBANKS STEAM SHOVEL CO.

J W Fairbanks.

JWF-L



Richland Coal Company

MINERS AND SHIPPERS

Mines in Ohio County, W. Va. on P.C.C. & St.L. Ry

J. C. McKinley President & Manager

Wheeling, W. Va.

Railroad Weights Govern all Settlements. Deliveries Subject to Strikes, Accidents or other causes beyond our Control

April 1,1916.

April 1,1916.

The Empire Chemical Company,

Huntington, W. Va.

Gentlemen:-

Referring to our orders for Damascus Tempering solution, would say that we find this almost indispensable around our blacksmith shop, as it not only reduces the actual amount of work in the shop, but it enables the machine runners to cut at least fifty percent more coal without changing bits.

Very truly yours,

JCM

Buettner & Shelburne Machine Company, Inc.

Office and Works TERRE HAUTE, IND.

Manufacturers of

Repair Parts for Coal Mining Machines

PRODUCTS

Cutter Heads, Cutter Chains, Blocks, Side Straps, Bit Set Screws, Chain Guides, Shafting, Bushings, Gears, Drive Sprockets, Rheostats, Series Coils, Field Coils, Commutators, Armature Rewinding, etc.

B. & S. Improved Cutter Heads

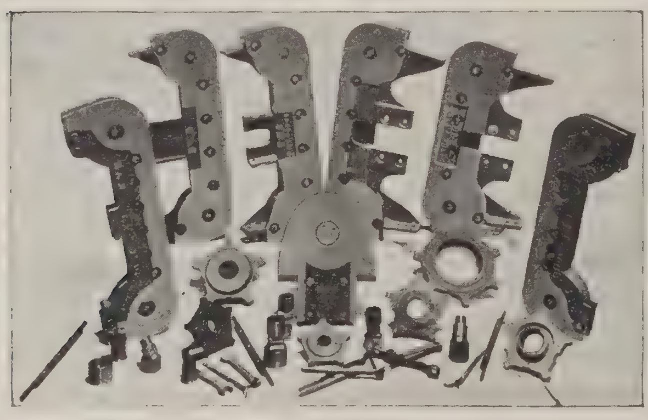
There are several points which are exclusive in our improved Cutter Heads, Patented and controlled by us.

The prime object of our invention is the provision for protecting bearing seats for the Idler Wheels employed in carrying the endless chain, which is provided with a plurality of cutting tools or bits, as in common.

Our Cutter Head is so constructed that the Idler Wheels mounted therein will have their bearings completely isolated or inclosed, whereby the wheels will always run in oil or in a perfectly lubricated condition, free from dust and grit, and consequently free from liability to become worn and deteriorated.

A felt washer is used for gasket over Idler Wheel and shoulder on Idler wheel stud. The top half of Cutter Head is fastened down on same so as to prevent dust and grit getting into oil cell.

The Cutter Head wearing bars are tool steel of proper size not to entirely fill the space between the top half and bottom half. The object in thus leaving a slight clearance between them is to compensate for expansion incident to the use of the machine, inasmuch as burrs or irregularities in the surface and edges thereof will be produced by chain traveling over same and cause the top half of Cutter Head to rise and allow dust and grit to get in oil cells of Idler Wheels.



The above illustration shows several of our Improved Cutter Heads adapted to various makes and types of mining machines. They are constructed to meet the varying conditions and are especially designed to withstand the heavy work required where the cutting is very hard. The cost of maintenance is materially decreased where our Improved Cutter Heads are installed. They are built for all types and makes of machines.

B. & S. Improved Cutter Chains

The most vital part of coal mining machines is the Cutter Chain, as the greatest strain is borne by the moving parts, and they are required to work in cuttings. The question of life at this point has been well considered.

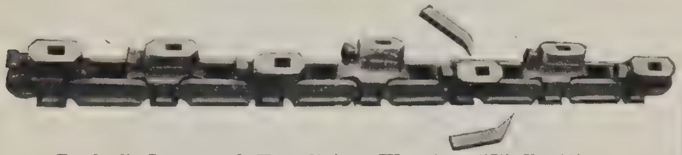
The chain blocks which carry the cutters or bits are made of cast steel and so formed and proportioned that they are capable of withstanding the severe strain brought upon them.

The side straps are drop-forged of the best material, and put through our special tempering process to insure maximum life.

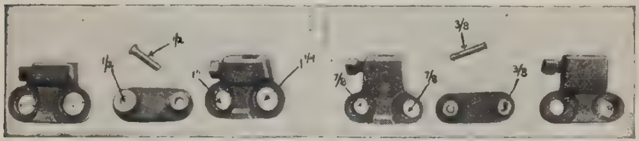
The life of the chains we manufacture exceeds that of any other yet used on this class of work.

All Cutter Chains moving in one direction will wear more on the rear hole of the Chain Block and the front boss of the Side Strap, than on the opposite holes. This is caused by being directly in front of the Drive Sprocket Tooth, which forces the Cutter Chain into motion, thereby causing a greater friction on same as the Sprocket Tooth bears against it. This is known as the tight end. However, after the Chain Block and Side Strap have passed the Drive Sprocket the loose end is formed. This is possible because the Chain Block is pushed instead of pulled.

Consequently the Cutter Chains for Mining Machines have been a serious problem and an expense to the machine owners. The Cutter Chains have been only half worn, or, in other words, the tight end was worn out, therefore the Chains have had to be discarded as they could not be used without endangering the machine, by either stripping the Chain Guides or doing other damage because of the irregularity of the openings between the Chain Block ends (caused by the wearing of the tight end) which do not properly correspond to the spacing of the teeth on the Drive Sprocket and the Idler Sprocket in the Cutter Head.

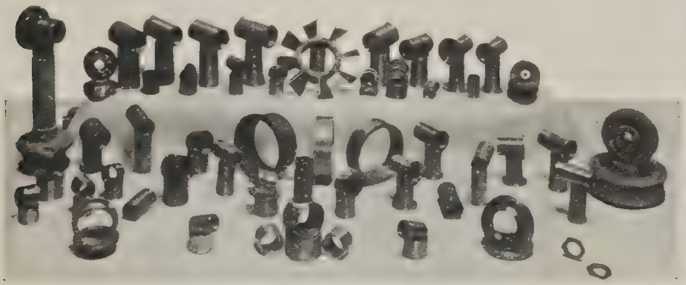


B. & S. Improved Equalizing Wearing "7" Position Cutter Chain.



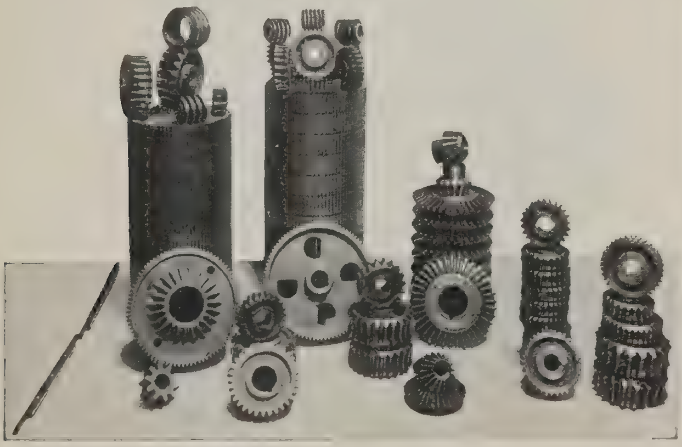
New Type and Old Type.

We have designed and are now manufacturing a Cutter Chain that will equalize the wearing of both holes of the Chain Block and also the bosses of the Side Strap, thereby producing a Cutter Chain that will stand more wear and tear than any other in the market at the present time. Furthermore, our New Improved Cutter Chain is built with half-inch rivets, so as to stand the severe usage. It is constructed of seven position Cutter Bits or Blocks, so as to proportionally distribute the cutting of each Cutter Bit, thereby releasing some of the strain on the machine and taking from 5 to 10 amperes less power.

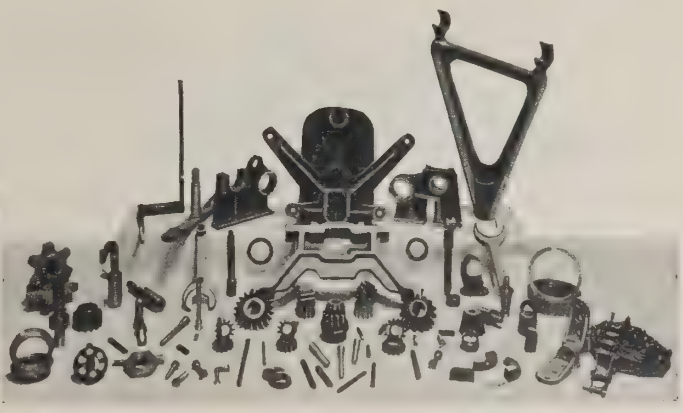


Bushings for Armatures, Drive, Feed and Clutch Shafts, Cutter Heads, Bottom and Side Frames, Trolley Wheels and Armature Hubs.

Gears and Sprockets

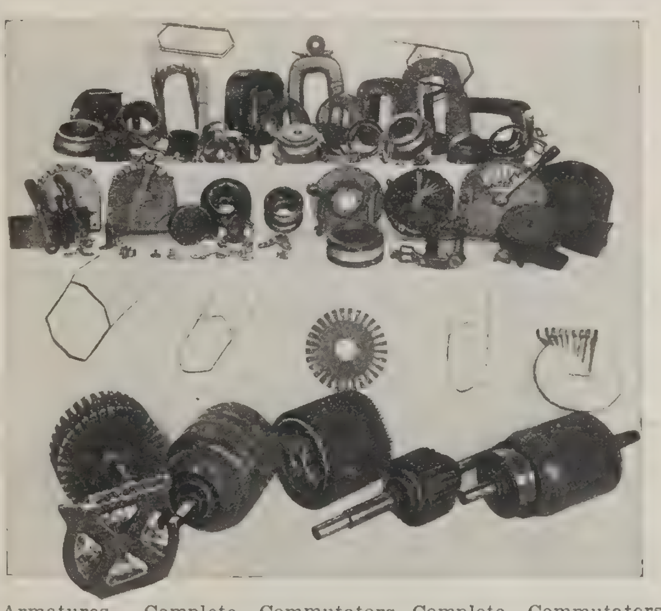


Feed, Drive, Worm, Bevel; Gears; Pinions and Worms.



Bottom Bearing Frames, Rear Jack Trusses, Side Brackets, Bevel Gears and Pinions, Front Jack Bolts, Lock Nuts, Propelling Chains, Wrenches, Tension Screws and Keys.

Armatures, Clutch, Drive, Feed and Worm Shafts, Rear and Front Jack Screws, Hand Wheels, Rear and Front Jack Pipes and Clevises.



Armatures Complete, Commutators Complete, Commutators Assembled, Mica Segments and Rings, Shunt and Series Coils, Switch Boards Complete, Rheostats; Reverse Switches, Insulating Friction Taps, Armature Coils, Contacts, Brush Holders, Carbon Brushes, etc.

Service

All our Supplies and Repair Parts are made of the best material.

Our employees are experts in their respective lines.

Having had many years of actual service in the mines we believe a practical knowledge of conditions often help a customer, and as far as possible we endeavor to give all orders our personal attention.

FRANK PROX COMPANY

TERRE HAUTE, IND.

"Everlasting Line"

Cutter Heads, Chains, Guides, Gibs, Etc.

For All Makes of Breast, Short and Long Wall Mining Machines

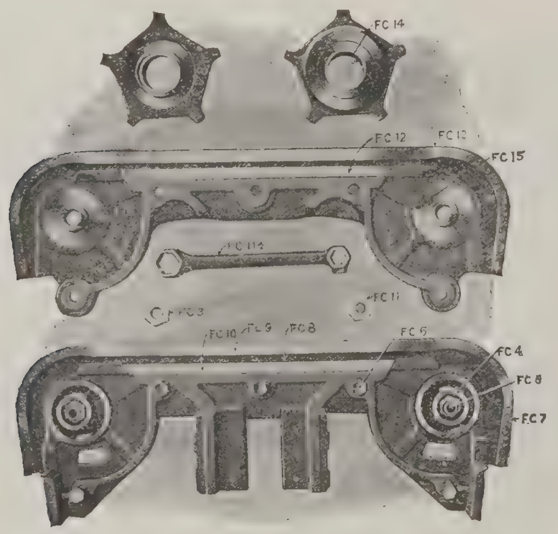
Prox-Cartlidge Short Wall Mining Machines Have All the Working Parts Enclosed and Have Forced Feed Lubrication. This Cuts Repairs to a Minimum. Send for Booklet.

Mr. Purchaser and General Manager:

Have you stopped to consider, when you throw away a cutter head, that not more than 3 per cent of its material has been worn away? But its vital features have been destroyed and the head has been rendered useless. This is not the case with our cutter head. When the parts carrying the chain have been worn away they can be replaced with new wearing strips which are drilled to fit the holes in the head exactly. It is only necessary to punch out the rivets and rivet on the new strips, which can be done by any blacksmith or mine electrician. The chain guiding elements are again renewed and the head is as good as new.

With a plant of 15 machines using a cutter head every 18 months this part of the machine would cost $483.00 per year, not considering extra parts for repairs such as front bearings, sprockets and bushings. With a full equipment of our heads we could furnish the complete set of renewable wearing surface strips for about $12.00 per set, thus effecting a saving of $303.00 per year.

Our sprockets and bearings are also more durable than any other make on account of being made of superior material and provided with a perfect system of lubrication. The front stud, when worn on one side, can be turned around and worn on the opposite side, thus doubling its life. The first head will be sent on thirty days' approval.



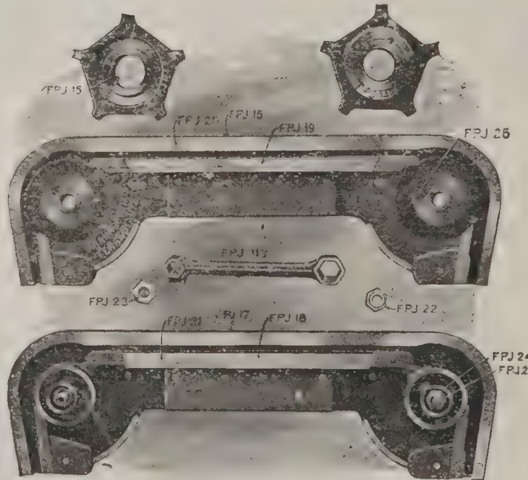
Prox Improved Cutter Head for H. D. & H. H. D. Morgan Gardner Machines.

Type F. C. 1-2 36" Cutter Head H. D. Center to Center of Sprockets 26½.

Type F. C. 3½-4½ 38 Cutter Head H. D. Center to Center of Sprockets 28".

Type F. C. 81-82 32" Cutter Head H. D. Center to Center of Sprockets 23".

Type F. C. 65-66 39" Cutter Head H. H. D. Center to Center of Sprockets 27¾".



Prox Improved Cutter Head for "Jeffrey" Machines.

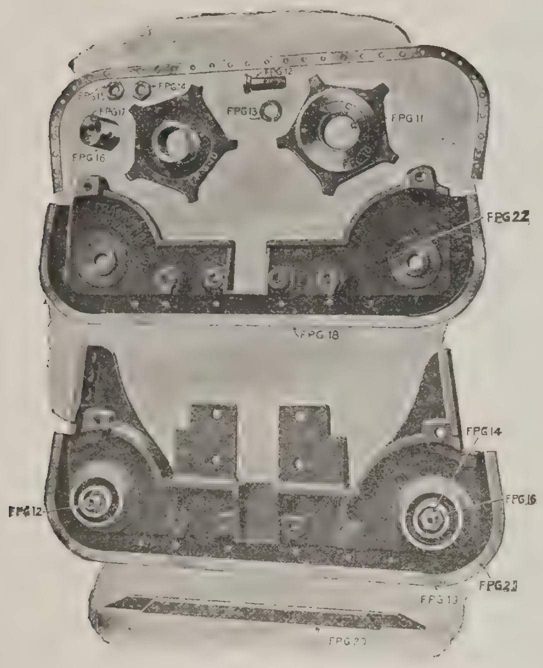
F. P. J. 13-14-19A 44 Cut No. 7 Chain.

F. P. J. 29-30-17A 44 Cut No. 7 Chain.

F. P. J. 31-32-17A 44 Cut No. 8 Chain.

F. P. J. 33-34-19A 39 Cut No. 7 Chain.

Send for Savings Account Booklet.



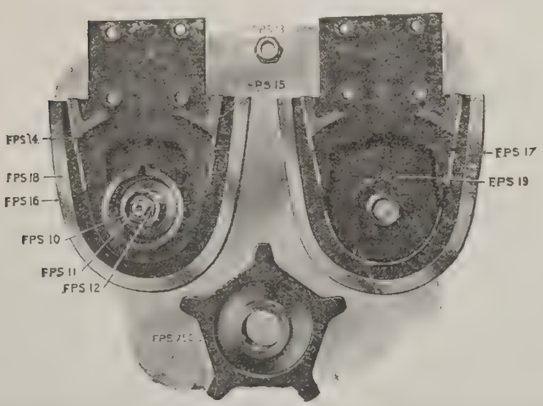
Prox Improved Cutter Head for Goodman Machines.

Type F. P. G. 1-2 42″ Cut No. 7 and 10 Chain. Center to Center of Sprocket 26″.

Type F. P. G. 3-4 44″ Cut No. 7 and 10 Chain. Center to Center of Sprocket 28″.

Type F. P. G. 57-58 42″ Cut No. 11 Chain. Center to Center of Sprocket 26¾″.

Type F. P. G. 55-56 45″ Cut No. 11 Chain. Center to Center of Sprocket 29¾″.



Prox Improved Cutter Head for "Sullivan" Type C. E. Machine.

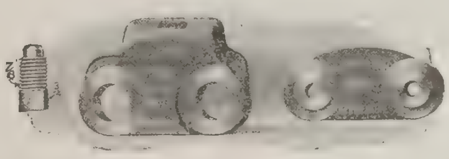
Prox Chain for use on Sullivan Machine 7 Position Type C. E. Reinforced. Hardened Wearing Surfaces.

Made Extra Strong.
5 Foot Under Cut 28 Block.
6 Foot Under Cut 33 Block.

Chain for use on Morgan-Gardner Machine, Type H. D. Reinforced. Hardened Wearing Surfaces.

"Heavy Duty" Chains to do the work must be strong. We have added to the metal of the block and side strap of this chain where needed. The operator using them never had a kick.

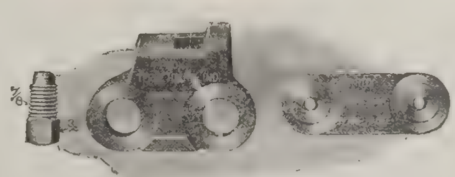
Made for H. D., H. H. D. and Short Wall Machines, Square and Keystone Bits.



Prox Chain for use on Jeffrey Machine Nos. 17 and 19A, Type 7. Reinforced. Hardened Wearing Surfaces.

This Chain is made up with the greatest care and out of the bestmaterial. The block has been reinforced (see cut) and the side strap is our trussed pattern. You can't beat it.

Made in No. 7B, No. 7C, No. 8 and Short Wall Machine.



Chains for use on Goodman Machines for Type E. Reinforced. Hardened Wearing Surfaces.

This Chain, like the others we turn out, has had special attention of our engineers and has been built up until it has now reached a degree of perfection that we never have complaints on it. Every user is a booster.

Goodman No. 7 and 10 Chain.
Goodman No. 11 Chain.
Goodman No. 12 Chain.

Guides and Gibs

We make Chain Guides for H. D. and H. H. D. Morgan-Gardner and Goodman make of machines with hardened removable wearing surfaces, and Extra Heavy Gibs for Sullivan short wall machines with hardened steel wearing surfaces. The kind that won't open up.

BERTRAND P. TRACY

32nd Street and Penn Avenue, Pittsburgh, Pa.

Manufacturer and Dealer In

Repair Parts for Coal Cutting Machines and Mine Locomotives

Supplies and Materials for Electrically Operated Coal Mines

PRODUCTS

For Machines

Shafts, Gears, Pinions.
Worms and Worm Gears,
Bronze and Graphite Bushings,
Cutter Heads, Chain Guides,
Brackets, Sprockets, Clutches
Commutators, Rheostats,
Chain Set Screws,
Studs, Screws, Bolts and Nuts
Bits and Bit Steel,
Lifting Jacks, Oilers, Shovels,
Wrenches, Carbon Brushes,
Electric Cable, Steel Cable,
Winch Rope, Etc.

For Locomotives

Steel Tires, Steel Gears,
Armature Pinions (Oil Tempered)
Armature Shafts,
Armature Shaft Bearings,
Axles,
Axle Bearings,
Commutators,
Carbon Brushes,
Trolley Wheels, Poles and Harps,
Arc Head-lights.

For the Repair Shop

Armature Coils,
Commutators,
Insulating Materials,
Mica and Mica Products
Asbestos Materials,
Insulating Tape—All kinds,
Sleeving, Twine,
Insulating Varnish, Shellac,
Babbitt Metal, Solder, Salts
Hard Fibre,
Shop Tools of every kind.

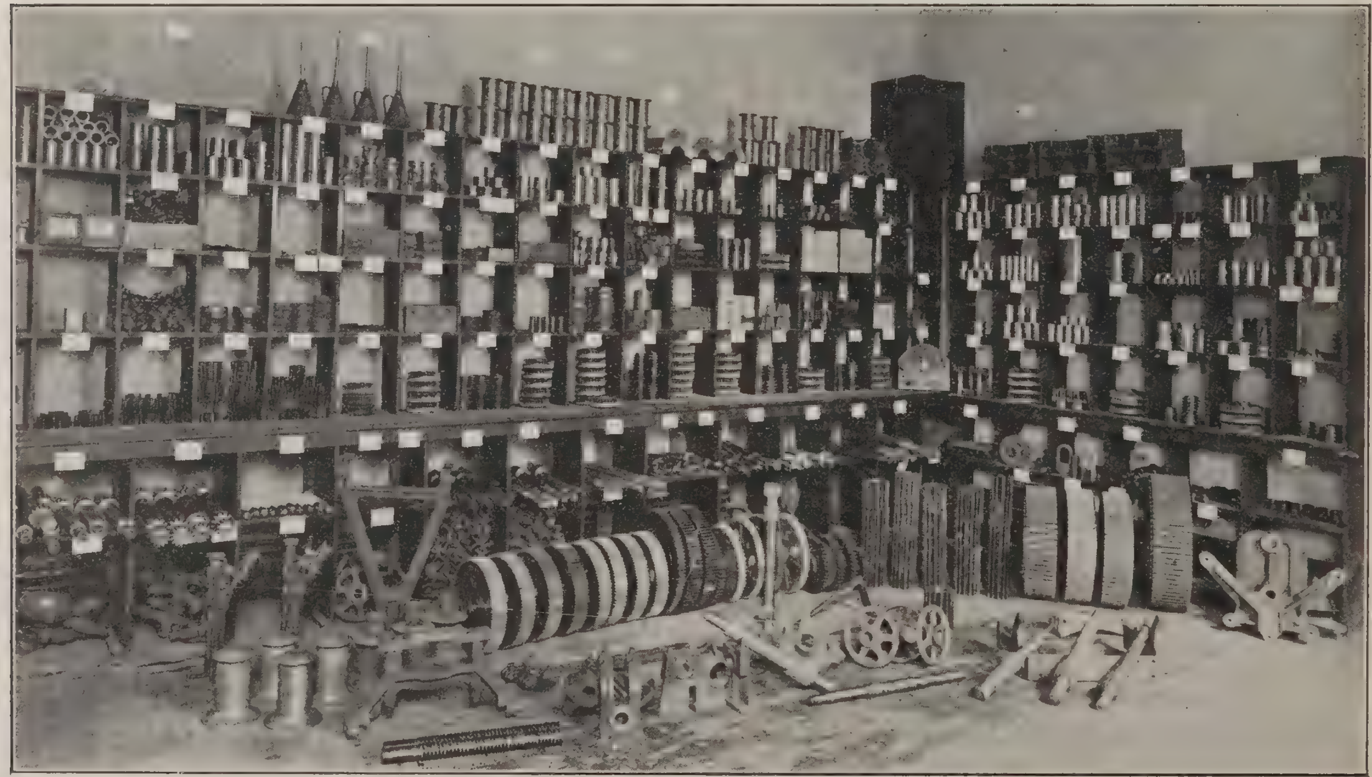
Sundries

Ammeters, Voltmeters,
Starters, Rheostats,
Circuit Breakers,
Switches, Magnetos,
Fault Finders,
Lighting Supplies,
Line Material,
Rail Drills.

SERVICE

"The Paramount Consideration"

Our knowledge of requirements, facilities and location enable us to guarantee a service that is correct in every detail. Correspondence solicited. Catalog on request.



A corner in our stock room showing a portion of over 4,000 items, we carry in stock, insuring prompt deliveries.

KEYSTONE
THE MINING CATALOG
COMBINED WITH
COAL FIELD DIRECTORY
CONSOLIDATED PUBLISHING
COMPANY INC.

ELECTRICAL SECTION

Engineering Data

Bonding—Electrical Properties of Mine Tracks.
Wiring Formulae.
Ohm's Law.
Alternating Current Formulae.
Equivalent of Electrical Units.
Current for Motors.
H. P. Formulae for Steam Engines.
Carrying Capacity of Interior Conductors.
Metric System of Weights and Measures.
Conversion Table—Kilowatts and Horse Power.
Speed and Frequency Table for A. C. Apparatus.
Formulae for Transmission Line Calculations.
Constants for Transmission Line Calculations.
Volts Lost with various Copper Wire Combinations.
Volts Drop in Bonded Track.
Properties of Stranded Copper and Aluminum Cable.
Breaking Strain of Copper and Aluminum Cable.
Resistance of Copper Cable.
Weight of Bare Copper Wire.
Diameter and Weights of Insulated Wire and Cable.

The following manufacturers have catalogue descriptions in this section:

American Steel & Wire Co.
Automatic Reclosing Circuit Breaker Co.
Calebaugh Self-Lubricating Carbon Co.
Cleveland Armature Works.
D. & W. Fuse Co.
Daum, A. F.
Dudley Elec. & Mch. Co.
Economy Fuse & Mfg. Co.
Electric Railway Equipment Co.
Electric Service Co.
Electric Service Supplies Co.
Flood City Mfg. Co.
Garton, W. R., Co.
General Electric Co.
Hazard Manufacturing Co.
Iron City Electric Co.
Jamison Rail Bond & Electrical Supply Co.
Kester Electric Co.
Le Valley-Vitae Carbon Brush Co.
McCullough, W. T., Electric Co.
Maloney Electric Co.
Monarch Refillable Fuse Co.
Ohio Brass Co.
Pittsburgh Carbon Brush Co.
Post-Glover Electric Co.
Roebling's John A., Sons Co.
Sackett Mine Supply Co.
Standard Railway Supply Co.
Stromberg-Carlson Telephone Mfg. Co.
Union Electric Co.
Western Electric Co.
Westinghouse Electric & Mfg. Co.

For additional descriptions of Electrical Equipment, not appearing in this section, refer to Index of Products in front of book.

Inquiry Data for
Electric Motors.

a. Voltage.

b. Direct or alternating current. If latter, single, two or three phase and number of cycles per second. If direct current, shunt or compound wound.

c. Is motor to be directly coupled, back geared, or belted? Maximum speed of motor. Any idler equipment.

d. Controllers:
  - d-1 Any automatic control.
  - d-2 Any remote control.

e. Are motors open or enclosed or semi-enclosed types?

CURRENT FOR MOTORS.
Amperes for Each Lead at Full Load.

HORSE POWER.	DIRECT CURRENT.		ALTERNATING CURRENT.		
			PHASE		
			Single	Two	Three
	VOLTS		VOLTS		
	110	220	208	200	200
½	4.9	2.5	4.9	...	...
1	9	4.5	7.8	...	...
1½	13.6	6.8	...	...	...
2	18	9	15.9	...	...
3	25	13	21.5	...	...
5	42	21	32.5	12.9	14.9
7½	57	28	48	19	22
10	75	38	68	25	29
15	113	57	90	37	43
20	150	75	115	49	58
30	226	113	161	72	84
40	301	150	...	96	111
50	376	188	...	118	136
60	452	226	...	140	163
70	527	263	...	163	187
80	602	301	...	185	213
90	678	339	...	207	239
100	753	376	...	230	265

WIRING FORMULÆ.

$CM = \frac{22 x LC}{V}$ Where load is at end of line.

$CM = \frac{11 x LXC}{V}$ Where load is distributed along line.

CM = Circular mils.
L = Length in feet on one side of circuit.
C = Current in Amperes.
V = Loss in volts.

Equivalents of Electrical Units.

1 Kilowatt = 1000 Watts.
1 Kilowatt = 1.34 Horse power.
1 Kilowatt = 42257 Ft.-lbs. per min.
1 Kilowatt = 56.87 B. T. U. per min.
1 Horse power = 746 Watts.
1 Horse power = 33000 Ft.-lbs. per min.
1 Horse power = 42.41 B. T. U. per min.
1 B. T. U. = 778 Foot-pounds.
1 B. T. U. = 0.2930 Watt hours.

CARRYING CAPACITY OF INTERIOR CONDUCTORS

The question of drop is not taken into consideration in these tables.

The following table shows the allowable carrying capacity of wires and cables of 98 per cent. conductivity.

The lower limit is specified for rubber covered wires to prevent gradual deterioration of the insulation by the heat of the wires, but not from fear of igniting the insulation.—"N. B. of F. U."

Copper B. & S. Gauge.	Concealed Rubber-Covered Wires.	Exposed Weatherproof Wires.
	Amperes.	Amperes.
18	3	5
16	6	8
14	12	16
12	17	23
10	24	32
8	33	46
6	46	65
5	54	77
4	65	92
3	76	110
2	90	131
1	107	156
0	127	185
00	150	220
000	177	262
0000	210	312
Circular Mils.		
200,000	200	300
300,000	270	400
400,000	330	500
500,000	390	590
600,000	450	680
700,000	500	760
800,000	550	840
900,000	600	920
1,000,000	650	1,000
1,100,000	690	1,080
1,200,000	730	1,150
1,300,000	770	1,220
1,400,000	810	1,290
1,500,000	850	1,360
1,600,000	890	1,430
1,700,000	930	1,490
1,800,000	970	1,550
1,900,000	1,010	1,610
2,000,000	1,050	1,670

(Courtesy Hazard Manufacturing Company.)

OHMS LAW.

$C = \frac{E}{R}$ $R = \frac{E}{C}$ $E = CR$

$W = EC = C^2R = \frac{R}{E^2}$

$H. P. = \frac{EC}{746} = \frac{C^2R}{746} = \frac{E^2}{R \times 746} = \frac{W}{746}$

E = Electromotiv force in volts.
R = Resistance in Ohms.
C = Current in Amperes.
W = Power in Watts.
H. P. = Horse-power.

Courtesy Randolph-Means Co

Alternating Current Formulae.

$C = \frac{W}{E \times P. F.}$ For single phase.

$C = 0.50 \times \frac{W}{E \times P. F}$ For two phase.

$C = 0.58 \times \frac{W}{E \times P. F}$ For three phase.

C = Current in line in Amperes.
W = Energy delivered in Watts.
E = Volts between mains.
P. F. = Power Factor. When power factor cannot be accurately determined it may be assumed as follows: Lighting load only .95; lighting load and motors .85; motors only .80.

BONDING

The Electrical Properties of Mine Tracks

The Electrical Resistance of any railway track depends on the material the rails are rolled from, and on the bonding of the joints.

The material is usually steel. The percentage of carbon present has a great influence on the electrical conductivity of the material. With high carbon, the resistance is sometimes as high as 13 times the resistance of copper of the same cross-section, while in some special grades of steel made for rolling into what is called the "Third Rail" on Electrical Railroads, the resistance is as low as 7 to 7½ times the copper. For mining work the common sizes are 20 to 50 lbs. per yard, in these and smaller sizes the ratio of conductivity is about 11. All calculations and data published in the following table are based on this conductivity.

The Bonding of mine tracks is as a rule very poorly done. It is difficult to provide a reliable bond for rails less than 50 lbs. per yard, because the web is of such dimensions that there is no room under the fish plates for concealing the bond and an "open bond" is always subject to injury. When a "concealed" is possible, it should be used by all means. It is poor policy to neglect the bonds after they have been installed, because the track when properly connected offers such an efficient and economical means for returning the current back to the power house. Roughly speaking, it costs only one-seventh (1-7) as much to bond a single track road, as it costs to install a copper feeder of equal capacity. The cost of maintenance is not always in favor of copper feeder. Where the top is poor and full of "drawslate" it is cheaper to keep up the bonded track.

The best kind of bond is the "All Copper Bond" with good size terminals pressed into reamed holes. The laminated or stranded bond is preferable when it can be concealed under the fishplate. When it is necessary to span the fishplates the solid wire compressed terminal bond should be used.

Cross bonding is another thing which is so often neglected. Good practice stipulates cross bonding every 200 feet.

The table following is calculated for mine tracks (single track of two rails), in which the rails are properly bonded, and the two sides cross bonded every 200 feet. The rails are mechanically connected by regular double fishplates and bolts. The length of rails is taken as 30 ft. and the resistance of each bond considered equal to 4½ ft. of rail resistance. (The Standard Electric Railway practice condemns a rail bond, which is more than 3 ft. of rail resistance.) The formulae provide, for the bond resistance and solve directly for the track and not for steel rails only, which is usually the case in textbooks and catalogues.

The resistance of the track is based on the formulae:

$\frac{A}{W} \times .2189 \times 1.15$ equals Ohms per mile.

and the copper equivalent in Cir. Mils, on the formula:

$\frac{W}{A \times 1.15} \times 253000$ equals C. M. of copper.

in which A equals 11 (Ratio of steel to copper resistance) and W equals Weight of rail in lbs. per yd.

Electrical Properties of Mine Tracks

Weights of Rail per yd.	Equivalent Area in Cir. Mils of Copper	Resistance at 24°C.		Loss in Volts per Amp. in 100 ft. Track	Safe Amp. 10°C. Rise.
		Ohms per	Ohms per 1000 ft.		
16	320000	.1737	.0329	.0033	500
20	400000	.1684	.0263	.0026	600
25	500000	.1109	.0210	.0021	675
30	600000	.0924	.0175	.0017	750
35	700000	.0792	.0150	.0015	850
40	800000	.0692	.0131	.0013	950
45	900000	.0616	.0117	.0012	1050
50	1000000	.0554	.0105	.0011	1150
55	1100000	.0504	.0095	.0010	1250
60	1200000	.0464	.0088	.0009	1300
65	1300000	.0417	.0079	.0008	1400
70	1400000	.0396	.0075	.00075	1500
80	1600000	.0345	.0065	.00065	1700
90	1800000	.0307	.0058	.00058	1900
100	2000000	.0270	.0051	.00051	2150

Calculated by Alex. Palmros Dec. '07.

Kilowatts and Horsepower

0.746 Kilowatts = 1 Horsepower

Kilowatts to Horsepower				Horsepower to Kilowatts			
Kw.	Horsepower	Kw.	Horsepower	Hp.	Kilowatts	Hp.	Kilowatts
1	1.341	55	73.733	1	.746	55	41.03
2	2.681	60	80.436	2	1.492	60	44.76
3	4.022	65	87.139	3	2.238	65	48.49
4	5.363	70	93.842	4	2.984	70	52.22
5	6.703	75	100.545	5	3.730	75	55.95
6	8.044	80	107.248	6	4.476	80	59.68
7	9.384	85	113.951	7	5.222	85	63.41
8	10.725	90	120.654	8	5.968	90	67.14
9	12.065	95	127.357	9	6.714	95	70.87
10	13.406	100	134.048	10	7.460	100	74.60
11	14.747	110	147.47	11	8.206	110	82.06
12	16.087	120	160.87	12	8.952	120	89.52
13	17.428	130	174.28	13	9.698	130	96.98
14	18.768	140	187.68	14	10.444	140	104.44
15	20.109	150	201.09	15	11.190	150	111.90
16	21.450	160	214.50	16	11.936	160	119.36
17	22.790	170	227.90	17	12.682	170	126.82
18	24.131	180	241 31	18	13.428	180	134.28
19	25.471	190	254.71	19	14.174	190	141.74
20	26.812	200	268.12	20	14.920	200	149.20
22	29.493	220	294.93	22	16.412	220	164.12
24	32 174	240	321.74	24	17.904	240	179.04
26	34.856	260	348.56	26	19.396	260	193.96
28	37.537	280	375.37	28	20.888	280	208.88
30	40.218	300	402.18	30	22.380	300	223.80
32	42.899	325	435.69	32	23.872	325	242.45
34	45 580	350	469.21	34	25.364	350	261.1
36	48.261	400	536.24	36	26.856	400	298.4
38	50.943	450	603.27	38	28.348	450	335.7
40	53.624	500	670.30	40	29.840	500	373.0
42	56.305	600	804.36	42	31.332	600	447.6
44	58.986	700	938.42	44	32.824	700	522.2
46	61.667	800	1072 48	46	34.316	800	596.8
48	64.349	900	1206.54	48	35.808	900	671.4
50	67.030	1000	1340.60	50	37.300	1000	746.0

Courtesy Goodman Mfg. Co.

Speed and Frequency Table

For A. C. Apparatus

Frequency	125 Cycles	60 Cycles	50 Cycles	40 Cycles	30 Cycles	25 Cycles
Alt. per Min.	15000	7200	6000	4800	3600	3000
POLES	SPEED					
2	7500	3600	3000	2400	1800	1500
4	3750	1800	1500	1200	900	750
6	2500	1200	1000	800	600	500
8	1875	900	750	600	450	375
10	1500	720	600	480	360	300
12	1250	600	500	400	300	250
14	1071	514	428	343	257	214
16	937½	450	375	300	225	187½
18	833⅓	400	333	266	200	167
20	750	360	300	240	180	150
22	682	327	273	218	164	136
24	625	300	250	200	150	125
26	577	277	231	185	138	115
28	536	257	214	173	129	107
30	500	240	200	160	120	100
32	469	225	187	150	113	94
34	441	212	177	141	106	88½
36	417	200	167	133	100	83½
38	395	189½	158	126	95	79
40	375	180	150	120	90	75
42	357	171	143	114	86	
44	341	163½	136	109	82	
46	326	156½	130	104	78	
48	312½	150	125	100		
50	300	144	120	96		
52	288	138½	115	92½		
54	277½	133½	111	89		
56	268	128½	107	86		
58	258½	124	103	83		
60	250	120	100	80		
62	242	116	97			
64	234⅓	112½	94			
66	227	109	91			
68	220½	106	88½			
70	214	103	86			
72	208½	100	83			
74	202½	97½	81			
76	197½	95				
78	192	92½				
80	187½	90				
82	183	88				
84	178½	86				
86	174½	84				
88	170½	82				
90	166⅔	80				
92	163	78				
94	159½	76½				
96	156	75				
98	153					
100	150					

Courtesy Crocker-Wheeler Co.

Tables

Metric System of Weights and Measures

Measures of Lengths

1 Millimeter = 0.001 Meter = 0.0394 Inch.
1 Centimeter = 0.01 Meter = 0.3937 Inch.
1 Decimeter = 0.1 Meter = 3.937 Inches.
1 Meter = 1. Meter = 39.37 Inches.
1 Dekameter = 10. Meters = 393.7 Inches.
1 Hectometer = 100. Meters = 328 Feet, 1 Inch.
1 Kilometer = 1000. Meters =3280 Feet, 10 Inches.
1 Myriameter =10000. Meters = 6.2137 Miles.

It will be noticed that 10 Millimeters equal 1 Centimeter, 10 Centimeters equal 1 Decimeter, and so on.

Measures of Volumes

1 Milliliter = 0.001 Liter = 0.061 Cubic Inch.
1 Centiliter = 0.01 Liter = 0.6102 Cubic Inch.
1 Deciliter = 0.1 Liter = 6.1022 Cubic Inches.
1 Liter = 1. Liter = 0.9081 Quart.
1 Dekaliter = 10. Liters = 9.081 Quarts.
1 Hectoliter = 100. Liters = 2 Bushels, 3.35 Pecks.
1 Kiloliter =1000. Liters = 1.308 Cubic Yards.

Weights

1 Milligramme = 0 001 Gramme = 0.0154 Grain.
1 Centigramme = 0 01 Gramme = 0.1543 Grain.
1 Decigramme = 0.1 Gramme = 1.5432 Grains.
1 Gramme = 1. Gramme = 15.432 Grains.
1 Dekagramme = 10 Grammes = 0.3527 Ounce.
1 Hectogramme = 100. Grammes = 3.5274 Ounces.
1 Kilogramme = 1000. Grammes = 2.2046 Pounds.
1 Myriagramme =10000. Grammes = 22.046 Pounds.

Metric and English Equivalents

Inches =Millimeters ÷ 25 4
Feet =Meters x 3.28083
Yards =Meters x 1.09361
Miles =Kilometers ÷ 1.60935
Sq. In.=Square Millimeters x .00155
Sq. Ft.=Square Meters x 10.7641
Acres =Square Kilometers x 247.114
Cu. In.=Cubic Centimeters ÷ 16.3870
Cu. Ft.=Cubic Meters x 35.3140

Lbs. Avoirdupois=Kilogrammes x 2.20462
Tons (2000 lbs.) =Kilogrammes ÷ 907.18
Lbs. per Foot =Kilo. per Meter x .67196
Lbs. per Cu. Ft. =Kilo. per Cu. Meter x .06243
Sq. Millimeters =Square Inches x 645.137
Sq. Meter =Square Feet x .0929
Grammes =Ounces x 28.3495
Grammes =Pounds x 453.5926
Kilogrammes =Pounds x .45359

Volts Lost with Various Copper Wire Combinations

Sizes of Wires	Area, Circular Mils.	Weight of Combination, Pounds per 1000 feet.	Volts Lost per Ampere per 1000 feet.
One No. 0000 and One No. 000	379405	1149	0 027
“ “ “ “ “ 00	344679	1044	030
“ “ “ “ “ 0	317192	960	.033
“ “ “ “ “ 1	295295	894	035
One No. 0000 and Two No. 000	547210	1657	019
“ “ “ “ “ 00	477758	1447	022
“ “ “ “ “ 0	422784	1280	.025
“ “ “ “ “ 1	378990	1148	027
One No. 000 and One No. 00	300884	911	035
“ “ “ “ “ 0	.273397	828	.038
“ “ “ “ “ 1	251500	762	041
One No. 000 and Two No. 00	433963	1314	.024
“ “ “ “ “ 0	378989	1147	.027
“ “ “ “ “ 1	335195	1015	.031
One No. 00 and One No. 0	238671	723	.043
“ “ “ “ 1	216774	656	.048
One No. 00 and Two No. 0	344263	1042	.030
“ “ “ “ “ “ 1	300469	910	.035
One No. 0 and One No. 1	189287	573	.055
One No. 0 and Two No. 1	272982	827	.038

Formulas for
Transmission Line Calculations

These formulas, and the tables of Constants on the following page are based upon a spacing of 18 inches for the wires, and results are sufficiently accurate for practical purposes with wires approximately that distance apart. Capacity has been neglected.

ALTERNATING CURRENT:

Area of conductor, circular mils $= \frac{D \times W \times K}{P \times E^2}$

Current in each conductor, amperes $= \frac{W \times T}{E}$

Loss in lines, volts $= \frac{P \times E \times M}{100}$

Weight of Copper, pounds $= \frac{D^2 \times W \times K \times A}{P \times E^2 \times 1{,}000{,}000}$

Wherein:

A = Constant (See table, opposite page)
D = Distance of transmission, one way, in feet.
E = Voltage between main conductors at receiving or consumer's end of circuit.
K For any power factor = 2160 divided by the square of that power factor, for single phase.
= 2160 divided by twice the square of that power factor, for 2-phase, 4-wire and 3-phase, 3-wire.
M = Constant (See table, next page).
P = Loss in line, in percentage of power (W) delivered to consumer.
T = Constant (See table, opposite page)
W = Total watts delivered to consumer.

Power factors for balanced circuits—

Single phase: $\frac{\text{Actual watts delivered.}}{\text{Volts} \times \text{Amperes}}$

2-phase, 4-wire: $\frac{\text{Actual Watts, Total.}}{2 \times \text{Volts} \times \text{Amperes (per phase)}}$

3-phase, 3-wire: $\frac{\text{Actual Watts, Total.}}{1.73\ \text{Volts} \times \text{Amperes (per phase)}}$

FOR DIRECT CURRENT: A = 6.04, K = 2160, M = 1, T = 1.

Volts Drop in Bonded Track

Losses Per Ampere per 1,000 Feet of Single Track

Rail Bonds of No. 1 Copper Wire

Weight of Rail, Pounds per Yard	Length of Bond, Feet	Volts Drop per Ampere per 1000 feet of Single Track			
		30-Ft. Rail Lengths		20-Ft. Rail Lengths	
		Single Bonded	Double Bonded	Single Bonded	Double Bonded
8	2½	0 0344	0.0318	0 0354	0.0317
12	2½	.0247	.0221	0261	.0224
16	2½	0198	.0172	0214	0176
20	2½	.0168	.0142	.0188	0149
25	2½	.0145	.0119	.0166	.0126
30	2½	0139	.0108	.0165	.0120
35	3	.0128	0097	.0155	.0109
40	3	0120	.0089	0148	.0101
45	3	.0114	.0083	.0142	.0096
50	3	.0109	.0078	0137	.0090
55	3	.0104	.0073	0133	.0086
60	3	.0101	.0070	.0129	.0083
65	3	.0098	.0067	.0126	.0080
70	3	.0095	.0064	.0124	.0077

Constants for
Transmission Line Calculations

Phases	Wires	Values of A	Values of K				Values of T			
			Per Cent Power Factor				Per Cent Power Factor			
			100	95	85	80	100	95	85	80
1		6.04	2160	2400	3000	3380	1.00	1.05	1.17	1.25
2	4	12.08	1080	1200	1500	1690	.50	.53	59	.62
3	3	9.06	1080	1200	1500	1690	58	61	.68	72

Wire No., B. & S. Gauge	Values of M							
	25 Cycles				60 Cycles			
	Per Cent Power Factor				Per Cent Power Factor			
	95	90	85	80	95	90	85	80
0000	1.23	1.29	1.33	1.34	1.62	1.84	1.99	2.09
000	1.18	1.22	1.24	1.24	1.49	1.66	1.77	1.95
00	1.14	1.16	1 16	1.16	1.34	1.52	1.60	1.66
0	1.10	1.11	1.10	1.09	1.31	1.40	1.46	1.49
1	1.07	1.07	1.05	1.03	1.24	1.30	1.34	1.36
2	1 05	1.04	1 02	1 00	1 18	1 23	1.25	1.26
3	1.03	1.02	1 00	1.00	1.14	1.17	1.18	1.17
4	1.02	1.00	1 00	1 00	1.11	1.12	1.11	1.10
5	1.00	1 00	1.00	1.00	1.08	1.08	1.06	1.04
6	1.00	1 00	1.00	1.00	1.05	1.04	1.02	1.00
7	1.00	1.00	1.00	1.00	1.03	1.02	1.00	1.00
8	1.00	1 00	1 00	1.00	1.02	1.00	1.00	1.00
9	1 00	1 00	1.00	1.00	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Properties of

Stranded Copper and Aluminum Cable

at 75° Fahrenheit

Conductivity: Copper 98%; Aluminum 62%

Wire No., B.&S. Gauge	Area, Circular Mils	Copper			Aluminum		
		Weight of Bare Cable, Pounds		Volts Lost per Ampere per 1000 Feet	Weight of Bare Cable, Pounds		Volts Lost per Ampere per 1000 Feet
		Per 1000 Feet	Per Mile		Per 1000 Feet	Per Mile	
	1000000	3050	16104	0.0105	920	4858	0.0166
	950000	2898	15299	.0111	874	4617	.0175
	900000	2745	14494	.0117	828	4374	.0185
	850000	2593	13688	.0124	782	4131	.0196
	800000	2440	12883	.0131	736	3888	.0207
	750000	2288	12078	.0140	690	3645	.0221
	700000	2135	11273	.0150	644	3402	.0237
	650000	1983	10468	.0162	598	3159	.0256
	600000	1830	9662	.0175	552	2916	.0276
	550000	1678	8857	.0191	506	2673	.0302
	500000	1525	8052	.0210	460	2430	.0332
	450000	1373	7247	0234	414	2187	0370
	400000	1220	6442	.0263	368	1944	.0416
	350000	1068	5636	.0300	322	1701	.0474
	300000	915	4831	.0350	276	1458	.0553
	250000	762	4026	0420	230	1215	.0664
0000	211600	645	3405	.0497	194.7	1028	.0785
000	167805	513	2709	.0625	154.4	816	.0987
00	133079	406	2144	.0789	122.4	647	1247
0	105592	322	1700	0995	97.1	513	1573
1	83695	255	1346	.1258	77.0	407	1988
2	66373	203	1072	.1579	61.0	323	.2495
3	52634	160	845	.2004	48.5	256	3168
4	41743	127	671	2525	38.5	203	3990
5	33102	103	544	.3112	30.2	161	.4920
6	26251	81	428	.3960	24.1	128	.6260

Breaking Strain of

Copper and Aluminum Wire and Cable

Ultimate strength of Annealed Copper taken at 34,000 pounds per square inch.

Ultimate strength of Hard Drawn Copper taken at 60,000 pounds per square inch, except: 50,000 pounds for Nos. 0000, 000 and 00, 55,000 pounds for No 0, 57,000 pounds for No. 1.

Ultimate strength of Aluminum taken at 26,000 pounds per square inch.

Table gives actual breaking strains, to which a suitable safety factor must be applied to secure proper working strengths.

Wire No., B. & S. Gauge	Area, Circular Mils	Breaking Strain, Pounds			
		Copper, Solid		Aluminum	
		Annealed	Hard Drawn	Solid	Stranded
	1000000	...	...	20420	32280
	900000	...	...	18380	29050
	800000	...	...	16340	25820
	700000	...	...	14300	22590
	600000	...	...	12250	19370
	500000	...	...	10210	16140
	400000	...	...	8170	12910
	300000	...	...	6130	9680
	250000	...	...	5110	8070
0000	211600	5650	8310	4320	6830
000	167805	4475	6580	3430	5420
00	133079	3550	5226	2720	4290
0	105592	2800	4558	2150	3410
1	83695	2225	3746	1710	2700
2	66373	1775	3127	1355	2143
3	52634	1400	2480	1075	1700
4	41743	1115	1967	852	1350
5	33102	885	1519	657	1070
6	26251	700	1237	536	850
7	20817	550	980	426	...
8	16510	440	778	337	...
9	13094	350	617	267	...
10	10382	275	489	212	...
11	8234	220	388	167	...
12	6230	175	307	133	...
13	5178	135	244	105	...
14	4107	110	193	84	...

Weight of

Bare Copper Wire

Wire No., B. & S. Gauge	Diameter, Inches	Area, Circular Mils	Weight of Bare Wire, Pounds	
			Per 1000 Feet	Per Mile
0000	0.460	211600	640.7	3383
000	.410	167805	508.1	2683
00	365	133079	403.0	2128
0	325	105592	319.7	1688
1	.289	83695	253.4	1338
2	.258	66373	201.0	1061
3	.229	52634	159.4	841.5
4	204	41743	126.4	667.4
5	.182	33102	100.2	529.2
6	.162	26251	79.5	419.7
7	144	20817	63.0	332.8
8	.129	16510	50.0	264.0
9	.114	13094	39.7	209.4
10	.102	10382	31.4	166.0
11	.091	8234	24.9	131.7
12	.081	6230	19.8	104.4
13	.072	5178	15.7	82.8
14	.064	4107	12.4	65.7
15	.057	3257	9.86	52.07
16	.051	2583	7.82	41.29
17	.045	2048	6.20	32.75
18	.040	1624	4.92	25.97
19	.036	1288	3.90	20.59
20	032	1021	3.09	16.33
21	.029	810.1	2.45	12.95
22	.025	642.5	1.95	10.27
23	.023	509.5	1.54	8.15
24	.020	404.0	1.22	6.46
25	.018	320.4	.97	5.12
26	.016	254.1	.77	4.06

Resistance of

Copper and Aluminum Wire

at 75° Fahrenheit

Conductivity: Copper 98%; Aluminum 62%.

Wire No., B.&S. Gauge	Area, Circular Mils	Copper			Aluminum		
		Volts Lost per Ampere		Feet per Ohm	Volts Lost per Ampere		Feet per Ohm
		Per 1000 Feet	Per Mile		Per 1000 Feet	Per Mile	
0000	211600	0.049	0.259	20393	0.078	0.410	12888.9
000	167805	.062	.327	16172	.098	.517	10236.9
00	133079	.078	.412	12825	.123	.652	8118.5
0	105592	.098	.519	10176	.155	.822	6441.7
1	83695	.124	.655	8066	.196	1.036	5105.8
2	66373	.156	.825	6396.7	.247	1.306	4049.1
3	52634	.197	1.04	5072.5	.311	1.646	2546.5
4	41743	.249	1.31	4022.9	.393	2.075	3210.9
5	33102	.314	1.66	3190.2	.496	2.620	2019.4
6	26251	.395	2.09	2529.9	625	3.305	1601.4
7	20817	.499	2.63	2006.2	.789	4.173	1269.9
8	16510	.629	3.32	1591.1	.994	5.255	1007.2
9	13094	.792	4.18	1262.0	1.253	6.627	798.8
10	10382	1.00	5.28	1000.5	1.580	8.360	633.3
11	8234	1.26	6.65	793.6	1.990	10.53	502.32
12	6230	1.59	8.39	629.3	2.513	13.29	398.35
13	5178	2.00	10.58	499.1	3.167	16.75	315.90
14	4107	2.53	13.34	395.8	3.992	21.10	250.54
15	3257	3.19	16.82	313.9	5.035	26.66	198.68
16	2583	4.02	21.21	248.9	6.345	33.55	157.55
17	2048	5.07	26.75	197.4	8.013	42.30	124.95
18	1624	6.39	33.73	156.5	10.11	53.40	99.09
19	1288	8.06	42.53	124.1	12.73	67.25	78.58
20	1021	10.16	53.64	98.44	16.07	85.06	62.31
21	810.1	12.81	67.63	78.07	20.25	107.1	49.42
22	642.5	16.15	85.27	61.92	25.53	134.9	39.20
23	509.5	20.37	107.5	49.10	32.20	170.3	31.08
24	404.0	25.68	135.6	38.94	40.65	214.8	24.65
25	320.4	32.38	171.0	30.88	51.23	271.0	19.55
26	254.1	40.84	215.6	24.49	64.65	341.8	15 50

Courtesy Goodman Mfg. Co.

Diameter and Weight of

Standard Weatherproof Insulated Copper Wire and Cable

Triple Braid

Wire No., B. & S. Gauge	Area, Circular Mils	Solid		Stranded	
		Diameter, Inches	Weight, Pounds per 1000 Feet	Diameter Inches	Weight, Pounds per 1000 Feet
	1000000	....	....	1.45	3674
	900000	....	....	1.39	3332
	800000	....	....	1 33	2992
	700000	....	....	1.27	2650
	600000	....	....	1.19	2235
	500000	....	....	1.11	1894
	400000	....	....	1.02	1553
	300000	....	....	.93	1174
0000	211600	0.66	767	.79	800
000	167805	.60	629	.73	653
00	133079	.55	502	66	522
0	105592	.51	407	61	424
1	83695	.45	316	.52	328
2	66373	.40	260	.44	270
3	52634	.37	208	.41	219
4	41743	.35	164	.38	170
5	33102	.32	130	.35	146
6	26251	.30	112	.33	115

Diameter and Weight of

Standard Weatherproof Insulated Copper Wire and Cable

Double Braid

Wire No., B. & S. Gauge	Area, Circular Mils	Solid		Stranded	
		Diameter, Inches	Weight, Pounds per 1000 Feet	Diameter, Inches	Weight, Pounds per 1000 Feet
	1000000	....	....	1.37	3456
	900000	....	....	1.31	3127
	800000	....	....	1.24	2799
	700000	....	....	1.18	2471
	600000	....	....	1.11	2093
	500000	....	....	1.03	1765
	400000	....	....	.94	1436
	300000	....	....	.85	1083
0000	211600	0.61	723	.71	745
000	167805	.56	587	.65	604
00	133079	.52	467	.60	482
0	105592	.47	377	.56	388
1	83695	.41	294	.47	303
2	66373	.37	239	.42	246
3	52634	.35	185	.38	190
4	41743	.32	151	.35	155
5	33102	.30	122	.32	126
6	26251	.28	100	.31	103

Diameter and Weight of

Rubber Insulated Copper Wire and Cable

National Electric Code Standard. 0 to 600 Volts

Triple Braid

Wire No., B. & S. Gauge	Area, Circular Mils	Solid		Stranded	
		Diameter, Inches	Weight, Pounds per 1000 Feet	Diameter, Inches	Weight, Pounds per 1000 Feet
	1000000	....	....	1.54	3637
	900000	....	....	1.48	3304
	800000	....	....	1.42	2968
	700000	....	....	1.35	2631
	600000	....	....	1.28	2290
	500000	....	....	1.17	1906
	400000	....	....	1.09	1573
	300000	....	....	.99	1226
0000	211600	0.78	835	.85	879
000	167805	.73	685	.79	719
00	133079	.69	564	.74	595
0	105592	.65	474	.70	494
1	83695	.61	395	.66	412
2	66373	.51	297	.59	324
3	52634	.48	247	.52	260
4	41743	.46	208	.49	218
5	33102	.41	167	.46	184
6	26251	.39	142	.41	149

Diameter and Weight of

Rubber Insulated Copper Wire and Cable

National Electric Code Standard. 0 to 600 Volts

Double Braid

Wire No., B. & S. Gauge	Area, Circular Mils	Solid		Stranded	
		Diameter, Inches	Weight, Pounds per 1000 Feet	Diameter, Inches	Weight, Pounds per 1000 Feet
	1000000	....	....	1.46	3553
	900000	....	....	1.40	3223
	800000	....	....	1.33	2891
	700000	....	....	1.27	2557
	600000	....	....	1.19	2220
	500000	....	....	1.09	1842
	400000	....	....	1.00	1514
	300000	....	....	.90	1173
0000	211600	0.70	793	.77	833
000	167805	.65	646	.71	675
00	133079	.61	528	.66	556
0	105592	.57	439	.61	457
1	83695	.53	363	.57	37.7
2	66373	.45	276	.50	293
3	52634	.42	228	.45	238
4	41743	.39	190	.42	198
5	33102	.36	154	.40	166
6	26251	.34	130	.36	136
7	20817	.30	105	.32	108
8	16510	.27	82.1	.29	85 5
9	13094	.26	68.4	.27	70 0
10	10382	.25	58.1	.26	60 6
11	8234	.24	50.0	.25	52 3
12	6230	.23	43 1	24	44 9
13	5178	.22	38.5	.23	39 6
14	4107	.21	33.0	.22	34.3

Courtesy Goodman Mfg. Co.

AMERICAN STEEL & WIRE CO.

Sales Offices

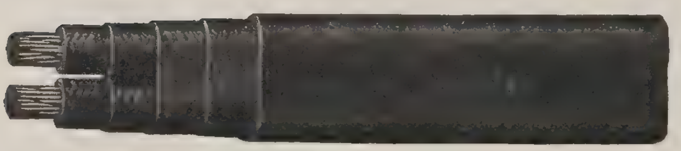
CHICAGO.......208 So. La Salle Street
NEW YORK.......30 Church Street
WORCESTER.......94 Grove Street
BOSTON.......120 Franklin Street
PHILADELPHIA.......Widener Building
PITTSBURGH.......Frick Building
BUFFALO.......337 Washington Street
DETROIT.......Foot of First Street
CINCINNATI.......Union Trust Building
CLEVELAND.......Western Reserve Building
BALTIMORE.......32 So. Charles Street
WILKESBARRE, PA.......Miners Bank Building
ST. LOUIS.......3d National Bank Building
ST. PAUL-MINNEAPOLIS..Pioneer Bldg., St. Paul
OKLAHOMA CITY....State National Bank Building
BIRMINGHAM, ALA.......Brown-Marx Building
DENVER.......1st National Bank Building
SALT LAKE CITY.......Walker Bank Building

Export Representative: U. S. Steel Products Co., New York
Pacific Coast Representative: U S. Steel Products Company
San Francisco Los Angeles Portland Seattle

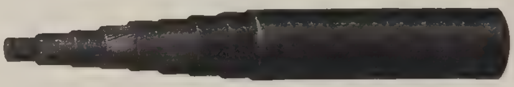
ELECTRICAL WIRES

Americore Rubber Covered Wire.

Solid Conductor Rubber Covered Lead Encased Wire.



Duplex Parallel Mining Machine Cable.

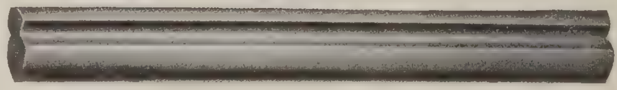


Concentric Mining Machine Cable.

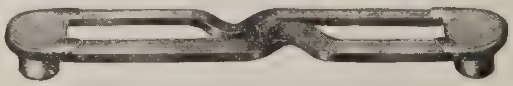
Reliance Weatherproof Cables.

Products

We manufacture bare copper wires and cables for telephone, telegraph and power transmission purposes; also insulated wires of all kinds such as weatherproof wires and cables, magnet, annunciator and office wire, lamp cord, sub-marine cables, car wires, together with all kinds of rubber covered wires and lead encased cables for interior and exterior purposes. Our mining machine cables are made with special strong braids which withstands abrasion to advantage. We also make them in a hard spun cotton braid when the usage is extra severe.



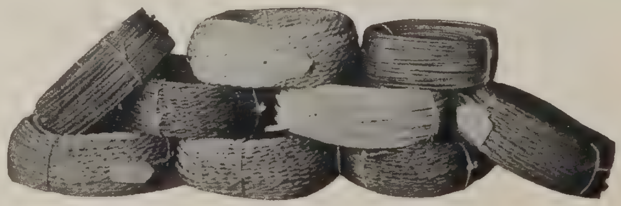
Copper Trolley Wire.



United States Rail Bond.

Stocks

Are carried with jobbers and dealers in all mining communities also in our warehouses at Chicago, New York, Pittsburgh, Buffalo, Cleveland and St. Louis.



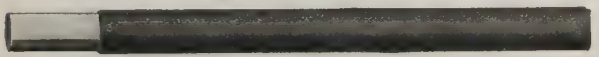
D & W FUSE COMPANY

PROVIDENCE, RHODE ISLAND

Deltabeston Wires

Prevent burnouts. Asbestos will not carbonize. Does not deteriorate. Heat-proof. Moisture-proof. Maintenance cost eliminated.

Round Magnet Wire



Covered with pure asbestos fibre in a smooth flexible mass, which will not crack or break, even when sharp bends are made. Tough, moisture-proof and indestructible under any commercial temperature.

Flat Magnet Wire

Made in a great range of sizes for bigger cross-section of copper. Its prepared asbestos, fire-proof insulation is tenacious and adheres to flat sides and rounded corners of wires, even when bent or twisted.

Fixture Wire

For installations where temperature makes rubber covered wires impracticable, this smooth, flexible, tenacious asbestos covering will give best protection and longest service.

Fixture Wire

Same construction as the above, with the addition of a silk covering over the asbestos fibre to give a neat, attractive appearance where wiring of fixtures is exposed to view. Made in single, parallel and twisted conductors.

Stove Wire

Furnishes perfect wiring for electric stoves and ranges, in and around oven and boiler rooms. Insulated with especially treated asbestos fibre and tightly braided asbestos covering.

Heater Cord

Asbestos insulated throughout; will not burn nor deteriorate like rubber. The stranded conductors are cemented together so that should some of them break they will not penetrate the wall and cause short circuit.

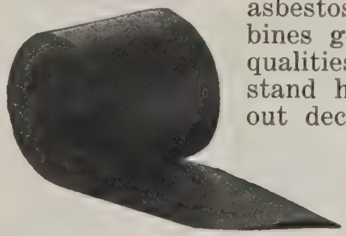
Switchboard Wire

Over the asbestos fibre wall, filled with moisture-proof compound, is braided an asbestos cover in either black or white finish. Being fireproof, it is decidedly better for switchboards than the "slow burning" wires commonly used.

Moving Picture Cable

A very flexible conductor having a wall of asbestos fibre and a braided asbestos covering; moisture-proof; widely used where wires are subjected to high temperatures—projectors, searchlights, railroad controllers, cranes, etc.

Deltatape



A heat resisting insulating material having asbestos fibre as a base. Combines good electrical insulating qualities with ability to withstand high temperatures without decomposition. Flexibility and tenacity insures facility in manipulation. Particularly adapted for insulating ribbon wound coils, for slot insulation and the like.

Write for Deltabeston Catalog No. 5 K and sample card.

Approved by the Underwriters' Laboratories, Inc.

HAZARD MANUFACTURING CO.

WILKES-BARRE, PA.

NEW YORK
533 Canal Street

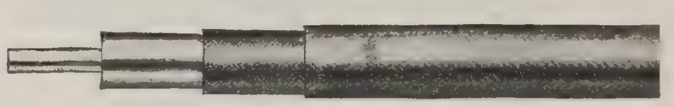
PITTSBURGH
1st Nat'l Bank Building

CHICAGO
522 W. Adams Street

INSULATED WIRES AND CABLES

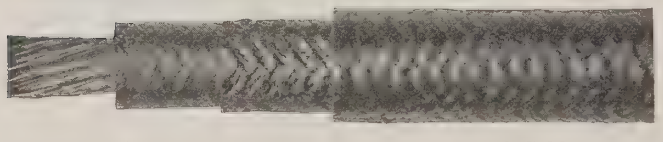
Products

Bare and Insulated Wires and Cables for Light and Power Transmission, Telephone, Telegraph, Signals, Mining Machines and Electric Locomotives.



8-B. & S. Solid. Rubber Insulation. Two Braids.

2-B. & S. Solid, Rubber Insulation, Tape and Lead.



3-B. & S. Extra Flexible Locomotive Reel Cable.

Rubber Covered Wires and Cables

For Light, Power, Telephone, Telegraph, Signals, Mining Machines and Electric Locomotives.

Weatherproof Wires and Cables

For Light and Power Transmission.

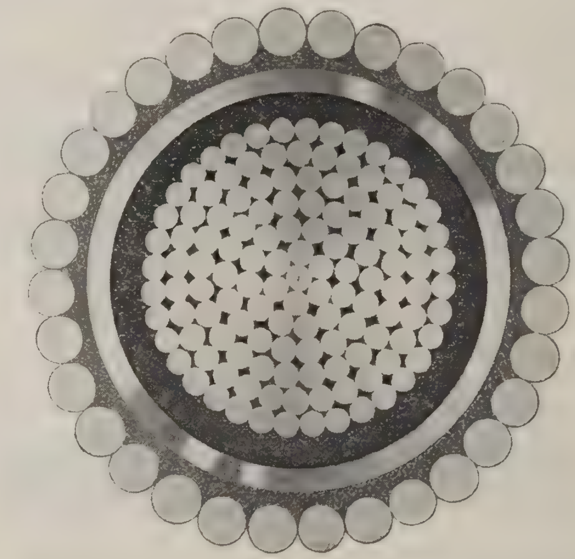
Bare Copper Wires and Cables

For Telephone and Power Transmission.

Mining Machine Cables

Made in Twin flat form or Concentric round form. The Twin flat form Cables are made with two flexible copper conductors, each covered with rubber and one cotton braid. Over these are placed two or three cotton braids and the whole is thoroughly saturated with a weatherproofing compound.

The Concentric round form cables are made with one flexible copper conductor in the center covered with rubber and tape. Over this is placed a layer of fine copper wires equivalent to the copper conductor in the center and this in turn is covered with a layer of rubber and finished with two or three cotton braids thoroughly saturated with a weatherproofing compound. Hazard Hard Service Braids recommended. Description next column.



2,000,000 C. M. Power Cable. Rubber, Lead & Armor.

Locomotive Reel Cables

Are made with a flexible copper conductor covered with rubber and finished with two or three cotton braids thoroughly saturated with a weatherproofing compound. Particular attention is paid to the finish of these cables so that they will be able to withstand the severe conditions to which they must be subjected. The outer covering may be Hazard Hard Service Braid, a braid particularly adapted to withstand the sharp cutting edges of fresh mined coal. These outer coverings are put on in such a way that they do not become loose on the rubber and pile up when running through the guides, thus stopping the reel and allowing the locomotive to run over and cut the cable. This feature tends to reduce the cost of locomotive operation.

Hazard Hard Service Braids

These braids are designed to minimize the wear on the outer coverings of portable conductors. This special hard and tough covering greatly increases the life of Mining Machine and Locomotive Cables and may be had for a slight increase of first cost.

Armored Cables

Cables for power transmission down shafts and bore holes are made to meet requirements. They may be made with protecting coverings of rubber, lead, steel armor and tarred jute. Cables thus made may be suspended in shafts and bore holes and be protected from the destructive influences of acid waters.

JOHN A. ROEBLING'S SONS CO.

TRENTON, N. J.

Also CHICAGO, PHILADELPHIA, PITTSBURGH, CLEVELAND, ATLANTA,
John A. Roebling's Sons Co., of New York, New York.
John A. Roebling's Sons Co., of California.
SAN FRANCISCO, LOS ANGELES, SEATTLE, PORTLAND, ORE.

MANUFACTURERS OF

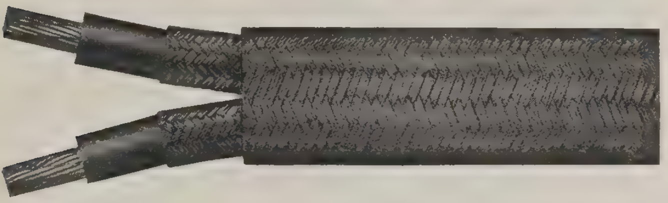
WIRE

Products

Roebling wires include iron, steel and copper wire in round, flat and special shapes. Wire for mine telephones and every kind of wire or cable needed in the electrical equipment of mines is made at the Roebling works with careful attention given to materials and workmanship.

Mining Machine Cables, Duplex

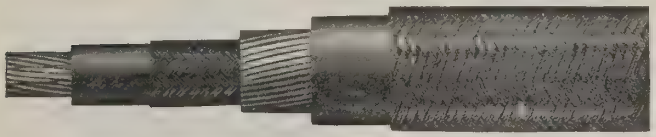
Duplex mining machine cables are made with flexible strands. The rubber insulation is N. E. C. S. thickness. Each conductor is furnished with a weatherproof braid, then laid side by side and covered with two or three braids of hard heavy cotton finished with a weatherproof compound.



Mining Machine Cables, Concentric Construction "A"

This type of cable has a flexible strand insulated with rubber 1-64″ thicker than N. E. C. S. This center is covered with a tape and braid. Fine wires are placed over the covered center, the area of the wires being equal to that of the center conductor.

A belt of rubber 1-64″ less than that on the inner conductor is then applied and the whole cable finished with a tape and a heavy double braid, weatherproofed.



Concentric Construction "B"

This is the same as construction "A" but without the outside belt of rubber.

Locomotive Cable

Locomotive cables are used to conduct current to electric locomotives in mines where the track extends beyond the trolley wire. The conductor is flexible with N. E. C. S. thickness of rubber insulation over which there are two extra heavy tough weatherproof braids.

Fireproof Wire

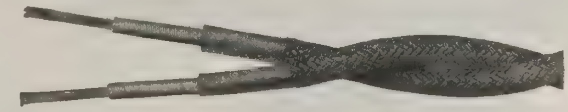
The strand of fireproof wire is flexible. The insulation is a braid of cotton, specially treated, and a finishing braid of asbestos. Both braids are heavily impregnated with our special fireproof paint.

Slow Burning Wire

The conductor of slow burning wire may be solid, stranded or flexible. The insulation is three braids of cotton thoroughly impregnated with our special fireproof paint.

Magnet Wire

We carry in stock at our works and branch warehouses a full stock of magnet wire. This includes single and double cotton covered, single and double silk covered, asbestos and single cotton covered, enameled wire, enameled and single silk and enameled and single cotton covered wires.



Brewery Cord

This cord has weather proof braids on each conductor making it suitable in all damp places for incandescent lighting.

ELECTRIC RAILWAY EQUIPMENT COMPANY

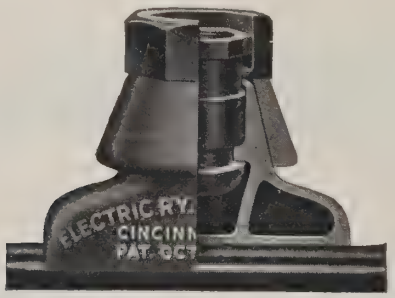
General Offices and Factory: CINCINNATI, OHIO

FACTORY REPRESENTATIVES:

PITTSBURGH, PA.: Cooke-Wilson Electric Supply Co., Penn Ave. and Barbeau St.
CHARLESTON, W. VA.: Cooke & Wilson Co.
CHICAGO, ILL.: W. R. Garton Co., 11 S. Desplaines St.
DENVER, COLO.: The O. H. Davidson Equipment Co.
BLUEFIELD, W. VA.: Superior Supply Co.
EL PASO, TEXAS: The O. H. Davidson Equipment Co.
SALT LAKE CITY, UTAH: The O. H. Davidson Equipment Co.
KNOXVILLE, TENN.: C. M. McClung & Co.
BIRMINGHAM, ALA.: McClary-Jemison Machinery Co.
NEW YORK CITY, N. Y.: J. G. Kipp, 30 Church St.
ST. LOUIS, MO.: Grayson Railway Supply Co., 405 La Salle Building.
JELLICO, TENN.: Arthur L. Ware.

Products

"Sure Grip" Trolley Clamps, "Black Diamond" Mine Hangers, Trolley Frogs, Section Insulators, Line Section Switches, complete line of Overhead Line Material.



Sectional View
Sure Grip Clamp.

The "Sure Grip" Trolley Wire Clamp was designed for Mine use and has been adopted as standard by the majority of mines in the United States. While not the cheapest clamp considering first cost alone, it has been conclusively proven by actual service to be more economical and satisfactory than any other clamp ever placed on the market.

A Few of the Good Points to Remember

(1) One operation attaches clamp to hanger and secures trolley wire in the jaws with the grip of a vise.

(2) Cut shows how all parts are locked together—impossible to have a "Sure Grip" Clamp with any part missing.

(3) Figure 8 Clamp takes all sizes of figure 8 wire—grooved clamp all sizes of grooved wire.

(4) The "Sure Grip" is installed in just one-half the time required for any other clamp.

(5) No exposed threads to be corroded by mine water, clamp can be instantly removed from hanger and used in other parts of the mine when required.

(6) Short jaws—no obstruction to trolley wheel on curves.

(7) Wide opening jaws, no difficulty to insert trolley wire which has become kinked or bent.

(8) No adjustment necessary with "Sure Grip" Clamp. Attach to hanger stud, insert trolley wire and tighten hexagon nut.

(9) If necessary to "take up" slack in trolley wire, loosen hexagon nut on "Sure Grip" Clamp one turn, wire will not drop out of clamp but is free to slip through jaws.

"Sure Grip" Trolley Clamps are furnished in malleable iron or bronze metal, also with "feed in" or strain cups instead of plain. Fully covered by patents.

Two million "Sure Grip" Clamps in actual use.

Type B. D. 1.

"Black Diamond" Mine Hangers arranged for attachment direct to mine roof or timber supports, height over all 1½ inches. Special finish insures hangers against corrosion from mine water.

Insulation absolutely impervious to mine air and moisture, and each hanger tested to 5000 Volts.

CATALOG No. 14 ON REQUEST.

Type B. D. 2.
For Expansion Bolt.

GENERAL ELECTRIC COMPANY

General Office:
Schenectady, N. Y.

The Guarantee of Excellence
on Goods Electrical

Sales Offices
In All Large Cities

Electrial Supplies for Mines

G-E Miners' Lamp

This light, compact outfit includes a lead plate storage battery with steel carrying case, and MAZDA lamp in cap reflector.

The outfit will furnish light through a solid angle of 130° for 12 hours continuous operation on each charge.

Form H.

Form H (Low).

Form A.

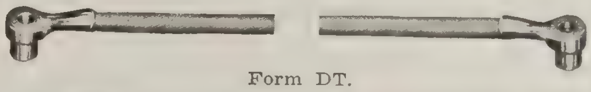
Form M.

Line Material

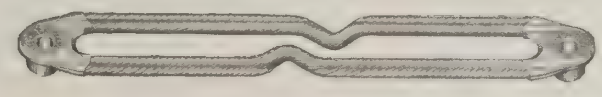
For overhead construction the strength and durability of G-E Line Material has been proved in actual service.

In strength, durability and ease of installation G-E Line Material is surpassed by none.

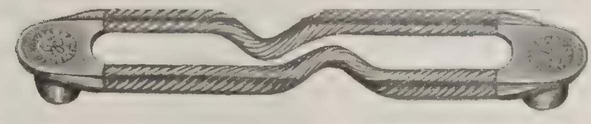
Form D.



Form DT.



Form FT-9.

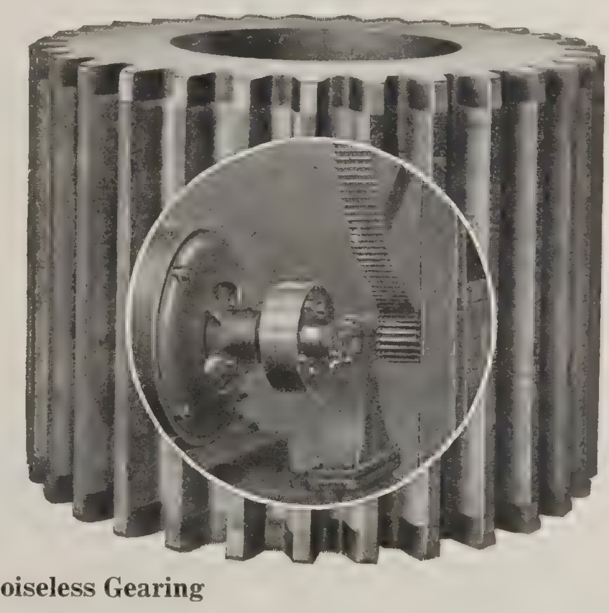


Form F-9.

G-E Railbonds

Tests in a Pennsylvania colliery showed an enormous increase in production after the installation of G-E Compressed Terminal Railbonds.

Locomotives made 18 trips per day instead of 12 as formerly with less load on the generator.



Noiseless Gearing

Fabroil Gears, are vermin proof, and oil and water proof. They do not deteriorate with age and are unaffected by atmospheric conditions.

Everything electrical for the mine is included among G-E products. Write our nearest office about your requirements.

FLOOD CITY MANUFACTURING CO.

JOHNSTOWN, PA.

Manufacturers of

Brass and Bronze Castings and Electrical Mine Equipment

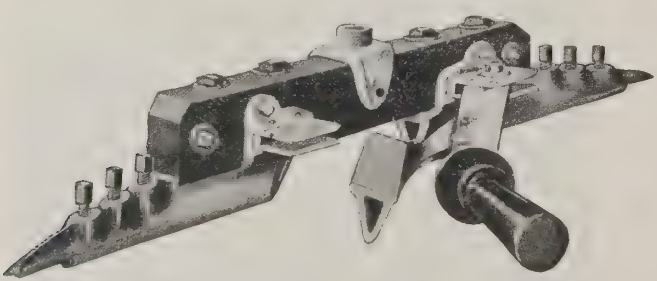
Products

We manufacture a complete line of Section Insulators. The "Diamond" Mining Trolley and Parts, Trolley Wheels, Bushings, Trolley Poles, etc. Splicers, Trolley Wire Frogs, Mine Sprinklers, Brass and Bronze Parts and Castings for Mining Machines, Electric Locomotives, Pumps and for all purposes around a mine, Acid Resisting metals for all purposes. We repair all classes of electrical and mechanical mining machinery.

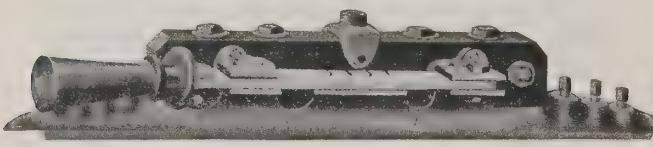
Type H H and Style D Section Insulators

On this page we illustrate two different styles of Section Insulators, which are: a combined Section Insulator and Line Switch in one. This switch is right on your trolley line and is a great cost cutter. It saves your trolley wheels, trolley line, breakers, motors and motor gears, because there is no dead section in your trolley line, just a straight, smooth, metallic underrun; no breaking and remaking the contact with a jump to injure your motors. The trolley wheels pass smoothly over.

The destructive arcing features are eliminated by using these types of switches. It stands for increased efficiency in your trolley line equipment; it is easy to install and operate; it enables you to cut out certain sections of your trolley line equipment without interruption to the whole system; it does away with the old styles Section Insulator and separate Switch. It is more efficient than both, and cheaper than either to install and maintain.



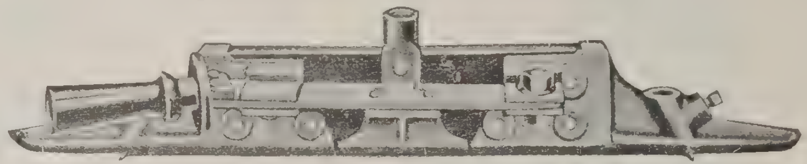
Style D, Heavy Type Section Insulator with open switch. Note complete break.



Style D, Heavy Type Insulator closed—with switch blade or "fin" in place—note the complete smooth contact.

STYLE "D" SECTION INSULATOR SWITCH

Code Word	No.	Size and Style Wire	List Price Each
Daily	543	1 and 2-0 Round or Grooved	$12.50
Dale	544	3-0 Round or Grooved	12.50
Dalle	545	4-0 Round or Grooved	12.50
Dally	546	2-0 Fig. 8 Wire	12.50
Dane	547	3-0 Fig. 8 Wire	12.50
Dado	548	4-0 Fig. 8 Wire	12.50



Type H. H. Section Insulator with switch closed—note the complete metalic underrun for wheel to pass over.

Type H H, Section Insulator with switch open, showing broken circuit in trolley line.

TYPE H H SECTION INSULATOR

Code Word	No.	Size and Style Wire	List Price Each
Rely	500	1 and 2-0 Round or Grooved	$11.00
Reliable	501	3-0 Round or Grooved	11.00
Reliance	502	4-0 Round or Grooved	11.00
Relier	503	2-0 Fig. 8 Wire	11.00
Reliant	504	3-0 Fig. 8 Wire	11.00
Relay	505	4-0 Fig. 8 Wire	11.00

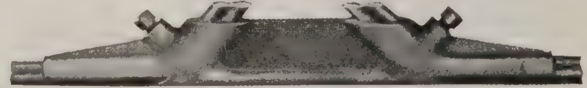
Brass and Bronze Castings

We have made a careful study of conditions around coal mines as to the needs of Brass and Bronze or Acid Resisting Metal Castings and we are prepared to furnish repair parts for mining machines, locomotives, pumps, etc.

These goods have our guarantee and meet actual mining conditions.

BRONZE TROLLEY SPLICER

With ⅜ inch Steel Set Screws on each end. Made for Round, Grooved or Figure 8 Trolley Wire.



Code Word	No.	Size and Style Wire	List Price Per 100
Able	523	1-0 Round or Grooved Wire	$80.00
Ability	524	2-0 Round or Grooved Wire	80.00
Abbey	525	3-0 Round or Grooved Wire	80.00
Abbot	526	4-0 Round or Grooved Wire	80.00
Abate	527	2-0 Figure 8 Wire	80.00
Abet	528	3-0 Figure 8 Wire	80.00
Abduce	529	4-0 Figure 8 Wire	80.00

BRONZE TROLLEY SPLICERS WITH TOP HANGERS

With ⅜ inch Steel Set Screws on each end.

Code Word	No.		List Price Per 100
Ban	530	1-0 Round or Grooved Wire	$90.00
Band	531	2-0 Round or Grooved Wire	90.00
Bandage	532	3-0 Round or Grooved Wire	90.00
Bandit	533	4-0 Round or Grooved Wire	90.00
Bandy	534	2-0 Figure 8 Wire	90.00
Bang	535	3-0 Figure 8 Wire	90.00
Bane	536	4-0 Figure 8 Wire	90.00

BRONZE TROLLEY WIRE FROGS

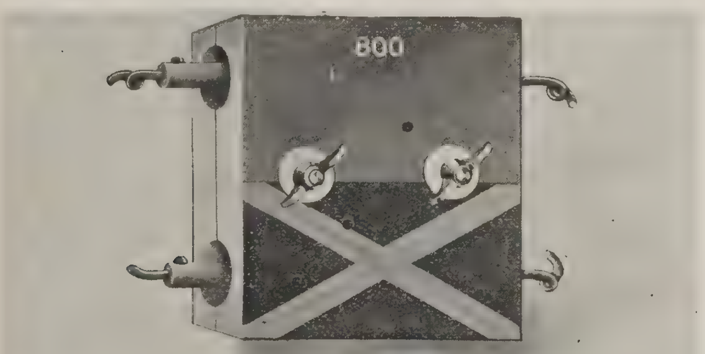
Made from a High Grade of Bronze, 20 Degrees, Right or Left Hand, for Any Size or Style Wire.

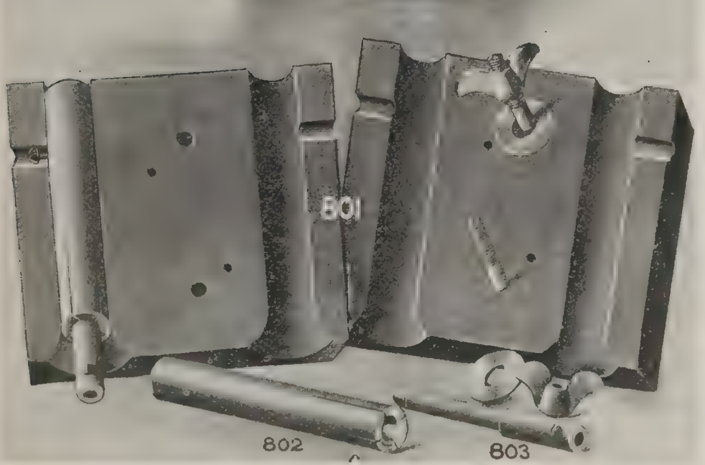
Code Word	No.	Standard Bronze Frogs, 20 Degrees	List Price Each
Dare	537	1 or 2-0 Wire, Right Hand	$4.75
Daring	538	3-0 Wire, Right Hand	4.75
Dart	539	4-0 Wire, Right Hand	4.75
Dash	540	1 or 2-0 Wire, Left Hand	4.75
Date	541	3-0 Wire, Left Hand	4.75
Daunt	542	4-0 Wire, Left Hand	4.75

Junction Blocks
will help your mining machine do its work **better, safer, quicker**—and that's why your mine should be equipped with Junction Blocks.

How They Are Installed

They are easily and securely fastened to some suitable place (usually to poles at or near the room entrances). Permanent connections are then made between the block and the line.





Why They Are Simple and Efficient

Because the mining machine operator comes along and simply plugs his machine connections into the nearest Junction Block.

They are efficient because a full and complete contact is instantly and constantly assured.

The trouble and annoyance so common with the old method of hooking the mining machine cable over the feed or trolley wire is entirely eliminated.

Though inexpensive, Junction Blocks render exceptionally efficient service and give sure satisfaction.

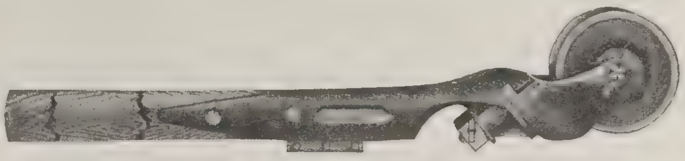
"Diamond" Mining Trolley and Parts

The "Diamond" Mining Trolley increases efficiency,—thats the advantage. Note why.

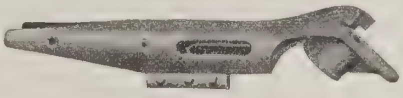
The pole head is smooth and oval backed, making nearly a straight line connection—which prevents harp or wheel catching on the trolley line. It will not wedge or catch in a frog but slides smoothly through.

Note the reinforced harp support between pole head and harp is strong—insures perfect contact and connection. It does not bend or loosen—even if the trolley leaves the wire and strikes against the roof.

We have increased the length of the cable connection. It gives a greater contact surface making a stronger and more effective connection.



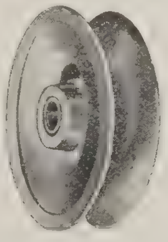
No. 506—Diamond Trolley Complete with Pole, Pole Head, Harp, Wheel and Axle Pin.



No. 508—Trolley Pole Head

No. 509—Trolley Harp

No. 510
Harp Swivel
Bolt



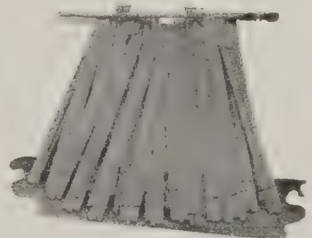
No. 512
Trolley Wheel

No. 511
Trolley Wheel Axle
Pin with Cotters

Code Word	No.	Name of Part	List Price Each
Effect	506	Diamond Trolley Complete with Pole, Polehead, Harp, Wheel and Axle Pin	$10.50
Enduce	507	Trolley Polehead and Harp Complete without Pole and Wheel	8.00
Efficient	508	Trolley Pole Head	5.10
Effort	509	Trolley Harp, less Axle Pin	2.50
Efficiency	510	Harp Swivel Bolt	.16
Efficacy	511	Trolley Wheel Axle Pin with Cotters	.24
Elligible	512	4 Inch Trolley Wheel	1.40
Empire	513	5 Inch Trolley Wheel	2.00

DIAMOND TROLLEY POLES

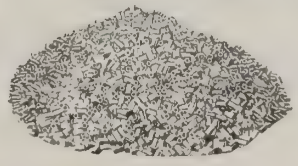
Made from selected grade of oak and ash wood. Perfectly straight, smooth, dry and free from knots.



Cat.	Size	List Pr. Ea.
549	3′10″ x 2½″ x 1¾″	.60
550	4′ x 2½″ x 1¾″	.60
551	4′06″ x 2½″ x 1¾″	.70
552	5′ x 2½″ x 1¾″	.80
553	5′06″ x 2½″ x 1¾″	.80
554	6′ x 2½″ x 1¾″	.90
555	7′ x 2½″ x 1¾″	1.00
556	8′ x 2½″ x 1¾″	1.10
557	9′ x 2½″ x 1¾″	1.40

GRAPHITE TROLLEY WHEEL BUSHINGS

Bound Brook Type.



Code Word	No.	Outside Diam.	Size of Hole	Length	List Per 100
Braze	520	⅞″	½″	1½″	$24.00
Brazen	521	1 ″	⅝″	1½″	26.00
Brazier	522	1⅛″	¾″	1½″	28.00

THE OHIO BRASS COMPANY

MANSFIELD, OHIO

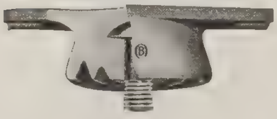
30 Church St., New York
306 Fourth Ave., Pittsburgh
343 S. Dearborn St., Chicago
Charleston Electrical Supply Co., Charleston, W. Va.

Products:

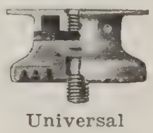
Mine trolley hangers, trolley clamps, trolley wire splicers, trolley wheels and harps, rail bonds, bonding tools, trolley frogs, trolley cross-overs, feeder wire insulators, strain insulators, high tension insulators, section insulator switches, expansion bolts, etc. These are described and listed in our General Catalog. We also make a complete line of Brass Valves and Steam Specialties listed and described in our Valve Catalog. Copies of either or both of these catalogs sent on request.

Mine Trolley Hangers

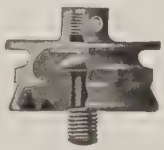
Made in various designs to meet varying service conditions.



Timber



Universal

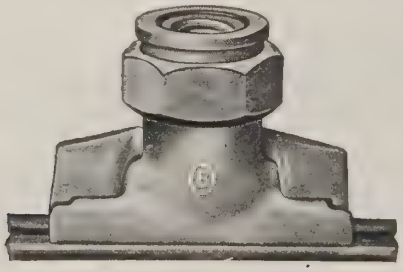


Roof

Dirigo insulation is used in these hangers. Its insulating and lasting qualities are remarkable.

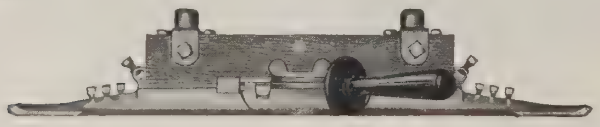
Modoc Trolley Clamp (Patented)

Easily aligned with trolley wire. Gives plenty of clearance for wheel. Grips wire firmly. Sturdy and serviceable to meet the most severe conditions. Takes round, grooved or figure 8 wire.



Mine Section Insulator Switch (Patented)

Used to cut out section of trolley wire not in use.



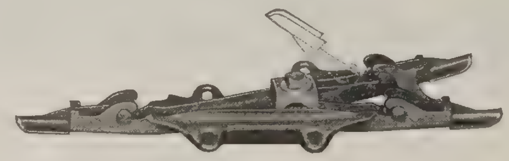
When closed it has smooth, metallic under-run Prevents sudden rush of current to motors.

Current carrying capacity is sufficient.

Opened or closed by driver when locomotive passes under.

Type D Trolley Frog (Patented)

Has only six parts including Renewable Cam Tips.



Installed easily and quickly.

Strong and sturdy for severe service.

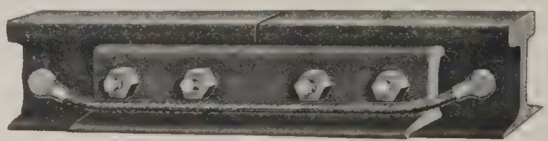
Mine Trolley Wheel and Harp

Wheel is made of high-quality bronze.

Wearing surfaces extra thick. Furnished with Bound Brook Graphite Bushings and large oil reservoir. Harp is especially designed for mining service. Pivot, set forward of the wheel axle gives trailing action, making it easy to follow irregularities in the trolley wire.

Compressed Terminal Rail Bonds.

O-B Rail Bonds make for low resistance in the return track circuit.



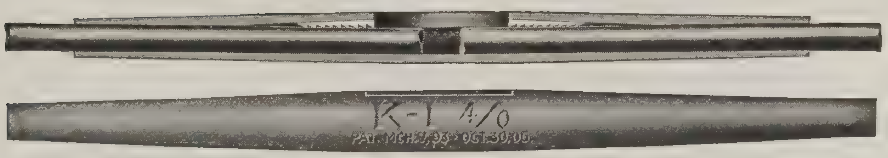
Illustrations show bond for use around splice plate. We also make bonds for under plate.

O-B Rail Bonds furnished in all sizes and capacities for every service.

STANDARD RAILWAY SUPPLY CO.

4227 Fergus St,
CINCINNATI, OHIO, U. S. A.

SPLICE IT



with the

NEW IMPROVED Trade K-I Mark SPLICING SLEVE

REG. U. S. PAT. OFF.

---

14 Points of Superiority of the "K-I."

1. Slanting bore, the paramount feautre of the new improved "K-I" splicing sleeve covered by letters patent No. 834844.

2. Light weight due to the bending down of the wire in slanting bore when in position, permitting reduction of thickness on the under side and added thickness on the upper side to reinforce the parts above the wedges.

3. Scientific formula result of twenty-three years experience in working out the best composition of metal for splicing sleeves.

4. Permanent powerful instantaneous splice through insertion of two (2) small steel wedges.

5. Distribution of pull due to the slanting bore along the entire length of the sleeve.

6. No solder necessary but can be used in addition to the wedges if desired.

7. The greater the pull on the wire the more powerful the splice.

8. No obstruction to trolley wheel.

9. On or off in a jiffy.

10. Minimum of trolley hammering.

11. Minimum of tug on cross supports.

12. Pioneer of splices constantly improved since 1893.

13. Quality highest.

14. Price lowest.

Warning! Look For the "K-I" Trade Mark.

The old "K-I" splicing sleeve was the best of its kind until the invention of the NEW IMPROVED "K-I".

The old "K-I" splicer is a thing of the past. The NEW IMPROVED "K-I" is so far superior to the old "K-I" that there is no comparison whatever. But those desiring the old "K-I" may obtain it from us in its original purity and highest quality, each sleeve bearing the "K-I" trade mark.

Don't use an old "K-I" under any circumstances unless it bears the "K-I" trade mark. If you insist on the old "K-I" get it from us with the "K-I" trade mark on it, but our advice to you is to discontinue the old "K-I" altogether, for the NEW IMPROVED "K-I" is so far superior that comparison is "odious."

Test Them At Our Risk—You Risk Nothing.

Test them first, then decide for yourself whether the NEW IMPROVED "K-I" is all we claim it to be. Tell us the size and type of the wire you are using, whether round, figure eight, or grooved. State about the length sleeve you prefer. We will send you as small a quantity as you want on trial for test and experiment. If this test and experiment does not convince you absolutely and positively that there is no splicing sleeve on the market that can even begin to compare with the NEW IMPROVED "K-I" just send them back to us at our expense, and we will refund to you all transportation charges you paid on receipt of the shipment.

Mail A Trial Order At Once.

WESTINGHOUSE ELECTRIC & M'F'G CO.

EAST PITTSBURG, PA.

WESTINGHOUSE SALES OFFICES

Atlanta, Ga.
Baltimore, Md.
Birmingham, Ala.
Bluefield, W. Va.
Boston, Mass.
Buffalo, N. Y.
Butte, Mont.
Charleston, W. Va.
Charlotte, N. C.
Chicago, Ill.
Cincinnati, Ohio.
Cleveland, Ohio.
Columbus, Ohio.
*Dallas, Tex.
Dayton, Ohio.
Denver, Colo.
Detroit, Mich.
*El Paso, Tex.
*Houston, Tex.
Indianapolis, Ind.
Joplin, Mo.
Kansas City, Mo.
Louisville, Ky.
Los Angeles, Cal.
Memphis, Tenn.
Milwaukee, Wis.
Minneapolis, Minn.
New Orleans, La.
New York, N. Y.
Omaha, Neb.
Philadelphia, Pa.
Pittsburgh, Pa.
Portland, Ore.
Rochester, N. Y.
St. Louis, Mo.
Salt Lake City, Utah.
San Francisco, Cal.
Seattle, Wash.
Syracuse, N. Y.
Toledo, Ohio.
Washington, D. C.
*W. & E. Co., of Texas.

Westinghouse Suspensions and Clamps

Westinghouse Types BF and BL Suspensions and Type RE Clamp are combined in such ways as to meet every demand for insulated trolley-wire suspension in mines.

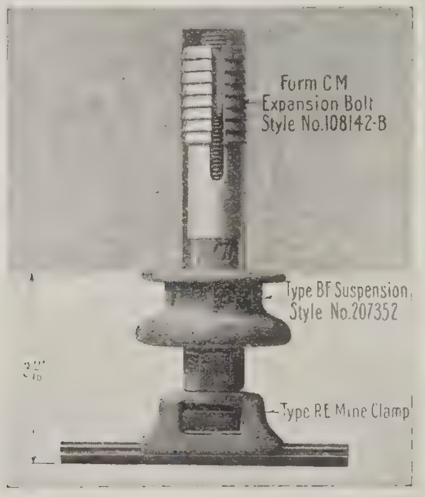


Figure 1

Type BF Suspension and Type RE Clamp, with an expansion bolt (Fig. 1), form an excellent suspension for supporting the trolley wire from the mine roof.

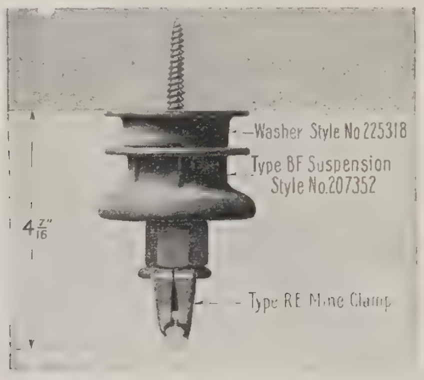


Figure 2

Type BF Suspension and Type RE Clamp, with a special washer and lag stud (Fig. 2), are used for supporting from a wooden beam or—

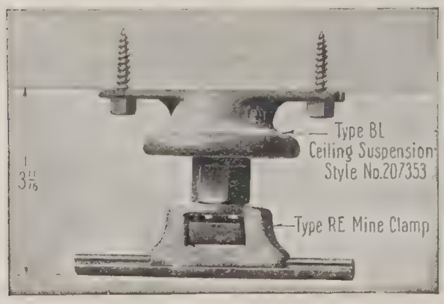


Figure 3

Type B L Suspension and Type R E Clamp and two lag bolts (Fig. 3) can be used for the same purpose and require less head room.

For supporting from vertical pipe or horizontal pipe—brackets, a combination of Type BL Suspension, Type RE Clamp, a special washer, and a vertical or horizontal pipe suspension is ideal (Figs. 4 and 5).

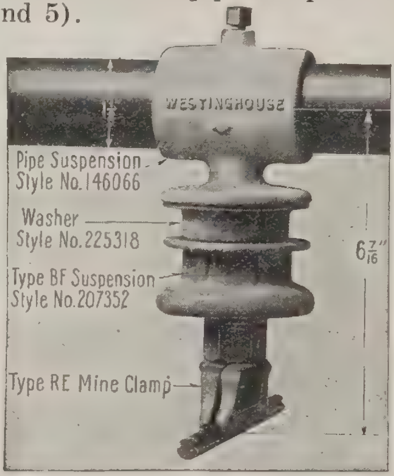


Figure 4

Mechanical Characteristics

The insulating material used in the suspensions is moisture-proof, heat resistant and of high mechanical strength. It is moulded into shape under great pressure, so that it is very dense and capable of resisting heavy strains. A vertical pull of 6,000 pounds is required to pull the stud from the moulded insulation.

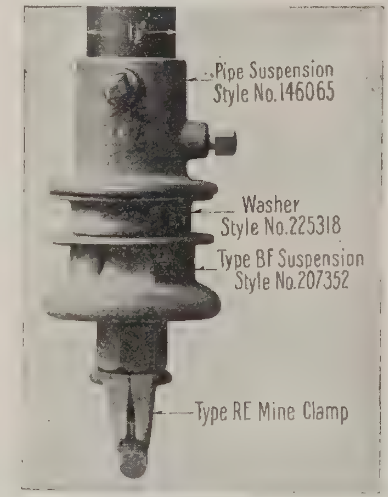


Figure 5

The average ultimate holding power of RE Clamps is 1,200 pounds side pull, 1,450 pounds vertical pull. Net weight is 11 ounces. It gives perfect wheel clearance and is made for round, grooved and Figure 8 wire.

Leaflet 3859 gives full particulars; send for a copy.

Jamison Rail Bond and Electrical Supply Co.

7078 JENKINS ARCADE BUILDING, PITTSBURGH, PA.

DISTRICT OFFICERS

New York.
Chicago, Ill.
Boston, Mass.
Cleveland, Ohio.
Los Angeles, Cal.
Salt Lake City, Utah.
New Orleans, La.
Denver, Colo.

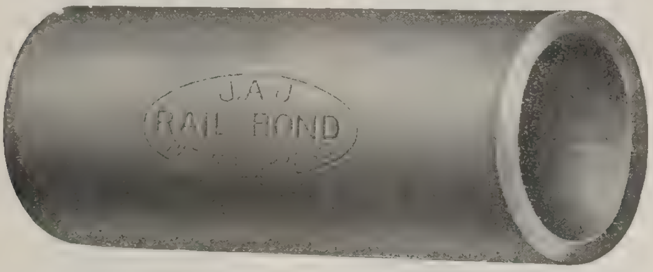
Manufacturers of

Jamison Rail Bond

The Jamison Rail Bond

The most radical improvement in BONDING devices and, at the same time, the most simple and satisfactory method is "THE JAMISON RAIL BOND," letters patent for which were granted January 31, 1911. The inventor of the JAMISON RAIL BOND is an experienced electrician and railway expert, and who is familiar with all the weak points of the various types of BONUS now used for conveying heavy currents of electricity through the rails.

Experimental work has been carried on during the past three year, and installations have been made upon various electric roads in places where the most severe conditions were to be contented with and have been found perfectly satisfactory in all cases upon investigation and tests.

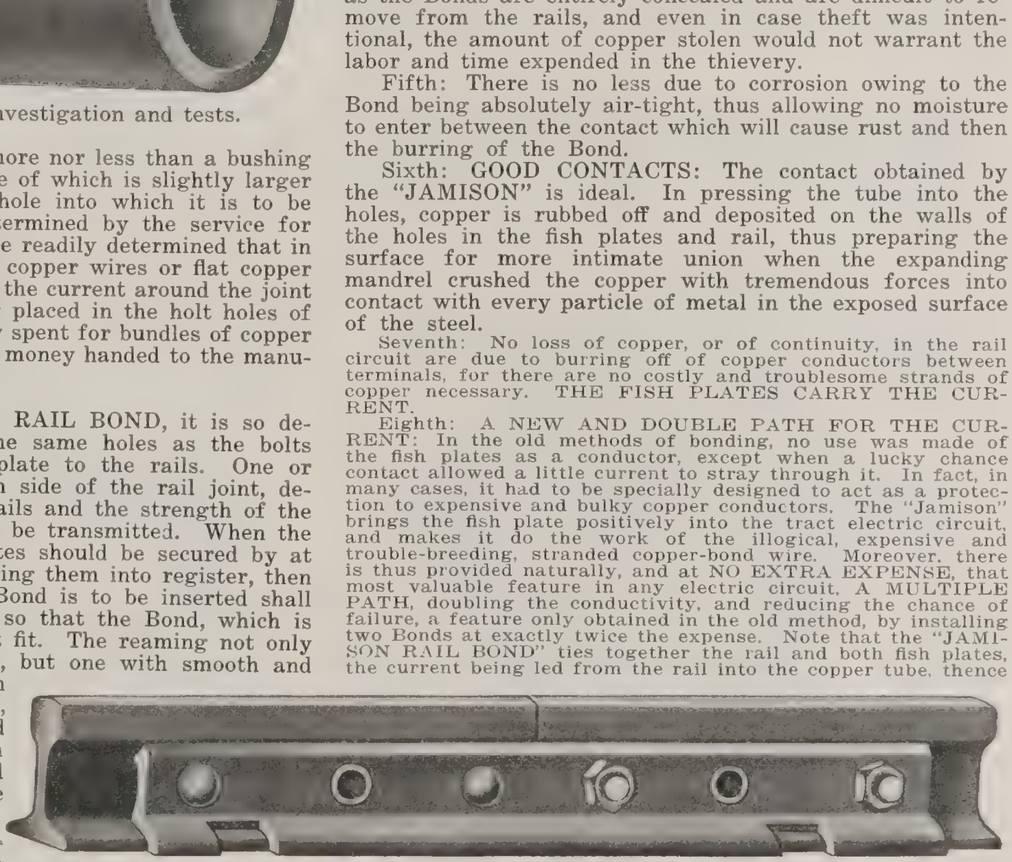


The Bond

The Bond itself is nothing more nor less than a bushing made of soft copper, the outside of which is slightly larger in diameter than the reamed hole into which it is to be placed, and which is to be determined by the service for which it is to be used. It can be readily determined that in place of the familiar bundle of copper wires or flat copper strips that the fish plate carries the current around the joint by means of these Bonds being placed in the holt holes of the rails and fish plates. Money spent for bundles of copper wires as in old-style "Bonds" is money handed to the manufacturers in "bunches."

Method of Installation

In installing the JAMISON RAIL BOND, it is so designed as to be inserted in the same holes as the bolts fastening the regulation fish plate to the rails. One or more bonds are placed on each side of the rail joint, depending upon the size of the rails and the strength of the current in amperes which is to be transmitted. When the rails are in place, the fish plates should be secured by at least one bolt in each rail to bring them into register, then the other holes, in which the Bond is to be inserted shall be reamed to the proper size, so that the Bond, which is slightly larger, shall be a tight fit. The reaming not only insures a perfectly round hole, but one with smooth and clean sides. The Bond is then inserted in the fish plate, pressed through the rail and then through the opposite fish plate. In pressing the Bond into its proper position, the holes in the rail and fish plate are copper coated, giving a copper to copper connection. A hardened steel expanding mandrel is next introduced, which, from the interior of the Bond, forces the copper into intimate contact with every particle of the surrounding steel of the rail and fish plates. In so doing the best imaginable ideal electric contact is made between the various parts, viz:—rail to Bond and Bond to fish plates. The final step is to insert and tighten up the bolts.



The Field

The field for the use of this Bond is whatever it is necessary to make a perfect contact between electrically conducting masses such as is usually done by means of bolts and clamps.

For Example:—Busbars on switchboards; portions of bridges, etc., but its greatest use may be found in the Bonding of rails of Electric Equipped Coal Mines where present methods are cumbersome, needlessly expensive, and very unsatisfactory, and it is well known to all who are familiar with this line of work. In this field alone it should effect a saving of at least 80% over the present expensive methods, i. e., in cost of material and labor, to say nothing of the enormous loss due to theft of the copper Bonds now in use.

The Advantages of the Jamison Rail Bond

First: Low in cost of the small amount of copper required.

Second: The production cost may be brought to the minimum, as the entire machining operations may be done by manufacturing automatics.

Third: The cost of installation is greatly reduced, owing to the fact that there is no soldering necessary, extra holes to drill or any riveting to be done; all that is required is to bush the holes in the fish plates and rails.

Fourth: There would be practically no less from theft, as the Bonds are entirely concealed and are difficult to remove from the rails, and even in case theft was intentional, the amount of copper stolen would not warrant the labor and time expended in the thievery.

Fifth: There is no less due to corrosion owing to the Bond being absolutely air-tight, thus allowing no moisture to enter between the contact which will cause rust and then the burring of the Bond.

Sixth: GOOD CONTACTS: The contact obtained by the "JAMISON" is ideal. In pressing the tube into the holes, copper is rubbed off and deposited on the walls of the holes in the fish plates and rail, thus preparing the surface for more intimate union when the expanding mandrel crushed the copper with tremendous forces into contact with every particle of metal in the exposed surface of the steel.

Seventh: No loss of copper, or of continuity, in the rail circuit are due to burring off of copper conductors between terminals, for there are no costly and troublesome strands of copper necessary. THE FISH PLATES CARRY THE CURRENT.

Eighth: A NEW AND DOUBLE PATH FOR THE CURRENT: In the old methods of bonding, no use was made of the fish plates as a conductor, except when a lucky chance contact allowed a little current to stray through it. In fact, in many cases, it had to be specially designed to act as a protection to expensive and bulky copper conductors. The "Jamison" brings the fish plate positively into the tract electric circuit, and makes it do the work of the illogical, expensive and trouble-breeding, stranded copper-bond wire. Moreover, there is thus provided naturally, and at NO EXTRA EXPENSE, that most valuable feature in any electric circuit, A MULTIPLE PATH, doubling the conductivity, and reducing the chance of failure, a feature only obtained in the old method, by installing two Bonds at exactly twice the expense. Note that the "JAMISON RAIL BOND" ties together the rail and both fish plates, the current being led from the rail into the copper tube, thence branching in divided or multiple circuit into each fish plate, then around the joint, and into the next succeeding rail.

Ninth: MAINTENANCE: None of the Bonds placed in service showed evidence of depreciation in the Bond itself due to corrosion or lessening of the initial excellence of contact. This is accounted for by small area of metal exposed to corrosion, and the fact that the BOND is essentially a part of the rail and follows its very movement, whether due to expansion and contraction, or from unforeseen causes the BOND should work loose, a blow of the hammer on the readily inserted mandrel instantly restores the contact, or if necessary to replace it, the cost is only a few cents.

Tenth: Three years of experimental work has convinced us that the Jamison Rail Bond will outlive the life of the rail. Bonds placed in the month of April, 1910, in the Mifflin-Homestead line are in as good condition today as the day they were placed in the rail.

ELECTRIC SERVICE SUPPLIES CO.

Manufacturer of Electric Railway and Mine Haulage Material

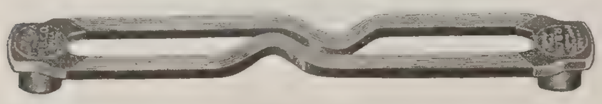
GENERAL OFFICES AND FACTORY:
17th and Cambria Streets, Philadelphia, Pa.

CHICAGO, ILL., Manadnock Bldg.
NEW YORK, 50 Church Street.
GEE ELECTRIC CO., Wheeling, W. Va.
LYMAN TUBE AND SUPPLY CO., LTD., Montreal, Toronto.
GRAYSON RAILWAY SUPPLY CO., St. Louis, Mo.
ATLANTA, GA., 1526 Candler Bldg.
ECCLES & SMITH CO., Los Angeles, San Francisco, Portland, Ore.

Products.

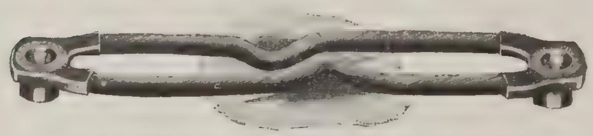
Electrical equipment for mine haulage systems; "Protected" Rail Bonds; Rail Bond Testers; Keystone Trolley Hangers, Clamps, Ears, Expansion Bolts; Porcelain and Glass Insulators; Garton-Daniels Lightning Arresters; Keystone Electric Block Signals; Pneumatic Signalling Systems; Electric and Magneto Signalling Systems; Keystone Water-Tight Telephones; "Safety-First" and other Signs—Illuminated and Plain; The Automotoneer—A Controller Regulator; Peerless Armature Repair Machinery; Trolley Material—Poles, Bases and Wheels; "Golden Glow" Headlights; Keystone Steel Gear Cases; Locomotive Gears and Pinions; Keystone Sand Driers; Keystone Lamp Guards.

All of the above lines and many more are fully covered in our complete mining catalogs, and in numerous special catalogs, copies of which will be sent to interested parties.



Type F Bond.

Type P-4-P Bond.



Type F-C-P Bond.

"Protected" Rail Bonds for Every Condition.

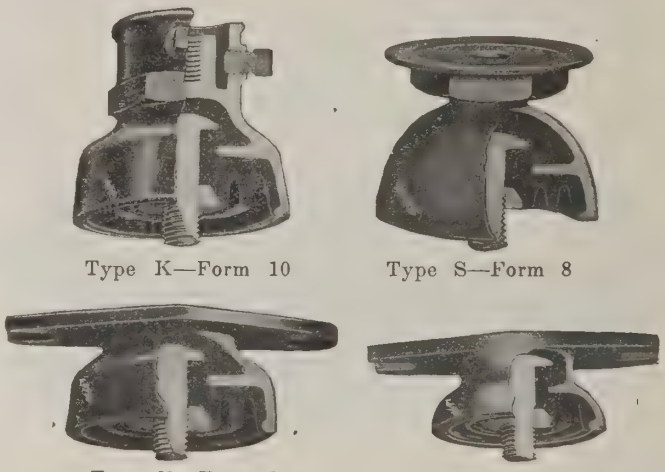
With your system bonded with "Protected" Rail Bonds, you will get maximum conductivity in your track return; your locomotives will be able to carry their full rated load without taking excessive current; you'll get fewer motor burn-outs; better lighting service; more cars per trip; less time per trip; and all this means that increased tonnage will be the inevitable result.

"Protected" Rail Bonds have terminals and strands of pure lake copper of high conductivity, united by the most improved forging and welding process known. In "Protected" Rail Bonds you get the well-known "Shot-Over" sleeve feature—a copper sleeve surrounding and protecting the strands at their point of emergence from the terminal, assuring you that the strands won't break at this point.

Made in both flat wire and cable forms, compressed terminal and pin driven types and are furnished to meet every possible service condition.

Over eight millions in daily service.

Have you our special Rail Bond Catalog?



Type K—Form 10 Type S—Form 8

Type K—Form 2 Type G—Form 2

Typical Keystone Trolley Hangers.

Type C—Keystone Trolley Wire Clamp.

The Line of Keystone Overhead Material Is Complete.

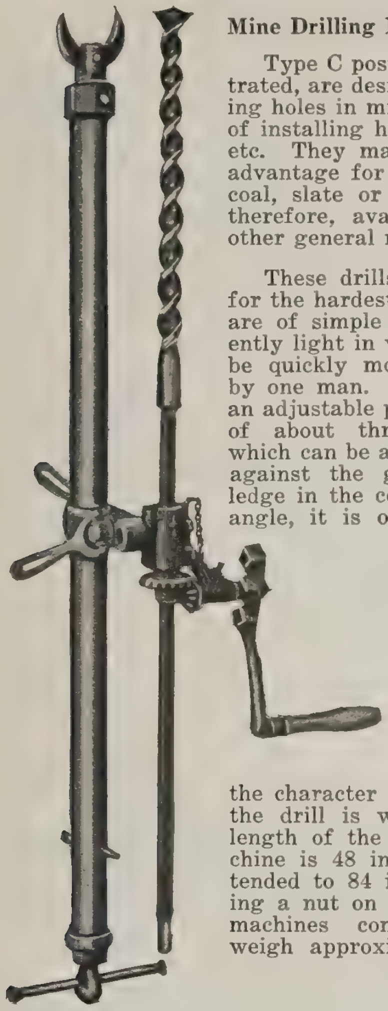
For supporting your trolley wire, your needs call for material that is the best; material that possesses properties of high insulation, great strength, proper design—material that has proven all this in the only thorough test, **the test of actual service.**

The entire line of Keystone Overhead Material is so varied and so flexible that your most exacting conditions can be met exactly.

Trolley hangers are designed for attaching direct to horizontal or vertical timbers or pipe, expansion bolts or to structural steel; are correctly and scientifically designed, and are insulated with Keystone Insulating Compound, standard for years in mining and railway service.

Keystone Trolley Ears and Clamps are made in many styles. The type C mechanical clamp shown above is a strong, cheap clamp, which has but three parts. They are easy to apply or remove, have a total depth of but 2⅜ inches, and are furnished for round, grooved and figure 8 wires.

Ask for Complete Catalog on Keystone Overhead Material.



Type C.

Mine Drilling Machine.

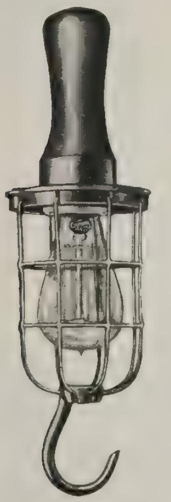
Type C post drilling machines, illustrated, are designed especially for drilling holes in mine roofs for the purpose of installing hangers for trolley wires, etc. They may also be used to good advantage for drilling at any angle in coal, slate or medium rocks and are, therefore, available for blasting and other general mine purposes.

These drills are of ample strength for the hardest kind of drilling and yet are of simple construction and sufficiently light in weight to enable them to be quickly moved about and handled by one man. They are equipped with an adjustable post, having an extension of about three-quarters its length, which can be anchored at the lower end against the ground or a projecting ledge in the coal. For drilling at any angle, it is only necessary to loosen the nut which holds the yoke. The position of the main post need not be changed.

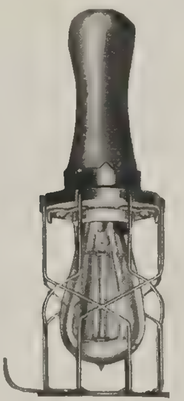
Type C drills feed automatically, being equipped with feed bars, having either 10 or 14 threads per inch for fast or slow feeding, depending upon the character of the material in which the drill is working. The minimum length of the post in a standard machine is 48 inches, which may be extended to 84 inches by simply loosening a nut on the clamp. The drilling machines complete without augers weigh approximately 65 lbs.

Keystone Portable Lamp Guards.

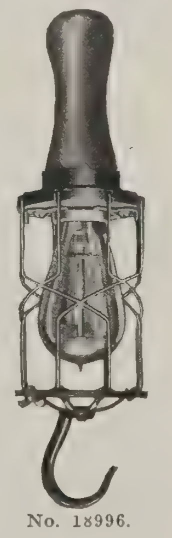
Keystone Lamp Guards are made **for service**, for service in mines, tunnels, engine rooms, repair shops, any place where requirements call for a **safe, strong, durable** lamp guard.



No. 12504.



No. 18997.

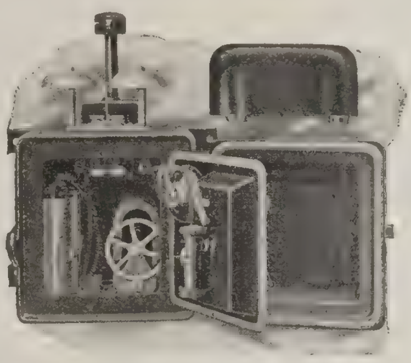


No. 18996.

Guards illustrated above are made entirely of malleable iron and steel parts and provided with well seasoned hard maple handles. Cages are of Bessemer steel wire, electrically welded at joints and all parts heavily tinned. All guards are insulated for 600 volts. Used for years by many of the largest operators throughout the country. Booklet on request.

Keystone Water-Tight Telephones.

The Keystone Water-Tight Telephone (Mine Type) is a mine telephone out and out. It has been designed for the most rugged conditions ever met in service. Every working part is absolutely sealed against the effects of gas or moisture. Even the bell clapper does not leave an opening in the case—it is operated by magnets inside the case, the magnetic field for operating same being transmitted through the iron. Down to the most minute details the Keystone Telephone is for hard, rough service, where the greatest reliability is demanded.



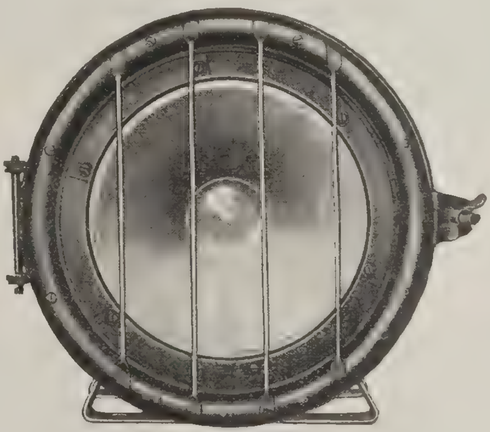
Keystone Telephone Opened Up.

Standard with many of the largest mining companies in the country.

We have a special catalog on Keystone Mine Telephones. Have you a copy?

Golden Glow Headlights

The need for an incandescent mine locomotive headlight which would replace the arc light or inefficient carbon bulb lamp is now obtainable in the Golden Glow headlight for mine service. The headlight is equipped with concentrated filament Mazda bulbs and offers many advantages not heretofore attainable.



Type ML-74.

These headlights provide maximum illumination under all conditions encountered in mining service, combined with low current consumption and maintenance cost, thus offering an efficient form of headlight for mine locomotive use.

They are equipped with yellowish green parabolic reflectors which cast a beam of golden-yellow light, which will penetrate fog, dust or smoke to a much greater extent than is possible with a white light. A special booklet will be sent on request.

Catalogs.

The various general and special catalogs published by this Company on Electric Mine Equipment should be in the library of every mining man. They will be sent on request.

THE W. R. GARTON COMPANY

CHICAGO

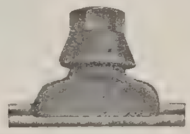
Electrical Mining Supplies

Black Diamond Hangers

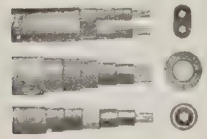
Flange and Expansion types save "head room." The shape and finish are "death" to dust and moisture. Tested at the factory for 5000 volts. With the "Sure Grip" Clamp you get a "strangle hold" on the trolley and it's up out of the way. We have cheaper hangers and clamps if you want them.

The "Sure Grip" Trolley Clamp

is the work of a master mind. It set the pace a number of years ago when the "idea" was in its infancy and it's been too much for the rest of them ever since. No other goes up as easily or "stays put" like it does; and when you pick it up it's all there, you don't have to count the pieces.



Mining Machine Cable



What trouble it can cause if it isn't made right, and how few do make it right. We learned our lesson many years ago by investigating service conditions. We found what was needed to make it "wear" both as to material and method of construction and then maintained a strict standard.

Salamander Asbestos Covered Magnet Wire

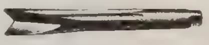
is a great profit maker. You cannot realize its saving until you have used it alongside C. C. magnet wire. Positively fire and moistureproof. Furnished by the reel or in new coils. We recover the wire in your old coils and rewind them. If you are "overloaded" Salamander Wire is the answer.

"Diamond Point" Bits

and Bit Steel are another result of trying to give the miner what he wants. Few grades of steel will produce "Diamond Point" service and these cost money, but we can afford to do it because "many a customer has been made" with an initial order of Diamond Point Bits. Keystone and all standard shapes.

"Diamond" Puncher Picks

are an eye opener too after you have been using some of those turned out by the novice. An unusual grade of High Carbon Steel is used and special attention is given the shank and points. They fit like a glove and the points hang on. Made for all makes of machines.

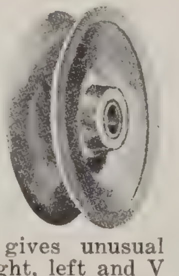


The Holland Mine Harps

solve a "real problem." If you want to experience the novel feeling that your trolley wheel troubles are over just let us send this Harp on thirty days free trial. A long lateral swivel, cable current connection and a "real contact" sleeve make it a wonderful success.

Urban Trolley Wheels

have but little scrap value because they stay up so long. They have just the right "balance" and a curve to the groove that makes them cling to the trolley. There is a great "trick" in making trolley wheels. We've got it, together with the formula that an experience of 16 years cannot improve.



Trolley Frogs

We use a special composition which gives unusual strength and wearing qualities. Made in right, left and V shapes and for any size wire. The secret of our success in copper products is in being sure we have the right formula and then sticking to it.

CHICAGO
THE W. R. GARTON COMPANY
ELECTRICAL SUPPLIES
STRICTLY HIGH GRADE
Columbia
FRICTION TAPE.
THE WEARING QUALITIES ADHERING QUALITIES & INSULATING QUALITIES BEST

Columbia Friction Tape

has 18 years of satisfied customers to its credit. It has yardage because the fabric and friction are right. It is unusually strong, doesn't ravel, insulates as well as sticks and it stays where it is put because it doesn't dry out. It's the kind miners need.

Velva Para Rubber Tape

is a side partner to Columbia Friction Tape and has been for 18 years. When the combination is needed you can't beat it. It too has yardage because it is not "doped" and for that reason has sufficient strength to "stretch into place" the way you like to have it.

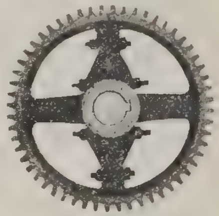
CHICAGO
THE W. R. GARTON COMPANY
ELECTRICAL SUPPLIES
STRICTLY HIGH GRADE
Velva-Para
RUBBER TAPE
THE WEARING QUALITIES ADHERING QUALITIES & INSULATING QUALITIES BEST

The Gravity Mine Coupler

fills a niche in coal mining where a long felt want existed. No more lost clevises, bent pins or hooks and the cost incidental to same. It is drop forged, not cast. We have the Mine Managers' word that it is the best, safest and cheapest coupler on the market.

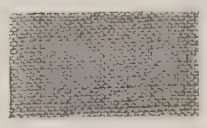
Gears and Pinions

Take no chances on this portion of your equipment and let us furnish you with Van Dorn & Dutton's product. They know how to make them correctly and just what grades of steel to use to get maximum service and what's more the price is right. For all makes of machines.



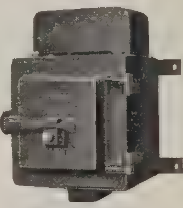
Brattice Cloth

In keeping with our policy to provide our customers with standard products in every line we investigated this field thoroughly and are able to offer several grades of Brattice Cloth of exception quality. Only selected fibres are used and these very closely woven and fireproofed.



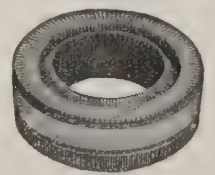
Mine Telephones

are no longer a luxury but a necessity in these days of "High Efficiency." The Mine-A-Phone is designed and built with mine service in view and, therefore, is free from many of the annoyances of the average mine telephone. While somewhat more expensive it is by far the cheapest in the long run.



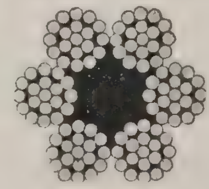
Eureka Commutators

Drop forged, cast or drawn bars of pure lake copper assembled in a manner that only many years of experience can accomplish. We also specialize in Armature and Field Coils and complete Armatures. We have secured unusual results in workmanship at prices below the average.



Incandescent Lamps

Mazda, Tungsten and Carbon. There is a growing demand for Tungsten Lamps for mine use since they have been made more rugged. We have long specialized in Lamps for mine use and believe our experience may be of value to you. Our "America" Carbon Lamp has been a mine standard for close on to 18 years.



Waterbury Wire Rope

We believe that nothing short of the best will do when lives are at stake. The above listing is but indicative of our line. We can furnish anything electrical. For 18 years we have been serving the Coal Mining Fraternity and according to many we have done it well.

IRON CITY ELECTRIC CO.

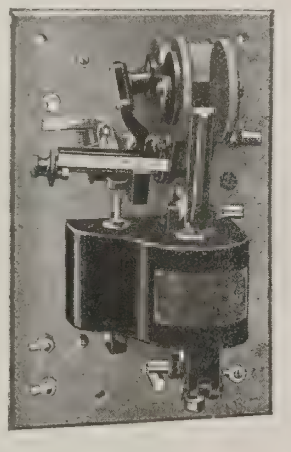
Electrical Supplies

PITTSBURGH, PA

Products

We have a complete line of everything Electrical for the Mine and Shop, including Ammeters and Voltmeters; Batteries, all kinds; Mine Machine Cables; Carbons and Carbon Brushes; Circuit Breakers; Trolley Clamps; Conduits; Condulets; Controllers, D. C. and A. C.; Overhead Trolley Supplies; Dynamos and Motors; Electric Lamps, Arc and Incandescent; Mine Hangers; Electric Fans; Fibre; Flash Lights; Fuses; Electric Gongs; Heavy Hardware; Trolley Harps; Headlights; Insulators and Pins; Insulated Wire and Cable; Magnet Wire; Mine Telephones; Insulating Paints and Varnishes; Recording Instruments; Rheostats; Switches and Switchboards; Transformers; Trolley Wheels; Poles.

Automatic Circuit Breakers



Type "I" Automatic Reclosing Circuit Breakers were designed and developed primarily for individual motor protection, applicable to the protection of any form of industrial D. C. motors. They are built in 50 and 100 ampere capacities. The particular feature which distinguishes this breaker from other breakers ordinarily used for individual motor protection is the automatic reclosure upon the return of the starting box handle to the "off" position. This reclosure is automatic and instantaneous. Write us for prices and descriptive bulletins. **See page 539 for detailed description.**

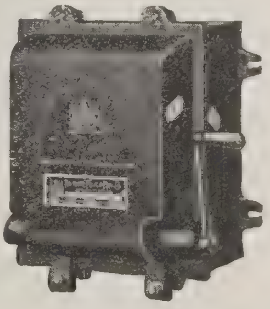
Wires and Cable

Ansonia "Shield Brand" Weather-Proof, Fire and Weather-Proof and Slow Burning Wires and Cables; Annunciator, Damp-Proof Office and Magnet Wires.

If you have never used "Shield Brand" Wires and Cables, try it and allow us to prove to you that it is not merely a question of price per pound that interests you, but **Quality** as well. If Real Economy means anything to you, if Durability and Service are essentials, use "Shield Brand" Wires and Cables.

A large stock carried in our Pittsburgh warehouse.

Detroit Fused Switches



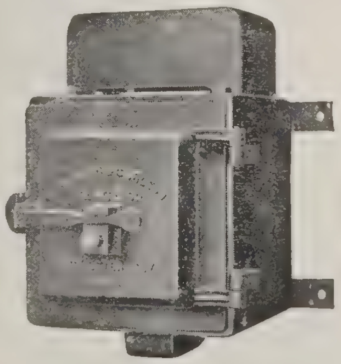
The Detroit Iron-Clad Fused Switch is the Original **"Safety First"** Switch put on the market. It has been designed to meet the most rigid requirements of safety devices for controlling electrical equipment of mines. No vital parts can be injured through exposure to water, gas fumes or dust, as it is constructed to withstand the most severe conditions found in mine installations.

Write for Bulletin giving fuller description, also **see Page 546.**

Mine-A-Phone

The No. 890 Mine-A-Phone is the only **Real** mine telephone built to withstand conditions found in the mine. It is the result of a thorough and extensive study of mine conditions, and contains many features not found in any other makes. No other telephone so completely meets the needs of underground service.

For further particulars write us for your copy of Bulletin No. 1000 or page No. 538.



No. 890 Mine-A-Phone
Showing Plunger and Lock.

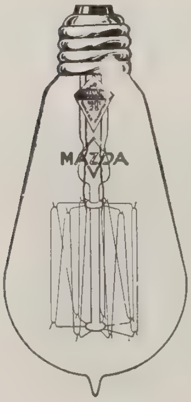
W. T. McCULLOUGH ELECTRIC CO.

PITTSBURGH, PA

Electrical Supplies

A Partial List of Our Line

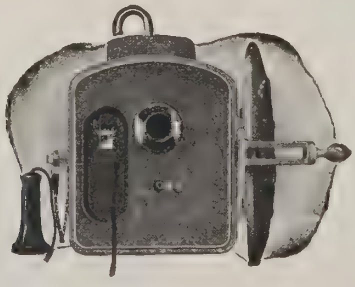
Mine Hangers
Expansion Bolts
Trolley Splicers
Mine Feed Wire Insulators
Trolley Wheels
Trolley Ears
Trolley Frogs
Section Insulators
Strain Insulators
Carbon Brushes
Commutator Cement
Friction Tape
Knife Switches
Telephones
Lamp Guards
Iron Conduit
Wiring Devices of All Kinds
Rubber Tape
Safety Switches
Telephone Supplies
Panel Boards
Condulets
Peirce Specialties
Lightning Arresters
Gongs—Mechanical
Gongs—Electrical
Ever Ready Flashlights
Benjamin Reflectors
Enclosed Fuses
Refillable Fuses
Carbon Lamps
Mazda Lamps
Insulating Material



Incandescent Lamps

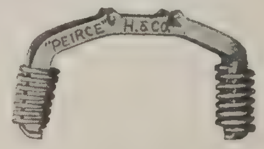
For Mine Service we particularly recommend our Duquesne Carbon Lamp. All voltages up to and including 300 volts carried in Pittsburgh; also a complete stock of Mazda Lamps.

Connecticut Weather-Proof Iron Box Telephones



These telephones are designed for mine use. This is a complete telephone with powerful generator, ringer, induction coil, transmitter, receiver, lightning arrester, etc., all parts of which have been specially treated to withstand weather conditions. Write for catalog for full details.

Peirce Mine Brackets



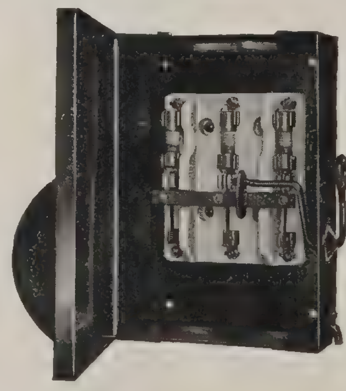
The Peirce Mine Brackets were developed for mine service. They are attached in position shown, by means of Lag Screws or Hanger Screws. We also carry a complete line of all Peirce Specialties.

Insulating Materials

We would particularly call your attention to our stock of Insulating Materials for all kinds of repair work.

Mica
Fibre Board
Fibre Rods
Fibre Tubes
Insulating Paint
Insulating Varnish
Linen Tapes
Varnished Cloth
Linotapes
Cotton Sleeving

Insulating Papers of all kinds.



Safety Switches

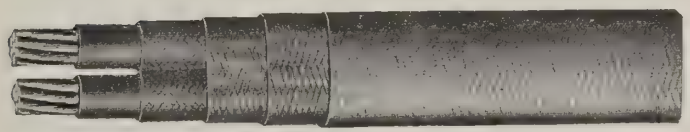
We carry a line of Safety Switches in Pittsburgh stock to meet all requirements; also a complete line of standard Knife switches.

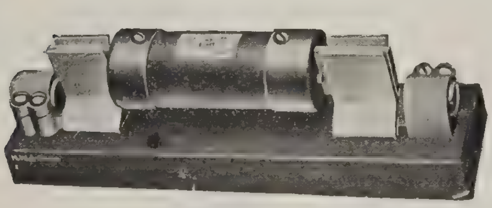
THE POST-GLOVER ELECTRIC CO.

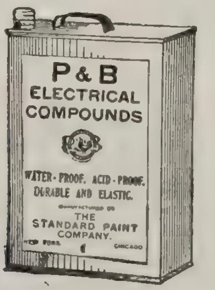
314 - 316 West Fourth Street,
CINCINNATI, OHIO

Products

A complete line for the mine or shop consisting of Mining Machine Cable, Bare, Weatherproof and Rubber Covered Wires, Batteries of all kinds, including the famous Eveready Storage Battery, Friction and Rubber Tapes, Trolley Clamps, Conduits, Condulets, Overhead Line Materials, Fibre, Eveready Flashlights, Noark Fuses, Magnet Wires, Insulating Paints and Varnishes, Emerson Fans, Mazda and Carbon Lamps.

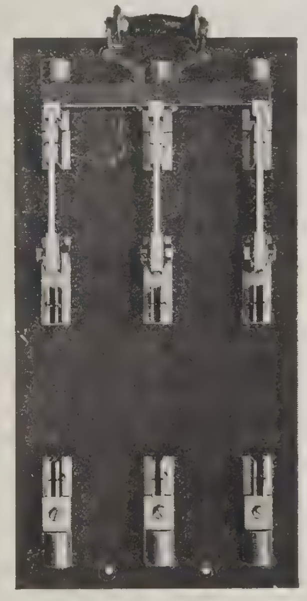






Manufacturing

Our switchboard is one of the most complete in the middle-west and we are prepared to build your switchboards in accordance with the rules of the Underwriters. Our Glover "A" Switch is known wherever a switch of durability is required.



Lighting Fixtures

A complete line of lighting fixtures and portables for all users of electric current.

Shipments

Our reputation for shipment of goods on the same day that orders are received is univeraslly known wherever electrical supplies are required.

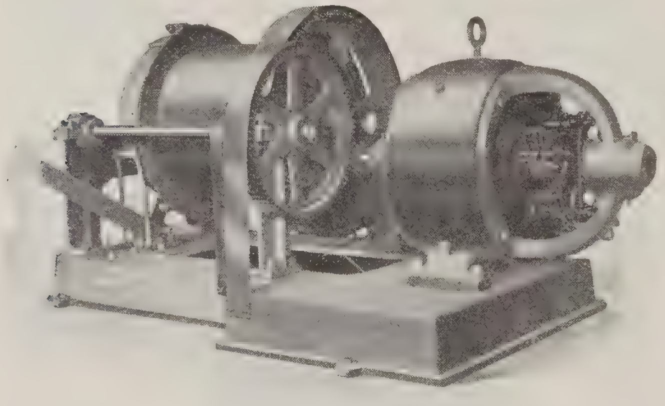
Send us your inquiries and order for anything ELECTRICAL.

THE SACKETT MINE SUPPLY CO.

Main Office and Factory, Columbus, Ohio
SALES OFFICE, WELCH, W. VA.
Supplies for Morgan-Gardner Machinery.
General Electric Motors, Skinner Engines

Electrical Construction, Supplies and Repairs

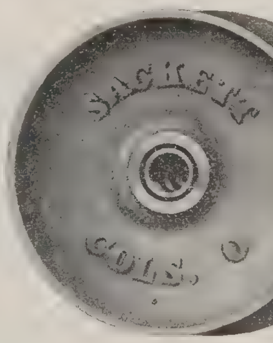
Products
Electric Hoists, Mine Fans, Line Material, Insulators, Trolley Wheels, Trolley Harps, Armature Rewinding, Rebuilding and Repairing of Electrical Machinery; Machinists.



"SACKETT" Single Drum Electric Hoists, Sizes 5 H. P. to 60 H. P. Send for "Pamphlet R."

Sackett Type "A" Insulator
An improved device for supporting feed wires in Coal Mines. Consists of malleable iron pin and white vitrified porcelain knob. Is self-draining, has no springs, washers or other small parts, is easily put up and taken down. The porcelain knob locks securely on the pin which is 8½ in. long. The knob is 2½x2 in, with ¾ in. groove—large enough for 4-0 bare wire or cable. Total weight 1¼ lbs. Ask your dealer.

Sackett "Heavy Type" Trolley Wheel
These wheels will out-wear three of the ordinary wheels and the rims cannot be cut or worn off.



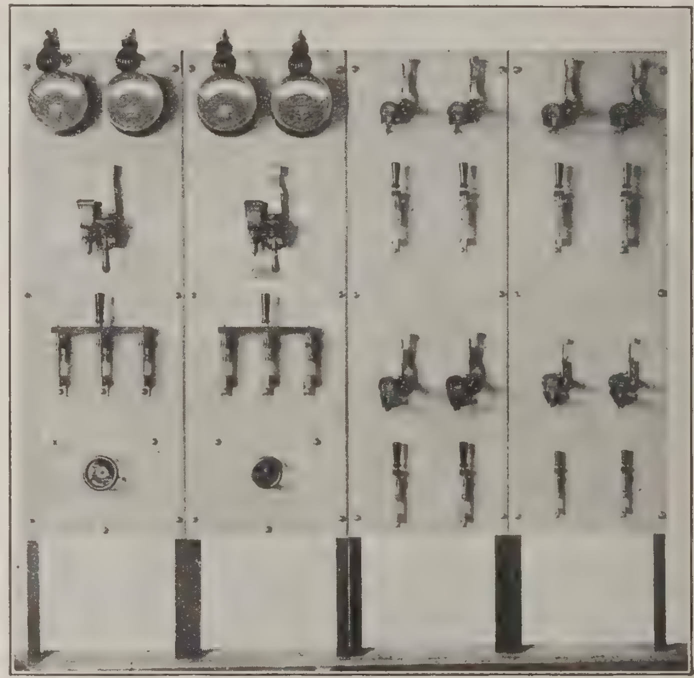
Mine Fans
either belt driven, or direct connected to motors. Put your ventilation problems up to us.

Electrical Repairs

Our plant which covers 22,500 square feet of floor space, contains a finely equipped Rewinding Shop, and Machine Shop with every facility for repairing or rebuilding Mining Machinery. Quick service, good workmanship and reasonable prices guaranteed.

Screen Bars and Bearing Bars in stock.

We Build Switch-Boards
for every condition of power and lighting service for coal mines and factories. Over 800 panels have been built by us for coal mining plants.



Motors and Controllers
We supply a large number of different forms of motors and controllers to meet the varied requirements of coal mine and factory service, both direct and alternating current motors for belted, geared, silent chain or direct connected drives for continuous or intermittent load, constant or variable speed.

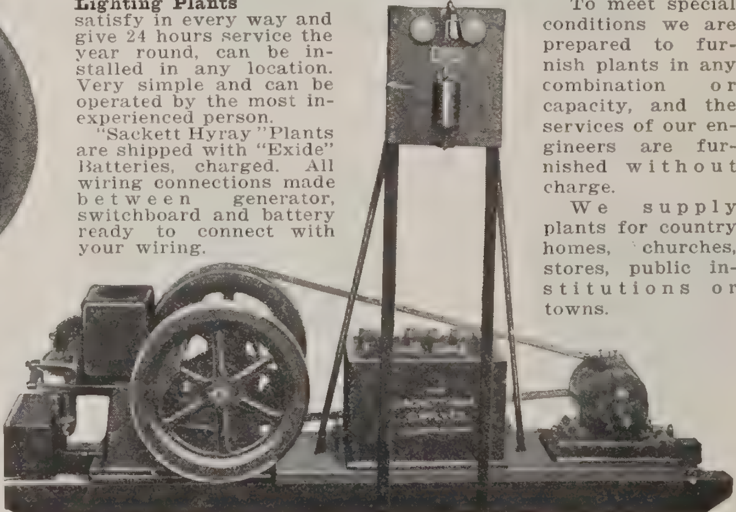
We will be pleased to supply engineering data and recommendations as to the type and form of motor best adapted to customers' conditions.

"Sackett Hyray" Electric Lighting Plants
satisfy in every way and give 24 hours service the year round, can be installed in any location. Very simple and can be operated by the most inexperienced person.

"Sackett Hyray" Plants are shipped with "Exide" Batteries, charged. All wiring connections made between generator, switchboard and battery ready to connect with your wiring.

To meet special conditions we are prepared to furnish plants in any combination or capacity, and the services of our engineers are furnished without charge.

We supply plants for country homes, churches, stores, public institutions or towns.



UNION ELECTRIC COMPANY

Electrical Supplies of All Kinds

PITTSBURGH, PA

The following partial list will give an idea of the wide and varied line of supplies we handle. We cannot, of course, begin to list here our complete line, but in a few words will say that we are in position to furnish anything and everything in the electrical supply line for mines and largely from our Pittsburgh stock.

Products

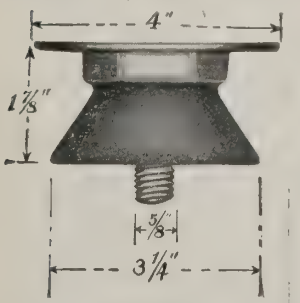
Mine Locomotive Headlights,
Gears and Pinions,
Mine Locomotive Trolleys,
Mine Hangers,
Expansion Bolts,
Trolley Splicers,
Trolley Crossings,
Electric Rock Drills,
Bo-arrow Cross Arms,
Insulating Paints,
Babbitt Metal,
Commutator Cement,
Track Drills,
Jacks,
Mine Feed Wire Insulators,
Electric Mine Lamp Bulbs,
Carbon Brushes,
Trolley Pole Heads and Harps,
Trolley Wheels,
Flexible Couplings,
Clamping Ears,
Trolley Frogs,
Section Insulators,
Pierce Specialties,
Lightning Arresters,
Bond Testers,
Automatic Cable Clamps,
Third Rail Insulators,
Gongs,
Eveready Flashlights,
Ivanhoe Steel Reflectors,
Rail Bonds,
General Wiring and Lighting Supplies.

Nuttall Gears, Pinions, Trolleys and Trolley Parts

Nuttall Gears and Pinions for haulage locomotives, mining machines, pumps,—in fact, gearing of any standard or special design. See full page adv. on page 482.

General Electric Railbonds and Overhead Line Material.

Quality established and prices right; railbonds for every condition—either pin driven or solid terminals. Our new type combination low mine hangers (see cut) will take care of installations in coal, on timber or on pipe brackets by using with it our expansion bolts, hanger lag screws or combination pipe clamps. Our mechanical Trolley Clamp is far better than any other type. Write for descriptive bulletin or samples.



See full page adv. on page 521.

Fort Wayne Electric Rock Drill

This type of drill is being used by a great number of mine owners and is considered the standard. The expense of maintenance and current consumption are both very low and it will prove satisfactory in any rock encountered in a coal mine. Communicate with us if you have any rock faults and we will demonstrate its superiority over any other make of drill on the market. Write for testimonial letters and bulletin. See full page adv. on page 499.

Insulating Material for Repair Work

A large stock of all kinds of insulating material is carried by us in Pittsburgh. Send for our insulating paint and varnish catalog which shows the proper paint or varnish to be used for all classes of insulating work.

Crouse-Hinds Headlights

of every description, Arc, Incandescent, and Luminous. Write for literature on later types of Luminous Headlights. Furnished on trial basis. See full page adv. on page 478.

General Supplies

Our stock is very complete and well selected. We claim to be headquarters for mine supplies. Send us your inquiries and orders and let us prove this fact to you as we have to many others.

WESTERN ELECTRIC COMPANY

INCORPORATED

NEW YORK
BUFFALO
NEWARK
PHILADELPHIA
BOSTON
PITTSBURGH
ATLANTA
RICHMOND
SAVANNAH
NEW ORLEANS
BIRMINGHAM
CINCINNATI
CHICAGO
MILWAUKEE
INDIANAPOLIS
DETROIT
CLEVELAND
MINNEAPOLIS
ST. PAUL
KANSAS CITY
ST. LOUIS
DALLAS
HOUSTON
OKLAHOMA CITY
OMAHA
DENVER
SAN FRANCISCO
OAKLAND
LOS ANGELES
SEATTLE
PORTLAND
SALT LAKE CITY

Equipment for Every Electrical Need

Western Electric

Mine Telephones

The modern mine telephone, as made by the Western Electric Company, fulfills the requirements of a telephone fully protected against the rigors of mine service.

No. 1336 Type Mine Telephone. Outer Door Closed.

Electrically, the Western Electric mine telephone contains practically the same apparatus as the familiar magneto telephone. Here, however, the resemblance ceases as the mechanical features are entirely different.

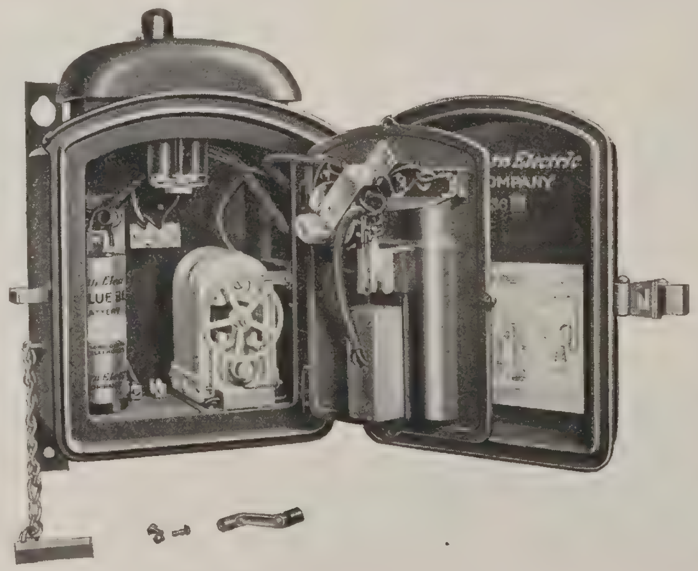
All apparatus is fully enclosed in a substantial cast iron case finished with three heavy baked-in coats of black enamel.

The double-door form of construction with the protection given to the individual pieces of apparatus and other parts makes this mine telephone proof against moisture, dust and the corrosive action of mine gases.

The telephone is also protected against mechanical injury by the curved surface of the gong housing and the curved top of the case itself. This makes it possible for falling objects and water drippings to slide off easily. The construction of the gong housing is such that the telephone can be exposed to driving rain without any danger of water entering the opening.

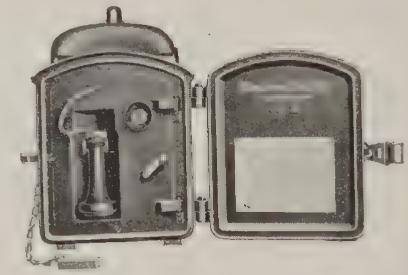
The outer door of the telephone case protects the transmitter mouthpiece, receiver and cord and generator crank, the only parts visible when this door is opened, while the second door aids in protecting all the apparatus within the case.

The transmitter mouthpiece and generator crank handle are heavily enameled; the receiver parts, including coils and magnets, are protected against moisture, and the receiver cord is thoroughly impregnated with moisture-proofing compound.



No. 1336 Type Mine Telephone. Both Doors Open.

The generator springs are covered with asphaltum paint. The generator terminals are mounted on a hard rubber block and after connections are made, they are covered with a waterproof compound. Switchhook springs and ringer terminals are covered with asphaltum pain and compound respectively. The induction coil is mounted in a hard wood case whose parts are boiled in linseed oil before they are assembled. These boxes are not glued but are fastened by means of brass screws, while the spaces between the sides and the induction coil are filled with water-proofing compound.



No. 1336 Type Mine Telephone. Outer Door Open.

To prevent battery trouble, the cardboard cartons are thoroughly impregnated with water-proofing compound to prevent the absorption of moisture which would otherwise short circuit adjacent cells. To safeguard the batteries still further and prevent them from coming into contact, circular holes, each large enough for one cell, are provided in the wooden block supporting the batteries. All wiring is done with Habirshaw red rubber core cable, fastened with insulating tape and treated with asphaltum paint. Every iron part is triple electro-galvanized.

In the construction of this telephone, the Western Electric Company has exercised the same insight into operating conditions and the same care in design and manufacture that have made its telephones the standard for the world.

Write for our illustrated booklet — "Mine Telephones and How to Install Them." Let our engineers assist you in laying out a mine telephone system for your mine.

WESTERN ELECTRIC COMPANY

INCORPORATED

NEW YORK
BUFFALO
NEWARK
PHILADELPHIA
BOSTON
ATLANTA
RICHMOND
SAVANNAH
NEW ORLEANS
BIRMINGHAM
CHICAGO
MILWAUKEE
INDIANAPOLIS
DETROIT
CLEVELAND
KANSAS CITY
ST. LOUIS
DALLAS
HOUSTON
OKLAHOMA CITY
SAN FRANCISCO
OAKLAND
LOS ANGELES
SEATTLE
PORTLAND
PITTSBURGH CINCINNATI MINNEAPOLIS ST. PAUL OMAHA DENVER SALT LAKE CITY

Equipment for Every Electrical Need

Western Electric

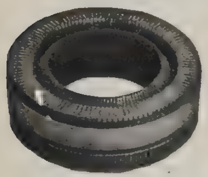
Mine Supplies

General

The Western Electric Company is prepared to furnish equipment for every electrical need in the mine. Ample stocks are constantly maintained at each of our distributing houses to give customers the best possible service. We are emergency specialists.

The following are some of the complete lines carried. They are the best of their kind. The name Western Electric guarantees their high quality.

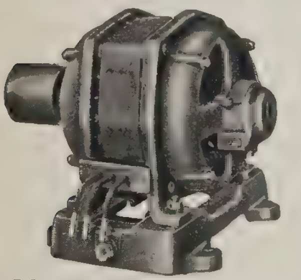
Car Parts


Commutators.

This line includes standard Shelby trolley poles, trolley harps, Kalamazoo trolley wheels and harps, head lights, lamps, circuit breakers, rheostats, commutator parts, Samson cordage, brushes and brush holders.

All car parts are designed and built for long service. Their use insures low maintenance costs.

Motors


Western Electric Motor

Direct and alternating current electric motors are available for every phase of mine work—for cars, hoists, pumps, crushers and exhaust fans. They are built under the most comprehensive specifications and every step in manufacture is conducted under rigid inspections. Western Electric motors require only a minimum of maintenance for maximum service.

Overhead Materials

Under this head are included frogs, suspension clamps, insulators, trolley ears and everything else for the line—all of the best.

Reel Cable

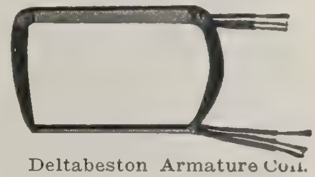
For mine locomotives, Western Electric reel cable will be found to have a life many times longer than the ordinary commercial cable. This is due to the special linen braid covering the flexible conductors.

Magnet Wire

Enamel coated, cotton or silk covered magnet wire of high conductiviy is carried in stock in large quantities. This wire will meet all ordinary requirements satisfactorily.

Deltabeston Magnet Wire

This is a flexible, fire and moisture proof wire particularly adapted to field and armature coil winding. The insulation is an asbestos composition which adapts it for use where overloads are frequent and severe. Square and rectangular Deltabeston wire makes it possible to put a greater cross-section of copper into a given winding space than is possible with round conductors.


Deltabeston Armature Coil.

Mining Machine Cable

Duplex mining machine cable consists of flexible strands, rubber insulated. Each conductor is finished with a waterproof braid. Two conductors are then laid parallel and covered with two or three braids of hard cotton, which is then thoroughly waterproofed.

D. & W. Fuses

These fuses are designed for accuracy and safety. They meet every requirement of the National Electric Code and can be relied upon to withstand great mechanical strains and the severest electrical conditions.

Mica

Both cut and uncut mica of the highest grade can be furnished for insulating purposes. The line of mica includes micanite commutator insulation and rings, micanite plates for molding into any desired shape and flexible micanite plates.

Insulating Cloths, Papers and Varnishes

These materials include oiled cloth, linen, silk, tapes and paper in which the cloths and paper serve as a carrier for the insulating oil. The oil when dried provides an insulating substance of great strength, flexibility, long life and high resistance to heat and electricity.

The line of insulating varnishes includes air drying and baking varnishes of every description. They are durable and have excellent insulating properties.

Headlights

The complete line of Crouse-Hinds headlights will meet any requirement of mine car service. These headlights produce a brilliant, darkness-piercing light.

Graphite Lubricating Bushings

For insuring oil-less lubrication, the line of "Bound Brook" bushings will be found most efficient.

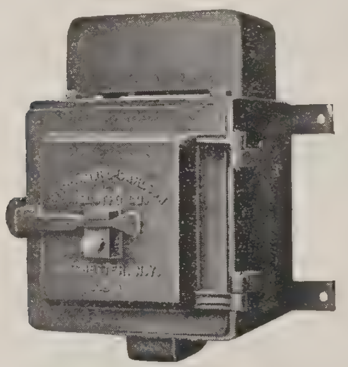
STROMBERG-CARLSON TELEPHONE MFG. CO.

ROCHESTER, NEW YORK, U. S. A.

CHICAGO, ILLINOIS TORONTO, ONTARIO

MINE-A-PHONE MINE-A-PHONE

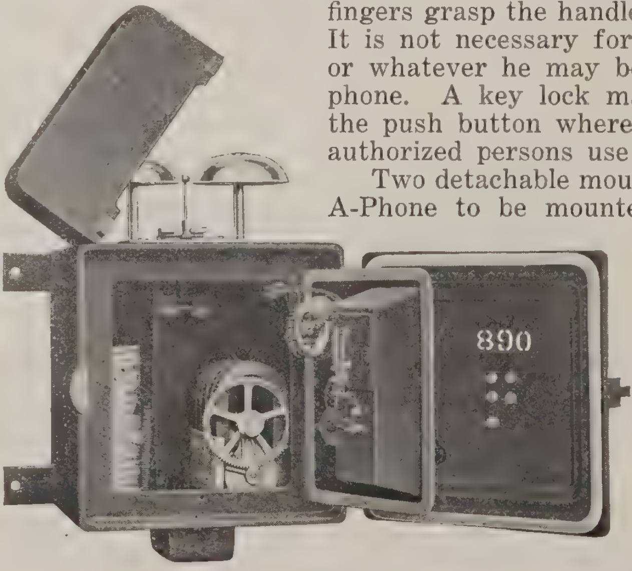
The design of the Stromberg-Carlson Mine-A-Phone is the result of a thorough and extensive study of mine conditions and includes suggestions of many experienced mine engineers. No other telephone so completely meets the needs of underground service. It is a real mine telephone—built for the mine and not adapted to it.


No. 890 Mine-A-Phone
Closed View

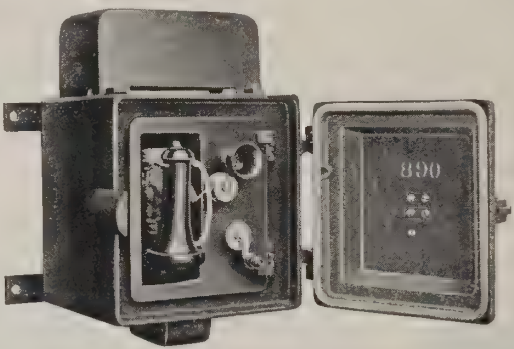
The No. 890 Mine-A-Phone consists of complete self-contained magneto telephone equipment arranged in a comparatively small iron case, finished in a black waterproof and acid-repellant enamel. The talking and signaling apparatus is placed within the inner compartment, where it is protected from moisture and gas and yet can be readily inspected or removed when necessary.

The door to the inner compartment is protected against the entrance of moisture by a wide overlap of felt, and the door is fastened shut by four machine screws. All openings through the inner case, such as required for the generator crank shaft, are protected by gaskets and packing.

The ringer is so arranged that the coils are inside the inner compartment, but the armature is outside the case and no holes remain through which water can enter the case. The ringer gongs and armature are protected by a cast iron dome which has an opening around its base through which the sound can be heard. The inner compartment need only be opened for the replacement of batteries, and this is seldom necessary.


No. 890 Mine-A-Phone—Both Doors Open
Note Gaskets on Doors and Accessible Arrangement of Equipment

When the outer door is opened the receiver, weather-proof linen cord, take-up device, transmitter mouthpiece and generator crank handle are exposed. The take-up device automatically takes up the slack in the receiver cord so that it will not be injured in the hinges of the outer door. The outer door is equipped with a rubber gasket, which renders the entire Mine-A-Phone water-proof, gas-proof and acid-proof when the door is closed. The case is high grade iron casting and will withstand fire and explosion. All coils are specially treated to resist moisture and all metal parts are protected by enamel or zinc plating.


No. 890 Mine-A-Phone—Outer Door Open

A feature that has recently been added to the Mine-A-Phone is the new push button lock on the outer door. This lock requires the use of but one hand to open it. Simply pressing the palm of the hand against the button releases the catch, the fingers grasp the handle and the door swings open. It is not necessary for a miner to drop his tools or whatever he may be carrying to use the telephone. A key lock may be supplied in place of the push button where it is desired to have only authorized persons use the Mine-A-Phone.

Two detachable mounting bars permit the Mine-A-Phone to be mounted on almost any surface. The actual dimensions of the No. 890 Mine-A-Phone are 10¾″ high x 10″ wide x 8½″ deep.

Mine-A-Phone layouts, including circuit arrangements, types of surface telephones and switchboards, are furnished for each mining system as required. Write for Bulletin No. 1000, which clearly explains the Mine-A-Phone system in detail.

The Automatic Reclosing Circuit Breaker Co.

COLUMBUS, OHIO

AGENTS

A. Fred Phelps, Bluefield, W. Va.
Jos. B. Noros, 50 Church St., New York City.
Iron City Electric Co., Pittsburgh, Pa.
Railway Industrial Engineering Co., Pittsburgh, Pa.
Tennessee Mill & Mine Supply Co., Knoxville, Tenn.
McClary-Jemison Machinery Co., Birmingham, Ala.
T. Weiss, 1240 Majestic Bldg., Milwaukee, Wis.
Wm. Miller Tompkins, 4813 Haverford Ave.,
Philadelphia, Pa.
Louis J. Kaiser, 146 Park Blvd., Detroit, Mich.

Products

Automatic Re-Closing Circuit Breakers for D. C. circuits.

(1) Open instantly on short circuit or overload.

(2) Remain open as long as short circuit or overload remains on line.

(3) Close instantly as soon as short circuit or overload is removed.

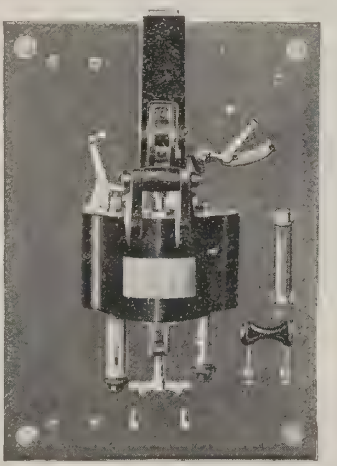
(4) Are used to protect independent feeder circuits of Motor Generator Sets, Generators operating in parallel, Feeder Circuits to a net work of distribution, and on branch circuits.

(5) Make it possible to operate sub-stations without an attendant except to start and stop machines.

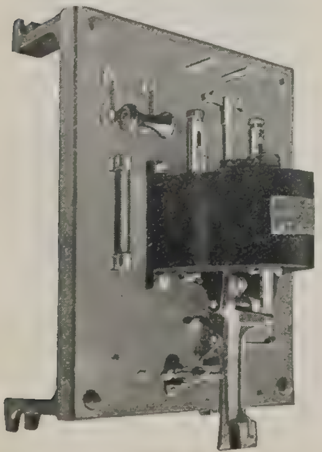
(6 Provide an ideal protection for branch circuits in mines.

Type "A" Breaker

is a switch board instrument of substantial construction and highly finshed. This type is built in capacities ranging from 300 to 800 amperes.



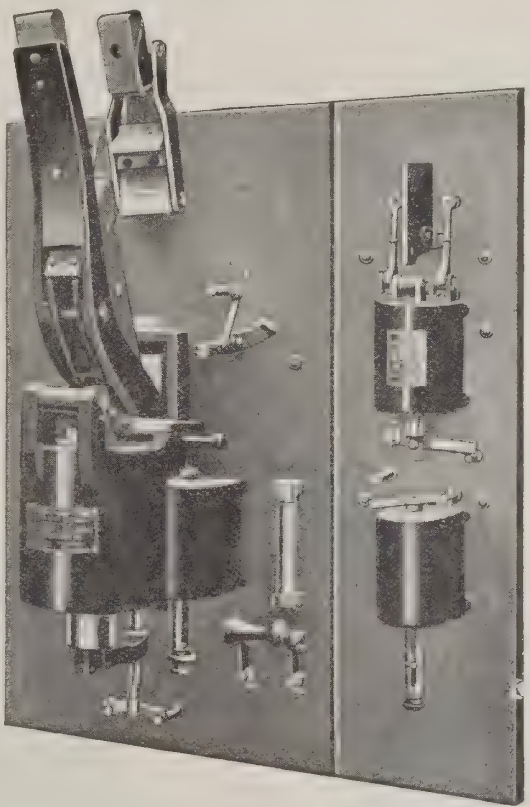
Type A



Type C

Type "C" Breakers

are especially suitable for the protection of individual circuits in D. C. industrial and mine installations. These machines are ruggedly constructed, and the design has been simplified with the view of producing a reliable Automatic Re-Closing Circuit Breaker at a low price. These machines are built in capacities up to 400 amperes.

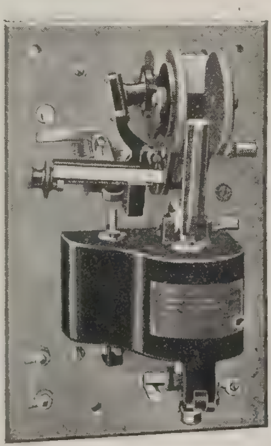


Type D Breaker and Type F-2 Feeder Circuit Relay.

Type "D" Breakers have the same general characteristics as type "A," but are built for greater current capacity, and all parts are correspondingly heavier.

The main contact brush is of a laminated butt contact construction, and is held in contact under a very heavy pressure. The main contacts are protected from arcing by an auxiliary contact and carbon break tips of very rugged construction.

These breakers are made in capacity of 1200 to 2000 Amperes.



Type I

Type "I" Breakers

are built in capacities up to 100 amperes and are especially suitable for the protection of individual motors.

They are wired up in connection with the starting box or controller and operate to open the circuit on over-load and remain open as long as the starting box or controller is in any other position than the "off position."

When the starting box or controller is thrown to the "off" position, the breaker automatically and instantly recloses.

They may be locked up in a box to prevent having the setting changed and thus absolutely prevent the abuse of a motor so protected.

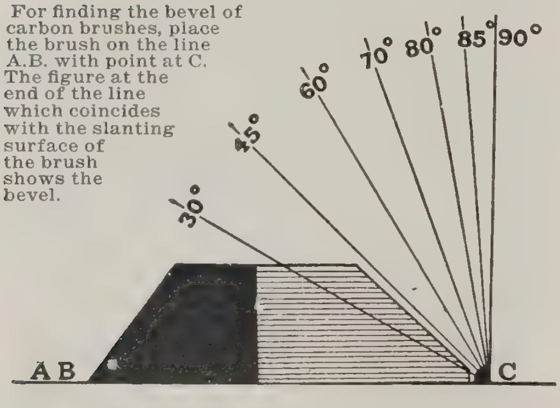
Calebaugh Self-Lubricating Carbon Co.

Incorporated

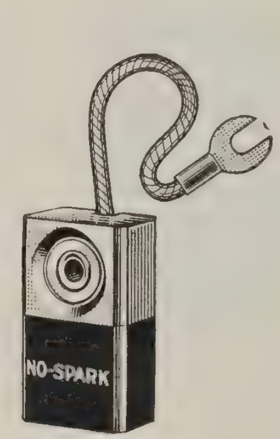
1503 Columbia Avenue
PHILADELPHIA, PENNA.

Makers of

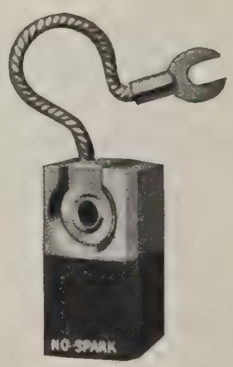
High Grade Carbon, Graphite and Metallic Brushes



For finding the bevel of carbon brushes, place the brush on the line A.B. with point at C. The figure at the end of the line which coincides with the slanting surface of the brush shows the bevel.



Type SS Riveted.



Type CS-2 Riveted.

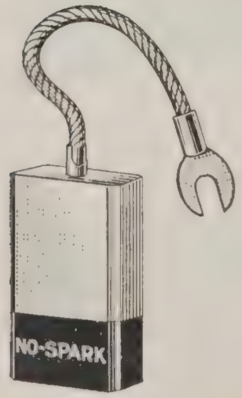


Fig. J.

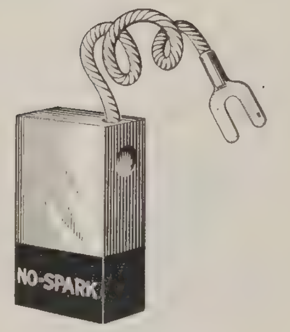
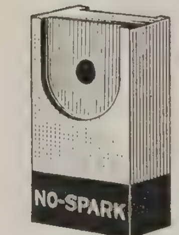
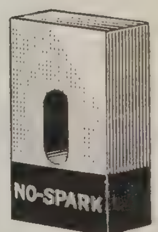


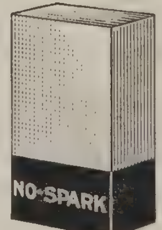
Fig. K.



Saddle Recess



Center Slot



Square Cut.

We manufacture Brushes to meet all the requirements of your operating conditions "a catalogue sent upon request."

Notice.

The advantage in ordering Brushes from us you get the best suited grade for your machine. This will mean cool frictionless and sparkless commutation no annoying delays, no unnecessary electrical losses and stops that rapid deterioration of the commutator. We are the only makers of the "No-Spark Brush."

Deliveries made Promptly.

Le Valley-Vitae Carbon Brush Co.

Main Office and Works, 521 W. 23rd Street
NEW YORK, N. Y.

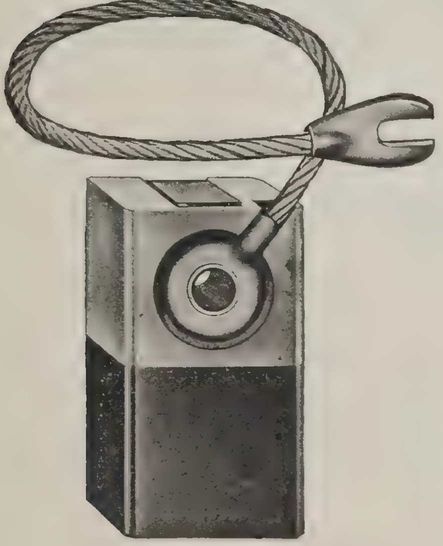
SALES OFFICES

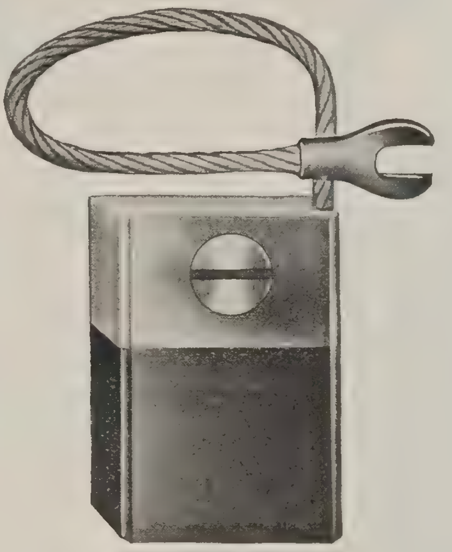
PITTSBURGH, Westinghouse Bldg.
NEW ORLEANS, Hennen Bldg.
BIRMINGHAM, First National Bank Bldg.
CLEVELAND, Wade Bldg.

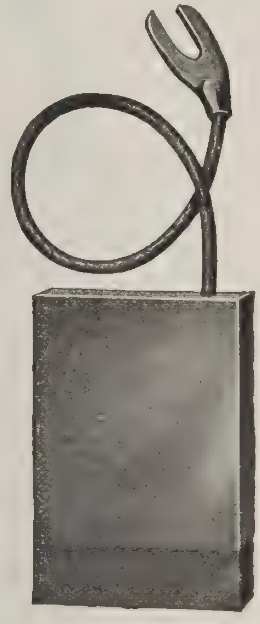
The selection of a carbon brush to accomplish an express result is oftentimes a difficult matter for both the designing and operating engineer.

Le Valley Brushes are now designed in grades or series in varying degrees of hardness, resistance, and current densities to meet all conditions of service. Each grade with suggestions as to its application, is fully described in a new catalog, with curves by the Electrical Testing Laboratories, New York.

It is felt that this information will be of service to users by assisting them to select the proper brush for their particular conditions.







Made up in any shape or size for any make of machine. A grade for every service.
Prompt deliveries. Trial sets furnished.

PITTSBURGH CARBON BRUSH CO.

N. S. PITTSBURGH

Commutation Engineers

and

Manufacturers of Highest Grade Carbon Brushes

Has it ever occurred to you that you can save from 40% to 80% on your electrical repairs by using the proper brush on your Motors and Generators?

Engineers and those responsible for the proper performance of electrical equipment have, within recent years, been giving considerable attention to the subject of carbon brushes.

This is due to the fact that the selection of the proper brush is a matter of prime importance in securing the most efficient and economical service from a motor, generator or controller.

Inefficient operation of many machines, which is often charged to faulty design or other conditions, has been due to the use of brushes which were not suitable for the service required.

A brush that will operate satisfactorily on one machine will very often give poor service on another, although there be no radical difference in the design or application of the two machines.

There are a number of factors entering into the selection of a brush of the proper grade, some of which are voltage, current density, peripheral speed of commutator, style of brush holder, and a number of other conditions, all of which are factors of more or less importance in determining the right brush to use in order that there will be no undue heating, excessive friction, no sparking and that wear on the commutator and brushes will be kept down to a minimum.

Our high grade brushes do not contain any lubricating compound and are practically frictionless, and give the commutator that much desired polish which is indicative of perfect commutation.

All our brushes are fully guaranteed for the service for which they are recommended.

It is our earnest desire to cooperate in every way with our customers in order that they may secure efficient and economical service from their electrical equipment, and to this end we invite inquiries pertaining to carbon brushes or other carbon products which we manufacture.

We are specially equipped to make prompt shipments, and in cases of extreme necessity we can make partial shipment day following receipt of order.

Characteristics of all our grades are shown in our Catalogue, which will be mailed on request.

ADDRESS DEPT. "K."

A. F. DAUM

PITTSBURGH, PA

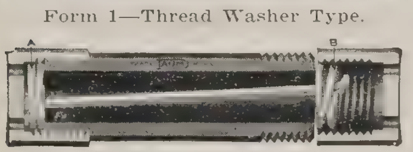
Sole Manufacturer of

The Daum Refillable Cartridge Fuse Shells

For Electric Light and Power

Below are illustrated our various forms of Type "B" Fuses. The following forms of fuses are made from 3 to 60 Ampere, 250 to 600 Volts, N. E. C., Dimensions.

Form 1—Thread Washer Type.



Form 2—Spring Washer Type.

Form 3—Cotter Wire Type.

Form 4—Strip or Wire Type—Strip recommended.

Our latest fuse strips are used, caps are removed by the twist of your wrist, fuse elements come in roll of ¼ lb. to roll, average 500 renewals to roll, 5-30 Amps. $2.00 per ¼ lb. 30-60 Amps. $1.00 per ½ lb. roll.

The following prices govern all Type "B" Fuses:

TYPE "B" 250 VOLTS

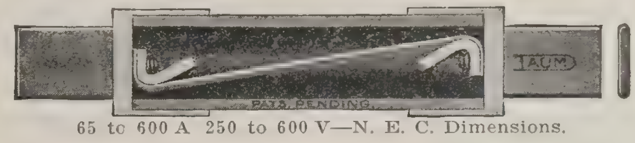
Catalog No.	Amps.	Length over all	Caps	Tubes	No. in package	List Price
33	3	2"	9/16"	½"	25	.30
34	4	2"	9/16"	½"	25	.30
35	5	2"	9/16"	½"	25	.30
36	6	2"	9/16"	½"	25	.30
38	8	2"	9/16"	½"	25	.30
39	10	2"	9/16"	½"	25	.30
40	15	2"	9/16"	½"	25	.30
41	20	2"	9/16"	½"	25	.30
42	25	2"	9/16"	½"	25	.30
43	30	2"	9/16"	½"	25	.30
90	30	3"	13/16"	¾"	25	.60
91	35	3"	13/16"	¾"	25	.60
92	40	3"	13/16"	¾"	25	.60
93	45	3"	13/16"	¾"	25	.60
94	50	3"	13/16"	¾"	25	.60
96	60	3"	13/16"	¾"	25	.60

TYPE "B"—600 VOLTS

161	1	5"	13/16"	¾"	10	.75
162	5	5"	13/16"	¾"	10	.75
163	10	5"	13/16"	¾"	10	.75
164	15	5"	13/16"	¾"	10	.75
165	20	5"	13/16"	¾"	10	.75
166	25	5"	13/16"	¾"	10	.75
167	30	5"	13/16"	¾"	10	.75
170	30	5½"	1 1/16"	1"	10	1.00
171	35	5½"	1 1/16"	1"	10	1.00
172	40	5½"	1 1/16"	1"	10	1.00
173	45	5½"	1 1/16"	1"	10	1.00
174	50	5½"	1 1/16"	1"	10	1.00
176	60	5½"	1 1/16"	1"	10	1.00

Auto Fuse (full size refillable)

Auto Fuse $30.00 per 100—Made in all sizes. Any size to order.



65 to 600 A 250 to 600 V—N. E. C. Dimensions.

Our latest style Type E, or knifeblade fuse, has been improved by having the copper blade with rounded edge cast into the cap. This makes a better finished article, easier to insert in the clips, and though our cost is considerably higher we have not increased the prices.

The hanger inside the tube has been strengthened by putting more metal of a specied mix in the body, making them more rigid.

TYPE "E" 250 VOLTS OR BLADE

Catalog No.	Amps.	Length over all	BLADES Wide	Thick	Diam. Tubes	No. in Pkg.	List Price
101	65	5⅞"	¾"	⅛"	1"	10	$1.65
103	75	5⅞"	¾"	⅛"	1"	10	1.65
105	85	5⅞"	¾"	⅛"	1"	10	1.65
107	100	5⅞"	¾"	⅛"	1"	10	1.65
110	105	7⅛"	1⅛"	3/16"	1½"	5	4.00
112	125	7⅛"	1⅛"	3/16"	1½"	5	4.00
114	150	7⅛"	1⅛"	3/16"	1½"	5	4.00
115	175	7⅛"	1⅛"	3/16"	1½"	5	4.00
116	200	7⅛"	1⅛"	3/16"	1½"	5	4.00
120	225	8⅝"	1⅝"	¼"	2"	2	7.00
121	250	8⅝"	1⅝"	¼"	2"	2	7.00
122	275	8⅝"	1⅝"	¼"	2"	2	7.00
123	300	8⅝"	1⅝"	¼"	2"	2	7.00
124	325	8⅝"	1⅝"	¼"	2"	2	7.00
125	350	8⅝"	1⅝"	¼"	2"	2	7.00
126	375	8⅝"	1⅝"	¼"	2"	2	7.00
127	400	8⅝"	1⅝"	¼"	2"	2	7.00
131	425	10⅝"	2"	¼"	2½"	2	8.00
133	475	10⅝"	2"	¼"	2½"	2	8.00
135	500	10⅝"	2"	¼"	2½"	2	8.00
137	550	10⅝"	2"	¼"	2½"	2	8 00
138	600	10⅝"	2"	¼"	2½"	2	8 00

TYPE "E" OR BLADE. 600 VOLTS

180	65	7⅞"	¾"	⅛"	1¼"	5	3.00
182	75	7⅞"	¾"	⅛"	1¼"	5	3.00
184	85	7⅞"	¾"	⅛"	1¼"	5	3.00
187	100	7⅞"	¾"	⅛"	1¼"	5	3.00
190	100	9⅝"	1⅛"	3/16"	1¾"	5	5.00
191	125	9⅝"	1⅛"	3/16"	1¾"	5	5.00
192	150	9⅝"	1⅛"	3/16"	1¾"	5	5.00
193	175	9⅝"	1⅛"	3/16"	1¾"	5	5.00
194	200	9⅝"	1⅛"	3/16"	1¾"	5	5.00
200	210	11⅝"	1⅝"	¼"	2½"	2	7.00
201	225	11⅝"	1⅝"	¼"	2½"	2	7.00
202	250	11⅝"	1⅝"	¼"	2½"	2	7.00
203	275	11⅝"	1⅝"	¼"	2½"	2	7.00
204	300	11⅝"	1⅝"	¼"	2½"	2	7.00
205	325	11⅝"	1⅝"	¼"	2½"	2	7.00
206	350	11⅝"	1⅝"	¼"	2½"	2	7.00
207	375	11⅝"	1⅝"	¼"	2½"	2	7.00
208	400	11⅝"	1⅝"	¼"	2½"	2	7.00

Submit sample of any old code fuse you are using and we will make it in a refillable type. This is an exclusive feature possible only with DAUM type of fuse.

We recommend for 60 Amp. Fuse or less, use Fuse Wires as follows:

Fuse Rating	Size of Wire Used	Not Pkcd.	10% Limit to Fuse	Current to fuse	Fused	No. of Wires Used
5 Amp	3A	No insulating filler used in our fuzes	5.5	6.8	6.25	one
10 Amp	5		11.0	12.3	12.5	one
15 Amp	8		16.5	16.5	18.8	one
20 Amp	6		22.0	22.2	25.0	two
25 Amp	8		27.5	28.2	31.2	two
30 Amp	10		33.0	33.3	37.5	two
40 Amp	15		44.0	44.1	50.0	two
50 Amp	25		55.0	62.0	62.5	two
60 Amp	30		66.0	69.0	75.0	two

From above tests it will be noted that all fuses are in accordance with the rulings of the National Board of Fire Underwriters, that is they all blow within the limits of 10% and 25% over their ratings.

Making due allowance for some variation in Commercial Fuse Wire in its melting point, the above tests can be depended to give perfect protection in the Daum Refillable Fuse Shells.

ECONOMY FUSE & MFG. CO.

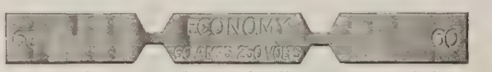
KINZIE & ORLEANS STS, CHICAGO

Manufacturers of

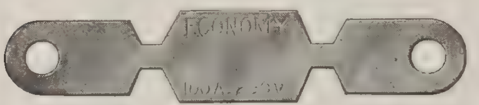
Economy Renewable Cartridge Fuses

Products

Economy Fuses are made in two general types (Ferrule and Knife Blade) with a full line of capacity ranges in both 250 and 600 Volts. The fusible elements are of the "Drop out" Renewal Link type, accurately rated and of definite design. Every part of an Economy Fuse is built on the "Safety First" principle, which means that the design is right from an electrical standpoint and that the material entering into the construction of the completed fuse is the best that money can buy.



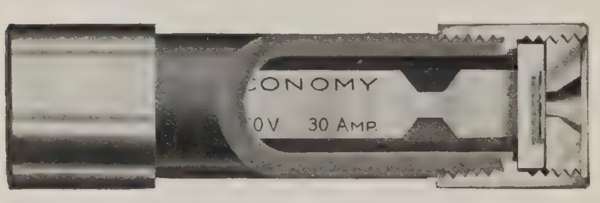
Ferrule Type "Drop Out" Renewal Link.



Knife Blade Type "Drop Out" Renewal Link.

Economy Fuses Save

Eighty per cent of fuse maintenance yearly as compared to the cost of securing adequate protection by the use of old-style, non-renewable fuses.



Sectional View—Ferrule Type Fuse.

Why They Use Economy Fuses

1. Economy Fuses meet the demand for fuse protection at a cost four-fifths below that of old, wasteful methods.

2. They are the only renewable fuses uniformly rated.

3. They provide the desired electrical characteristics under all conditions of use.

4. All capacities of renewal elements being readily available, it becomes unnecessary to carry large fuse stocks.

5. Renewal Elements are interchangeable within the capacity limits of each shell, giving maximum flexibility of stocks at minimum cost.

6. They never vent fire nor hold a sustained arc.

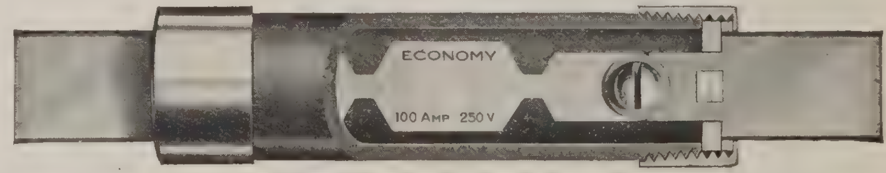
7. They meet the performance specifications governing the use of such devices.

Contracts

Many of the larger fuse users are now contracting with the manufacturers or jobbers of Economy Fuses for a full year's requirements. Cost thus being guaranteed, the saving for twelve month's fuse maintenance may be determined in advance.

Economy Fuse Users Include

Industrial plants, large corporations, light and power companies, mining and smelting companies, department and large stores, publishing companies, flour mills, food product plants, hotels, theatres, public buildings, steamships, wireless stations ashore and afloat and various departments of the United States Government.



Sectional View—Knife Blade Fuse—"Drop Out" Renewal Link In Place.

Samples

Any capacities sent on request, provided they are to be used for comparison and tests.

Complete Stocks Carried By All Leading Jobbers. Ask for Catalog 44 When Ordering Samples.

MONARCH REFILLABLE FUSE CO.

INCORPORATED

147-153 Leslie Street, Buffalo, N. Y.

Manufacturers of

Monarch Refillable Fuses
Monarch Refillable Fuse Plugs

Products

We manufacture a complete line of refillable fuses and fuse plugs.

Why Discard the Expensive Part?

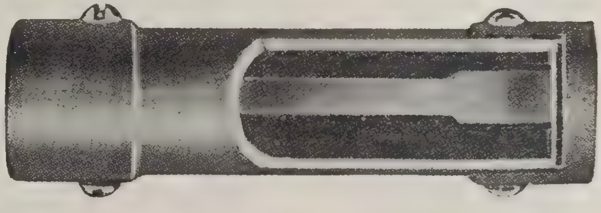
In the manufacture of fuses the fuse element is the least expensive item; it is the cartridge that costs the money—why throw it away and buy a new one every time a fuse blows?

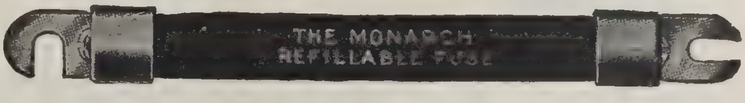
Monarch Refillable Fuses

ars so constructed that when they blow, the fuse element can be replaced; making virtually a new fuse at trifling cost and in a couple of minutes.

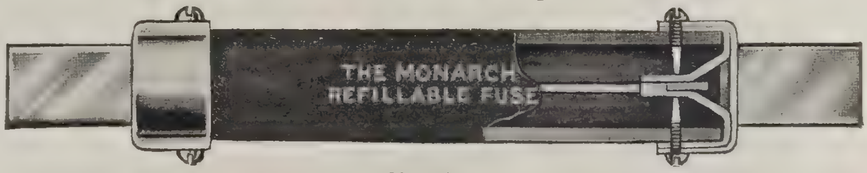
Illustrating Different Types

Ferrule Type.





Type A. 1 to 60 Amp. 600 Volt.



61 to 100 Amp. 600 Volt.

The Monarch Refillable Fuse Plug

Edison Base

No screws or tools needed to refill the Monarch Refillable Plug. It is simple in construction, serviceable, and a Money Saver.

The first cost is practically the only cost. Figure out for yourself just how much this will save you each year.

Made in all standard types and sizes and guaranteed to conform to underwriters' specifications as to rating and operating requirements.

Our system means a reduction of 75% to 90% in your fuse expense.

All Types—All Sizes

The Monarch Refillable Fuse is manufactured with ALL COPPER ends, and if you do not see the size outlined in our Catalog No. 2 or advertising matter, simply mail in a drawing of the exact length over all, the exact diameter of the cap, the ampereage and voltage of the fuse, and when our fuse is forwarded to you, it will fit into your standard blocks without any change, or, if your fuses are special, they will fit your special blocks.

All-Copper Ends

The Monarch Refillable Fuse is the only fuse manufactured with all-copper ends, as copper will not corrode when placed subject to moisture and gases, which are found in the mines.

Quick Detachable Ferrules

The ferrule type has the quick detachable ferrule, which is a time saver in the refilling, as time means money in keeping the electrical mine machinery in operation at all times.

Fuse Clips

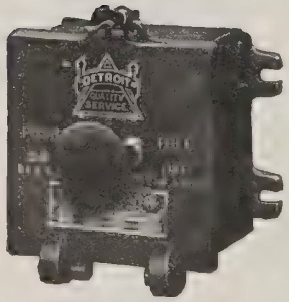
If you are using the old style fuses with the type "A" contacts and would like to equip your switchboard with the National Electric Code Standard Fuse Clips, we can furnish you with the clips, and you can mount them on your switchboard. Write in for full information regarding the "Monarch" All-Copper End Fuse.

WRITE FOR CATALOG NO. 2 BEFORE ORDERING FUSES

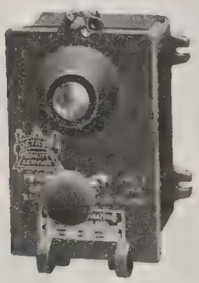
IRON CITY ELECTRIC CO.

PITTSBURGH, PA.

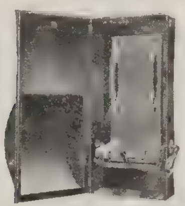
"Square D" Electrical Safety Devices for Controlling Electrical Equipment of Mines



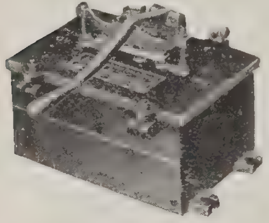
Catalog No. 7251.
Ironclad Fused Switch.



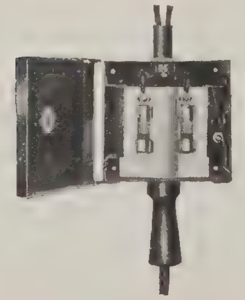
Catalog No. 7251 L.
Ironclad Fused Switch with Pilot Light.



Catalog No. 5263.
Steel Enclosed Switch.



Catalog No. 6351.
Ironclad Induction Motor Starter.



Catalog No. 5001.
Fused Plug Receptacle. Cover Open, Plug Inserted.

"Square D" Ironclad Fused Switches

Non-hazardous, all live parts being enclosed in a cast iron box with mechanism operated from outside box by a handle.

Switch mechanism is of the "quick-make" and quick-break" type—installations may be made where exposed to water, steam, fumes or dust, without injury to vital parts of switch.

Box cannot be opened while working parts are live.

Bulletin 40K gives complete data and prices.

"Square D" Steel Enclosed Switches

For use in mines for the prevention of accidents and advancement of "Safety-First" principles. Switch and Cutout completely enclosed in sheet steel box with hinged cover. Switch operates from outside of box by crank handle, and may be locked in "off" position when repairs or changes to equipment controlled by it are necessary.

Made in all standard capacities with removable and interchangeable end plates, and provided with convenient knockouts in sides.

Bulletin 37K gives complete information and prices.

"Square D" Ironclad Induction Motor Starters

"Square D" Induction Motor Starters are designed for use with motors up to and including 7½ horsepower, or those motors which may be started by switching them directly on to full voltage service. By their use it is possible to fuse these motors for their running load, the fuses being paralleled by removable short-circuiting bars which are in circuit with the fuses only when the switch is in the starting position. The switch may be sealed shut to protect it against tampering or the possible use of fuses of too large capacity.

Bulletin 41K gives complete information and prices.

NOTE: "Square D" Steel Enclosed Switches, "Square D" Ironclad Switches and "Square D" Induction Motor Starters bear the new Fire and Accident Label of the Underwriters' Laboratories. These are the first electrical devices permitted to use this new accident label service.

"Square D" Fused Plug Receptacles and Attachment Plugs

Receptacle made of sheet steel with fuses and terminals mounted on two porcelains, held in place within box by steel wedge. Terminals and contacts completely enclosed. End plate at bottom removable.

Plug is non-reversible polarity type, made of hardwood fitted with copper plates which make contact with terminals in receptacle.

Bulletin 42K gives complete data and prices.

"Arkless" Fuses—Mechanical Indicating

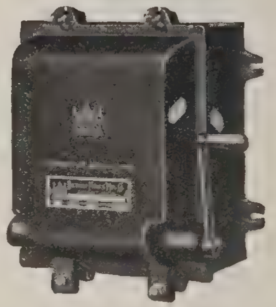
"Arkless" Fuses are correctly made and are noted for consistent performance in the work for which they are designed.

Knife-blade Type.

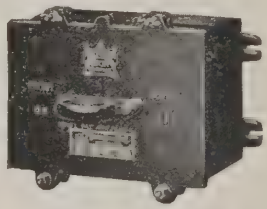
Spring Clip Type.

The mechanical indicator on "Arkless" Enclosed Fuses is guaranteed to give 100% "indication" even when installed in most unfavorable conditions—it is not affected by dampness, chemical action, nor long service. It is the only mechanical indicator on the market which is unconditionally guaranteed to indicate.

Bulletin 38K gives complete data and prices.

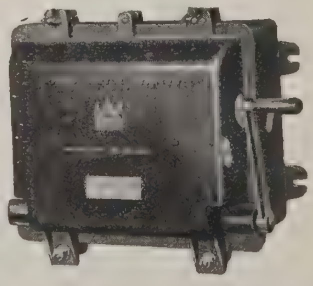


Catalog No. 7253.
Ironclad Fused Switch. Side Lever Type.



Catalog No. 7352.
Ironclad Fused Switch.

Catalog No. 5362.
Steel Enclosed Switch.



Catalog No. 6361.
Ironclad Induction Motor Starter. Side Lever Type.

Catalog No. 5001.
Fused Plug Receptacle. Plug Inserted.

KESTER ELECTRIC CO.

TERRE HAUTE, IND.

Manufacturers of

Dynamos, Motors and Switch Boards
General Electrical Mine Supplies

Products.

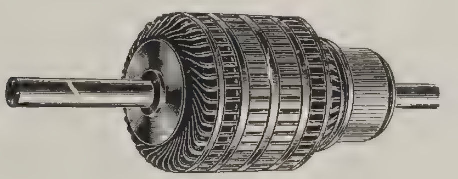
We manufacture armature coils, field coils, commutators, armature shafts, and brass castings, of all kinds. We rewind armature, field, induction and motor coils for all purposes, and specialize on secondhand machinery, all machinery is thoroughly overhauled and tested before leaving our shop. We repair all classes of machine or electrical equipments, used in or about a mine, also give special attention to elevator repair work.

General supplies carried in stock at all times: Lamps, arc and incadescent; bare and insulated wire, trolley fittings, trolley switches, general switchboard and cut-out switches; fuses of all types and sizes; carbon brushes.

Shop:

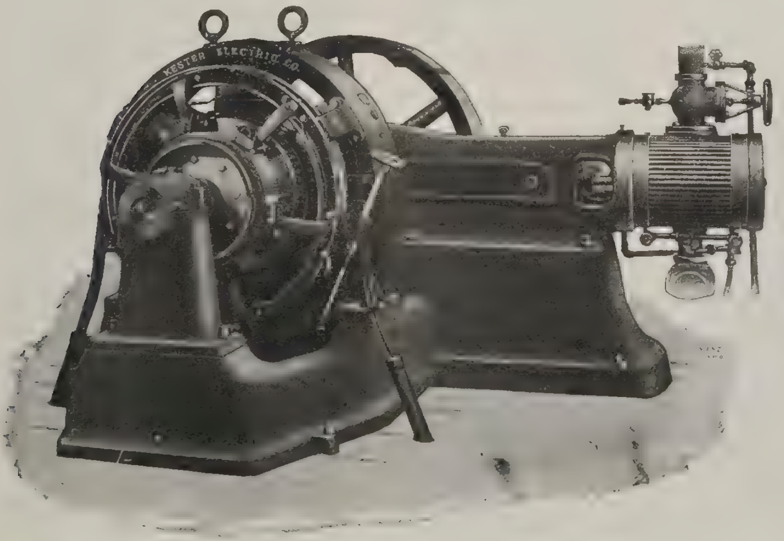
Kester Electric Co. is located 1000 to 1010 So. 14th St., Terre Haute, Indiana. Terre Haute, being located on three trunk lines, makes it one of the best shipping points in the central coal field. It gives advantage of getting freight back and forth with least possible delay.

We have manufactured electrical apparatus for the past 27 years and keep our shop filled with the most practical men in this line. We also furnish men for road work for engineing and erecting general construction.

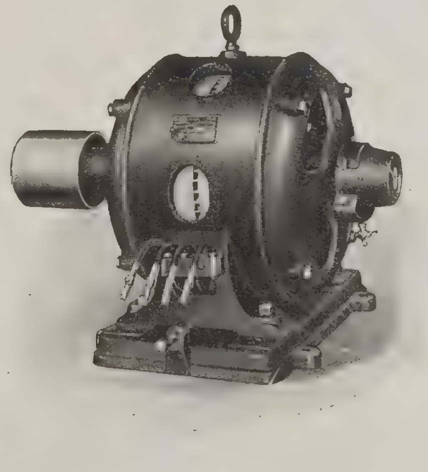


We specialize in armature rewinding.

We are in a position to furnish centrifugal pumps of any size or capacity that might be required, either engine or motor driven.



(Direct connected generator and engine).
Direct connected generator and engine, D. C. or A. C., furnished in all sizes from 5 to 500 K. W. Price upon application.



We are in position to furnish A. C. or D. C. motors from ½ to 500 H. P. Motors up to 50 H. P. carried in stock at all times. Prices upon application.

We pride ourselves on our efficient service and the number of satisfied customers.

MOLONEY ELECTRIC COMPANY

ST. LOUIS, MO.

FACTORIES:
ST. LOUIS, MO. WINDSOR, ONT.

DISTRICT OFFICES:
NEW YORK CHICAGO SAN FRANCISCO TORONTO, ONT. MONTREAL, P. Q. WINNIPEG, MAN.

Transformers For All Electrical Purposes

Our transformers have been on the market for the past twenty years and have met with universal success. During that period we have furnished transformers to all parts of the United States and all Foreign countries. Canadian trade is taken care of by our factory at Windsor, Ont.

Type H. E. 1 to 15 K. W. 2200 to 13200 Volts.

Type H. E. 20 to 100 K. W. 2200 to 13200 Volts.

Type F. 22000 to 33000 Volts. 10 to 100 K. W.

We furnish transformers in any voltage or size from 110 volts primary to 66,000 volts for both lighting and power service and for high transmission work.

The core loss and copper loss of Moloney Transformers is very low and the efficiencies very high.

Type C. 125 to 1000 K. W. 2200 to 33000 Volts.

The regulation is very close which is brought about through the use of special square and rectangular copper used throughout the construction.

The regulation is low and uniform; the windings are well ventilated in both the primary and secondary of our transformers permitting of a free circulation of oil through the entire transformer which results in a low and uniform temperature.

All mechanical details have been developed almost to a point of perfection. They are ruggedly built for excessive loads in connection with motor service.

A few illustrations on this page will only give a fair idea of our complete line which consists of all sizes from 1 to 5000 kilowatts, in both self-cooled and water-cooled types, for either 60 or 25 cycles and for any voltage as high as 66,000.

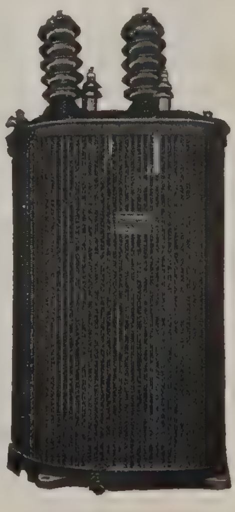
We have on hand at all times a large number of standard transformers in sizes as large as 50 kilowatts for intermediate voltages—larger sizes can be furnished promptly.

Our catalog and literature will describe more in detail our complete line.

You will find our prices, propositions and delivery attractive.

A list of your requirements sent to the above address will be appreciated.

Type T. 3 Phase, 2200 to 13200 Volts to 100 K. W.



66000 Volt Power Transformers.

CLEVELAND ARMATURE WORKS

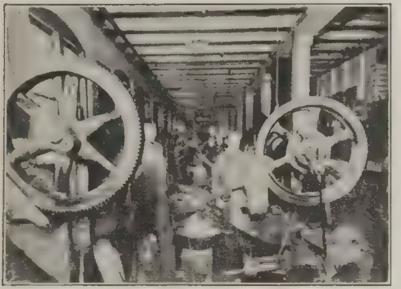
Cleveland, Ohio

Manufacturers of

Parts for repairing Electrical Machinery and Apparatus, all types. Complete Duplicate Armatures, Armature Shafts, Armature Discs, Armature Insulation, Oil Collars, End Plates and Nuts, Armature Coils, Armatures Rewound, Commutators Complete, Refilled or Assembled, Field Coils Complete, Repaired or Insulated, Brush Holders, Carbon Brushes.

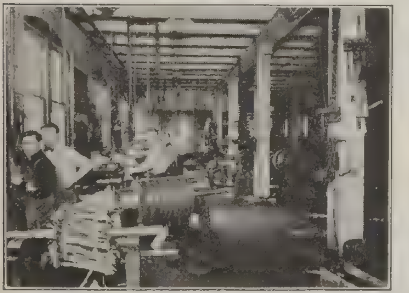
Our equipment consists of iron and wood working, armature, armature coil and field winding machinery, special and regular, of every kind necessary to a twentieth century rapid fire cost-reducing plant.

A corps of skilled mechanics, culled and picked from the general run of twenty years. A testing laboratory as complete as modern science has been able to produce. If practice makes perfect, we feel that our twenty years' experience in the repair business, our peep under the cover of practically every make of electric generator, dynamo and motor made, our coming in contact and repairing every conceivable kind of trouble, is of value to the user, both in keeping his machinery in working condition and lightening the pull on the purse string, notwithstanding the first cost, which may be slightly higher than others charge.



Disc Punching Machinery.

Machinery for General Work.



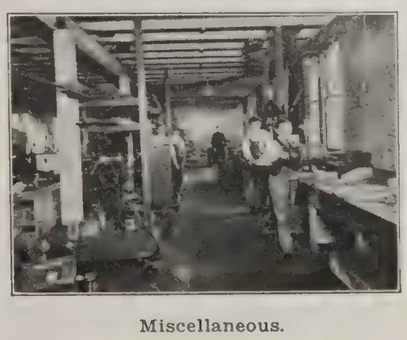
Armature Winding Department.

Armature, Coil and Field Winding.

Armature, Coil and Field Insulating Department.

Commutator Department.

Assembling Department.



Miscellaneous.

DUDLEY ELECTRIC & MACHINE CO.

Successors to
Uniontown Iron Works and Electric Company and Brownsville Electric Machine Company

Main Office and Shop:
UNIONTOWN, PA.

Branches:
BROWNSVILLE, PA.
CLARKSBURG, W. VA.

"We Never Sleep"

Electrical and Mechanical Repairs and Supplies

Products

We Manufacture Armature Coils; Armature Shafts; Commutators; Brass Castings; Special Machinery and repair parts.

We Wind Armatures; Fields; Induction Motors and Coils for all purposes.

We Specialize on Second Hand Machinery. All machines are thoroughly overhauled and tested before leaving our shop.

We Repair Boilers, Engines, Air Compressors, Pumps and Machinery of all kinds.

We Furnish and Install Power Plants; Hoisting, Haulage and Stationary Motors; New and second hand.

All work guaranteed.

Our Organization

is composed of men who are experts in their particular lines. It has always been the policy of this Company to secure and retain at any cost men whose experience in and about electrically operated mines render them especially capable of handling this class of work; by this means we have built up a highly efficient organization.

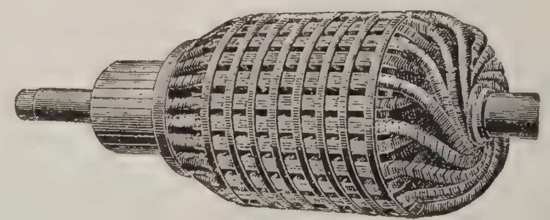
Location

Our main shop, at Uniontown, is located close to the several freight stations and express offices, and we have ideal facilities for handling heavy shipments, while our branch shops at Brownsville, Pa., and Clarksburg, W. Va., are maintained for the purpose of taking care of emergency work in their immediate localities.

Equipment

Our claim of superiority in this respect is based upon the fact that we have, in connection with our Electrical Repair Department, a modern Machine Shop equipped with machinery especially adapted for the work as outlined above, together with Blacksmith Shop, Acetylene Welding Apparatus, and Brass Foundry, including a modern tilting furnace, which enables us to get out Brass Castings to your orders on short notice.

Our Electric Department is equipped with the very latest machinery for the manufacturing of Armature Coils and Commutators. A Hydraulic Press for renewing armature shafts, locomotive axles, etc., while our methods of testing, treating and baking electrical apparatus; the results of a series of systematic experiments, based on observations through many years experience in and about mines, are best calculated to prolong the life and increase the efficiency of such apparatus when operating in damp, dusty and greasy places, and when subject to the severe duty which is quite frequently met with in mining operations.



Policy and Service

Our success is largely due to the fact that we have always maintained a policy of standing back of our work and seeing to it, that it gives service which is entirely satisfactory, although it may involve going beyond the terms of our liberal guarantee. Realizing fully the necessity of promptness in handling work of this kind we have arrangements, whereby we can work straight through night and day on break down and emergency jobs, and in addition to this we carry in stock a large assortment of armature coils, shafts, commutators, and other parts for standard machines, by means of which we are able to get work out very promptly.

We solicit your inquiries, welcome suggestions, invite criticism, and assure you that any and all correspondence will receive prompt and courteous attention.

THE ELECTRIC SERVICE CO., Inc.

212 Walnut Street, Cincinnati, Ohio

Electrical Repairs
New and Rebuilt Electrical Machinery

Products

Rewinding and rebuilding of electrical machinery. Specialists in heavy and difficult repairs.

Armature and Field Coils, new and reinsulated.

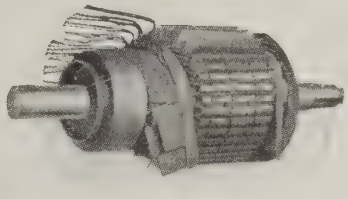
Repairers of Transformers and Manufacturers of Switchboards, etc.

Engineering

We have had twenty-six years of experience, both technical and practical, and are specializing and catering to the coal mining trade, and are prepared to do the heaviest and most difficult work, either in our shop, or at the mines or power plant. We have sent men to the mines to change the voltage from 550 volts to 250 volts. The men in our employ are particularly skilled along these lines, as evidenced by the New River Company letter which you will find reproduced below.

The few letters at the bottom of this page will give you an idea of what the people we work for think of us.

Repairing

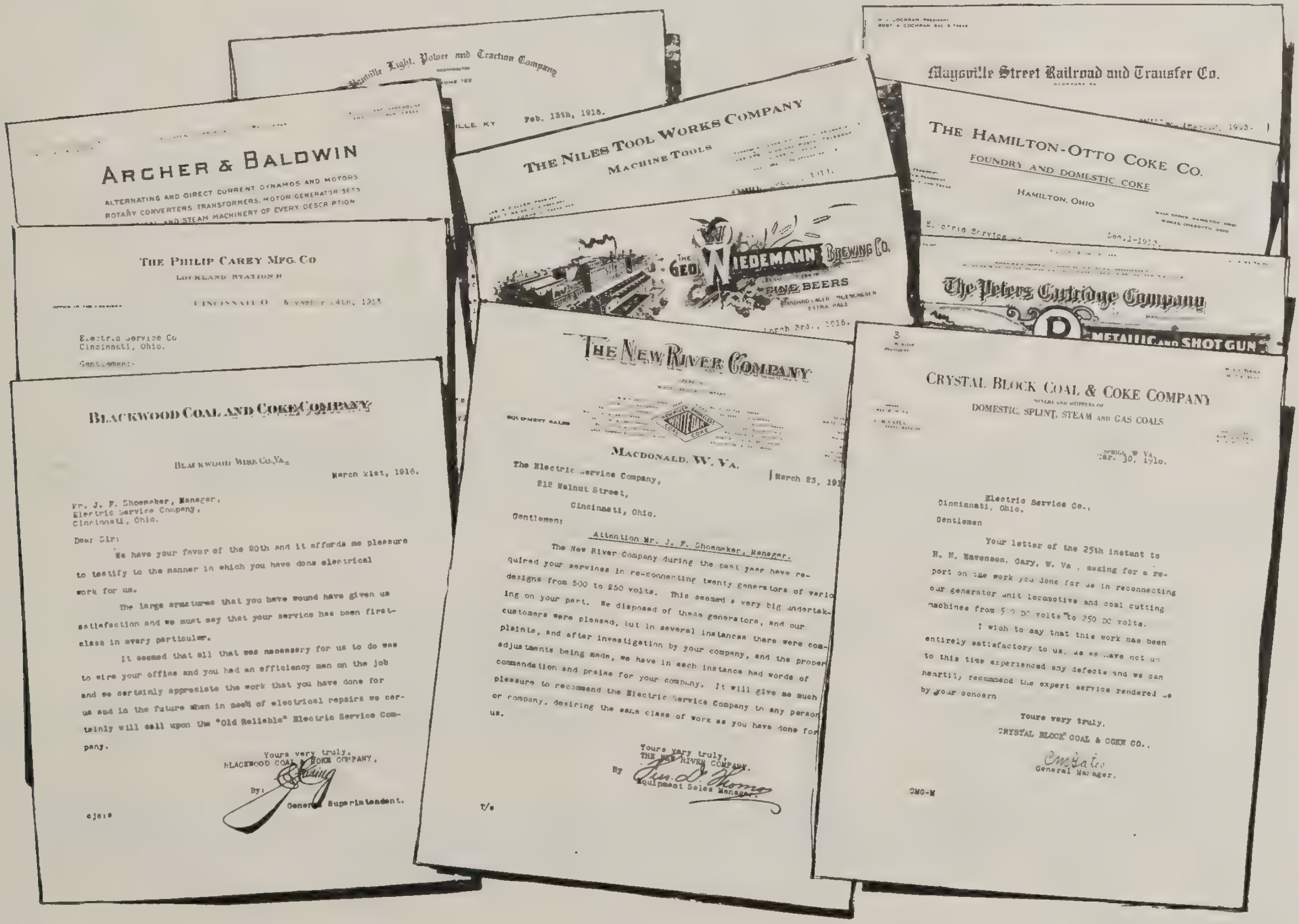


We have the largest and best equipped Repair Shop in the Middle West, and are particularly equipped to wind any class of armature or field coils, and to reinsulate and treat coils for all mining purposes; to repair and rewind transformers; in fact, any type of electrical mining repairs. All work done at our shop guaranteed in writing to be correct in every respect.

New and Second Hand Machinery

We carry a large, complete stock of new and rebuilt electrical machinery of all classes. All used machines sold by us are guaranteed to be O. K. in every respect, and we can save purchasers considerable money over the cost of new machinery.

Best of reference furnished.



Maysville Light, Power and Traction Company

Feb. 13th, 1916.

ARCHER & BALDWIN

ALTERNATING AND DIRECT CURRENT DYNAMOS AND MOTORS ROTARY CONVERTERS TRANSFORMERS, MOTOR GENERATOR SETS AND STEAM MACHINERY OF EVERY DESCRIPTION

THE NILES TOOL WORKS COMPANY

MACHINE TOOLS

Maysville Street Railroad and Transfer Co.

THE HAMILTON-OTTO COKE CO.

FOUNDRY AND DOMESTIC COKE

HAMILTON, OHIO

THE PHILIP CAREY MFG. CO

LOCKLAND STATION H

CINCINNATI, O.

Electric Service Co
Cincinnati, Ohio.

Gentlemen:-

THE GEO. WIEDEMANN BREWING CO.

FINE BEERS

The Peters Cartridge Company

METALLIC AND SHOT GUN

BLACKWOOD COAL AND COKE COMPANY

BLACKWOOD WISE CO. VA.

March 21st, 1916.

Mr. J. F. Shoemaker, Manager,
Electric Service Company,
Cincinnati, Ohio.

Dear Sir:

We have your favor of the 20th and it affords me pleasure to testify to the manner in which you have done electrical work for us.

The large armatures that you have wound have given us satisfaction and we must say that your service has been first-class in every particular.

It seemed that all that was necessary for us to do was to wire your office and you had an efficiency man on the job and we certainly appreciate the work that you have done for us and in the future when in need of electrical repairs we certainly will call upon the "Old Reliable" Electric Service Company.

Yours very truly,
BLACKWOOD COAL & COKE COMPANY,

By:
General Superintendent.

cje:s

THE NEW RIVER COMPANY

EQUIPMENT SALES

MACDONALD, W. VA.

March 23, 191

The Electric Service Company,
212 Walnut Street,
Cincinnati, Ohio.

Gentlemen:

Attention Mr. J. F. Shoemaker, Manager.

The New River Company during the past year have required your services in re-connecting twenty generators of vario designs from 500 to 250 volts. This seemed a very big undertaking on your part. We disposed of these generators, and our customers were pleased, but in several instances there were complaints, and after investigation by your company, and the proper adjustments being made, we have in each instance had words of commendation and praise for your company. It will give me much pleasure to recommend the Electric Service Company to any person or company, desiring the same class of work as you have done for us.

Yours very truly,
THE NEW RIVER COMPANY.

By
Equipment Sales Manager.

T/s

CRYSTAL BLOCK COAL & COKE COMPANY

MINERS AND SHIPPERS OF

DOMESTIC, SPLINT, STEAM AND GAS COALS

SPRIGG, W. VA.
Mar. 30, 1916.

Electric Service Co.,
Cincinnati, Ohio.

Gentlemen

Your letter of the 25th instant to H. N. Eavenson, Gary, W. Va., asking for a report on the work you done for us in reconnecting our generator unit locomotive and coal cutting machines from 500 DC volts to 250 DC volts.

I wish to say that this work has been entirely satisfactory to us, as we have not up to this time experienced any defects and we can heartily recommend the expert service rendered us by your concern

Yours very truly,
CRYSTAL BLOCK COAL & COKE CO.,

General Manager.

CMG-M

KEYSTONE CONSOLIDATED PUBLISHING COMPANY INC.
THE MINING CATALOG
COMBINED WITH
COAL FIELD DIRECTORY

EXPLOSIVE SECTION

Engineering Data

Definition of Permissible Explosives.
Classes of Permissible Explosives.
List of Permissible Explosives and Manufacturers.

The following manufacturers have catalogue descriptions in this section:

Aetna Explosives Co., Inc.
Atlas Powder Co.
Austin Powder Co.
Burton Powder Co.
Cordley & Hayes.
E. I. du Pont de Nemours and Company.
Hercules Powder Co.
King Powder Co.
Miners' Supply Co.
United States Powder Co.

For additional descriptions of Explosive Materials, not appearing in this section, refer to Index of Products in front of book.

Definition of Permissible Explosives

An explosive is called a permissible explosive when it is similar in all respects to the sample that passed certain tests by the United States Bureau of Mines, and when it is used in accordance with the conditions prescribed by this bureau.

But even the explosives that have passed those tests and are named in this list as permissible explosives are to be considered as permissible explosives only when used under the following conditions:

1. That the explosive is in all respects similar to the sample submitted by the manufacturer for test.
2. That detonators—preferably electric detonators—are used of not less efficiency than those prescribed, namely, those consisting by weight of 90 parts of mercury fulminate and 10 parts of potassium chlorate (or their equivalents).
3. That the explosive, if frozen, shall be thoroughly thawed in a safe and suitable manner before use.
4. That the quantity used for a shot does not exceed 1½ pounds (680 grams), and that it is properly tamped with clay or other non-combustible stemming.

It must not be supposed that an explosive that has once passed the required tests and has been published in lists of permissible explosives is always thereafter to be considered a permissible explosive, regardless of its condition or the way in which it is used. Thus, for example, an explosive named in the permissible list, if kept in a moist place until it undergoes a change in character, is no longer to be considered a permissible explosive. If used in a frozen or partly frozen condition, it is not when so used a permissible explosive. If used in excess of the quantity specified (1½ pounds), it is not, when so used, a permissible explosive. And when the other conditions have been met, it is not a permissible explosive if fired with a detonator of less efficiency than that prescribed.

Moreover, even when all the prescribed conditions have been met, no permissible explosive should necessarily be considered as permanently being a permissible explosive, but any permissible explosive when used under the prescribed conditions may properly continue to be considered a permissible explosive until notice of its withdrawal or removal from the list has been officially published, or until its name is omitted from a later list published by the Bureau of Mines.

Furthermore, the manufacturers of a permissible explosive may withdraw it at any time when introducing a new explosive of superior qualities. And after further experiments and conferences the Bureau of Mines may find it advisable to adopt addition and more severe tests to which all permissible explosives may be subjected, in the hope that through the use of such explosives only as may pass the more severe tests, the lives of miners may be better safeguarded.

LIST OF PERMISSIBLE EXPLOSIVES

Subject to the conditions and provisions stated above, the following explosives are classed as permissible explosives:

Permissible explosives tested prior to June 12, 1916

Brand.	Class designation.	When used with detonators, preferably electric detonators of not less efficiency than—	Unit deflective charge.	Rate of detonation in 1¼ by 8 inch cartridge.		Manufacturer.
			Grams.	Feet per second.	Meters per second.	
Aetna coal powder A	Class 4	No. 6	277	12,620	3,848	Aetna Explosives Co. (Inc.), New York, N. Y.
Aetna coal powder AA	Class 1a	do	241	7,880	2,403	Do.
Aetna coal powder B	Class 4	do	301	9,870	3,008	Do.
Aetna coal powder C	do	do	344	7,010	2,138	Do.
Aetna coal powder No. 2	Class 1a	do	212	9,280	2,830	Do.
Bental coal powder No. 1-A	do	do	278	7,690	2,343	Hercules Powder Co., Wilmington, Del.
Bental coal powder No. 2	do	No. 7	276	4,750	1,447	Do.
Bental coal powder No. 2-X	do	No. 6	280	7,980	2,432	Do.
Big Red No. 1	do	do	240	7,250	2,209	The Equitable Powder Manufacturing Co. and the Egyptian Powder Co., East Alton, Ill.
Big Red No. 2	do	do	255	10,850	3,309	Do.
Big Red No. 4	do	do	254	10,290	3,138	Do.
Big Red No. 6-L. F	do	do	242	7,480	2,280	Do.
Bituminite No. 1	Class 4	do	318	12,800	3,901	Aetna Explosives Co. (Inc.), New York, N. Y.
			294	9,330	2,843	
Bituminite No. 3	do	do				Do.
Bituminite No. 4	do	do	301	7,540	2,298	Do.
Bituminite No. 5	Class 1a	do	231	9,120	2,782	Do.
Bituminite No. 8-L. F	Class 4	do	303	9,300	2,834	Do.
Black Diamond No. 2-A	do	do	281	12,600	3,842	Illinois Powder Manufacturing Co., St. Louis, Mo.
Black Diamond No. 3-A	do	do	294	11,160	3,402	Do.
Black Diamond No. 5	Class 1a	do	288	6,020	1,835	Do.
Black Diamond No. 6-L. F	Class 4	do	306	9,630	2,935	Do.
Black Diamond No. 7	Class 1a	do	214	*10,730	3,270	Do.
Black Diamond No. 8	Class 4	do	295	8,730	2,663	Do.

Permissible explosives tested prior to June 12, 1916—Continued.

Brand.	Class designation.	When used with detonators, preferably electric detonators of not less efficiency than—	Unit deflective charge.	Rate of detonation in 1¼ by 8 inch cartridge.		Manufacturer.
			Grams.	Feet per second.	Meters per second.	
Cameron mine powder No. 1-A	Class 1a	No. 6	227	10,950	3,339	Cameron Powder Manufacturing Co., Emporium, Pa.
Cameron mine powder No. 2-A	do.	do.	230	*10,520	3,206	Do.
Cameron mine " No. 2-A. L. F	do.	do.	233	10,950	3,338	Do.
Cameron mine powder No. 3-A	Class 4	do.	296	10,930	3,333	Do.
Cameron mine powder No. 5-A	do.	do.	299	8,900	2,712	Do.
Carbonite No. 1	do.	do.	259	10,950	3,338	E. I. du Pont de Nemours & Co., Wilmington, Del.
Carbonite No. 2	do.	do.	302	11,380	3,470	Do.
Carbonite No. 2-L. F	do.	do.	305	7,830	2,387	Do.
Carbonite No. 3	do.	do.	325	8,710	2,656	Do.
Carbonite No. 4	do.	do.	327	7,670	2,339	Do.
Carbonite No. 5	do.	do.	304	10,140	3,092	Do.
Carbonite No. 6	do.	do.	345	7,490	2,285	Do.
Coalite X	Class 1a	do.	226	9,000	2,745	Atlas Powder Co., Wilmington, Del.
Coalite No. 1	Class 4	do.	296	7,930	2,418	Do.
Coalite No. 2-D	do.	do.	310	8,430	2,571	Do.
Coalite No. 2-D. L	do.	do.	271	7,340	2,237	Do.
Coalite No. 2-M. L. F	do.	do.	301	9,220	2,811	Do.
Coalite No. 3-X	Class 1a	do.	274	7,290	2,223	Do.
Coalite No. 3-XC	do.	do.	250	8,320	2,536	Do.
Coal special No. 1	Class 4	do.	288	11,800	3,598	Aetna Explosives Co. (Inc.), New York, N. Y.
Coal special N. 1-A	do.	do.	276	9,370	2,857	Do.
Coal special No. 1-L. F	do.	do.	277	8,280	2,524	Do.
Coal special No. 2	do.	do.	304	10,240	3,123	Do.
Coal special No. 2-W	do.	do.	277	11,590	3,534	Do.
Coal special No. 3-C	do.	do.	288	9,760	2,977	Do.
Collier powder B, N. F	Class 1a	do.	224	10,950	3,338	Do.
Collier powder KN	do.	do.	222	11,610	3,539	Do.
Collier powder No. X	do.	do.	273	7,820	2,384	Do.
Collier powder X, L. F	do.	do.	252	9,990	3,047	Do.
Collier powder No. 2	Class 4	do.	300	8,870	2,704	Do.
Collier powder No. 5	Class 1a	do.	240	8,280	2,524	Do.
Collier powder No. 5-L. F	do.	do.	232	9,370	2,858	Do.
Collier powder No. 5, special	Class 1a	No. 6	236	8,330	2,541	Aetna Explosives Co. (Inc.), New York, N. Y.
Collier powder No. 6-L. F	Class 4	do.	317	9,660	2,944	Do.
Collier No. 9	Class 1a	do.	283	6,690	2,040	Do.
Collier powder No. 11	do.	do.	217	11,680	3,561	Do.
Collier powder No. 11-L. F	do.	do.	226	10,850	3,307	Do.
Cronite No. 1	do.	do.	233	10,490	3,198	G. R. McAbee Powder & Oil Co., Pittsburgh, Pa.
Cronite No. 5	do.	No. 7	249	8,090	2,466	Do.
Detonite special	do.	do.	312	*10,840	3,305	The King Powder Co., Cincinnati, Ohio.
du Pont Lump Coal Powder No. 1	Class 4	No. 6	382	5,200	1,586	E. I. du Pont de Nemours & Co., Wilmington, Del.
du Pont Permissible No. 1	Class 1a	do.	278	9,610	2,930	Do.
Eureka No. 2	Class 2	do.	311	10,720	3,269	G. R. McAbee Powder & Oil Co., Pittsburgh, Pa.
Fort Pitt mine powder No. 1	Class 4	do.	293	11,230	3,424	Fort Pitt Powder Co., Pittsburgh, Pa.
Fuel-ite No. 1	do.	do.	288	11,150	3,400	Burton Powder Co., Pittsburgh, Pa.
Fuel-ite No. 2	do.	do.	289	8,240	2,512	Do.
Fuel-ite No. 3	Class 1a	do.	215	8,590	2,620	Do.
Giant coal-mine powder No. 5	do.	do.	228	10,230	3,118	Giant Powder Co (Con.), Giant, Cal.
Giant coal-mine powder No. 6	Class 2	do.	277	11,550	3,520	Do.
Giant coal-mine powder No. 7	do.	do.	245	10,830	3,301	Do.
Giant coal-mine powder No. 8	do.	do.	247	10,830	3,301	Do.
Guardian A	Class 4	No. 7	296	10,130	3,089	Hercules Powder Co., Wilmington, Del.
Guardian No. 2	Class 1a	No. 6	245	8,980	2,738	Do.
Guardian No. 2-X	do.	do.	245	7,990	2,437	Do.
Guardian No. 3	do.	do.	272	7,660	2,336	Do.
Guardian No. 3-X	do.	do.	252	8,470	2,582	Do.
Guardian coal powder B	Class 4	No. 7	310	8,960	2,733	Do.
Hecla No. 2	Class 1a	do.	253	13,990	4,264	E. I. du Pont de Nemours & Co., Wilmington, Del.
Hygrade coal powder No. 2	Class 4	No. 6	329	8,450	2,576	Hygrade Powder Co., Philadelphia, Pa.
Kanite A	Class 1b	No. 8	255	*10,730	3,270	W. H. Blumenstein Chemical Works, Pottsville, Pa.
Little Red No. 2	Class 4	No. 6	321	9,300	2,836	The Equitable Powder Manufacturing Co. and the Egyptian Powder Co., East Alton, Ill.

*1¾-inch cartridges used.

Permissible explosives tested prior to June 12, 1916—Continued.

Brand.	Class designation.	When used with detonators, preferably electric detonators of not less efficiency than—	Unit deflective charge.	Rate of detonation in 1¼ by 8 inch cartridge.		Manufacturer.
			Grams.	Feet per second.	Meters per second.	
Little Red No. 3	Class 4	No. 6	325	7,940	2,421	The Equitable Powder Manufacturing Co. and the Egyptian Powder Co., East Alton, Ill.
Little Red No. 4	....do	....do	349	8,100	2,467	Do.
Little Red No. 5-L. F.	....do	....do	300	11,110	3,387	Do.
Little Red No. 6-L. F.	....do	....do	333	7,650	2,331	Do.
Lomite No. 1	Class 2	....do	300	13,940	4,250	G. R. McAbee Powder & Oil Co., Pittsburgh, Pa.
Lowinite No. 2-B	Class 1a	....do	258	9,740	2,971	Lowinite Explosives Manufacturing Co., Pittsburgh, Pa.
Meteor AXXO	Class 2	....do	434	8,410	2,563	E. I. du Pont de Nemours & Co., Wilmington, Del.
Mine-ite A	Class 4	....do	296	11,290	3,443	Burton Powder Co., Pittsburgh, Pa.
Mine-ite A-2	....do	....do	319	10,670	3,252	Do.
Mine-ite B	....do	....do	340	9,540	2,908	Do.
Mine-ite B-2	....do	....do	334	7,410	2,260	Do.
Mine-ite No. 5-D	Class 1a	....do	241	8,720	2,658	Do.
Mine-ite No. 6-D	....do	....do	224	8,090	2,467	Do.
Miners Friend No.1	....do	....do	233	11,580	3,529	Atlas Powder Co., Wilmington, Del.
Miners Friend No. 2	....do	....do	260	10,330	3,149	Do.
Miners Friend No. 3	....do	....do	252	8,030	2,449	Do.
Miners Friend No. 4	....do	....do	261	9,980	3,044	Do.
Miners Friend No. 5	Class 1a	....do	250	8,570	2,614	Atlas Powder Co., Wilmington, Del.
Miners Friend No. 6	....do	....do	234	10,900	3,324	Do.
Miners Friend No. 7	....do	....do	253	8,950	2,729	Do.
Monobel No. 1	....do	....do	216	11,700	3,568	E. I. du Pont de Nemours & Co., Wilmington, Del.
Monobel No. 2	....do	....do	239	9,870	3,009	Do.
Monobel No. 3	....do	....do	243	7,260	2,212	Do.
Monobel No. 4	....do	....do	248	8,980	2,738	Do.
Monobel No. 5	....do	....do	267	6,760	2,061	Do.
Monobel No. 6	....do	....do	218	10,380	3,165	Do.
Monobel No. 7	....do	....do	211	10,050	3,065	Do.
Nitro low-flame No. 1	Class 4	....do	303	13,380	4,079	Nitro Powder Co., Kingston, N. Y.
Nitro low flame No. 2	....do	....do	298	14,560	4,439	Do.
Red H No. 1	Class 1a	....do	216	11,700	3,568	Hercules Powder Co., Wilmington, Del.
Red H No. 2	....do	....do	239	9,870	3,009	Do.
Red H No. 3	....do	....do	243	7,260	2,212	Do.
Red H No. 4	....do	....do	248	8,980	2,738	Do.
Red H No. 5	....do	....do	267	6,760	2,061	Do.
Red H No. 6	....do	....do	218	10,380	3,165	Do.
Red H No. 7	....do	....do	211	10,050	3,065	Do.
Red H No. 8	....do	....do	278	7,590	2,315	Do.
Trojan coal powder H	Class 3	....do	394	9,420	2,872	Pennsylvania Trojan Powder Co., Allentown, Pa.
Trojan coal powder I	....do	....do	410	9,620	2,934	Do.
Trojan coal powder J	....do	....do	360	10,590	3,230	Do.
Tunnelite AA	Class 1a	....do	253	7,690	2,346	G. R. McAbee Powder & Oil Co., Pittsburgh, Pa.
Tunnelite B	....do	....do	249	9,990	3,047	Do.
Tunnelite C	....do	....do	255	10,060	3,068	Do.
Tunnelite No. 3	Class 4	....do	291	10,110	3,083	Do.
Tunnelite No. 4	....do	....do	309	10,620	3,238	Do.
Tunnelite No. 5	....do	....do	328	8,400	2,562	Do.
Tunnelite No. 6	....do	....do	305	9,670	2,947	Do.
Tunnelite No. 6-L. F.	....do	....do	301	9,620	2,933	Do.
Tunnelite No. 7	....do	....do	311	8,720	2,659	Do.
Tunnelite No. 8	....do	....do	324	8,020	2,446	Do.
Tunnelite No. 8-L. F.	....do	....do	322	8,720	2,658	Do.
Vigorite No. 1	....do	....do	259	10,950	3,338	Atlas Powder Co., Wilmington, Del.
Vigorite No. 2	....do	....do	298	10,920	3,330	Do.
Vigorite No. 3	....do	....do	320	8,140	2,483	Do.
Vigorite No. 4	....do	....do	341	7,480	2,281	Do.
Vigorite No. 5	....do	....do	308	10,830	3,303	Do.
Vigorite No. 6	....do	....do	345	7,490	2,285	Do.
Xpdite No. 1	....do	....do	259	10,950	3,338	Hercules Powder Co., Wilmington, Del.
Xpdite No. 2	....do	....do	302	11,380	3,470	Do.
Xpdite No. 3	....do	....do	325	8,710	2,656	Do.
Xpdite No. 4	....do	....do	327	7,670	2,339	Do.
Xpdite No. 5	....do	....do	304	10,140	3,092	Do.
Xpdite No. 6	....do	....do	345	7,490	2,285	Do.

Definition of Permissible Explosives----Cont.

Unit Deflective Charge as Determined by the Ballistic Pendulum

The figures in the fourth column of the table show the weight in grams of the quantity of explosive that is required to swing the pendulum mortar the same distance as one-half pound (227 grams) of the standard 40 per cent "straight" nitroglycerin dynamite of the Pittsburgh Testing Station. Many observers have expressed the opinion that the "coal-getting" strength of permissible explosives is represented better by the results of this test than by the results of any other single test yet devised. The reader should note that the results do not take into consideration whether the coal when shot down is fine or coarse.

The Rate of Detonation

The table shows, in feet per second and meters per second, the relative velocity of detonation of the explosives. The adaptability of a permissible explosive to a particular coal-mining condition depends greatly on its rate of detonation. For certain work in which a shattering effect is desired, as in driving through or "brushing" rock, or in producing coal for coke making, the explosive reaction should be rapid, and for such work permissible explosives having a high rate of detonation should be selected. Similarly, for shooting down a soft friable coal to produce lump or steam coal, a permissible explosive should be selected that detonates slowly and hence gives a more prolonged pressure. In medium hard coal an explosive having an intermediate rate of detonation may be expected to be most suitable.

Although these relations usually hold, they do not always, because coals differ in hardness and coal beds differ in the number and position of the joints, partings, and shale bands. Such facts have to be considered in selecting an explosive for mining coal.

An explosive having a very low rate of detonation is not always the best for mining a soft friable coal, because some of its energy may be lost by its gases escaping through cracks and fractures in the bed. Under such conditions an explosive having an intermediate rate produces the most economical results.

Classes of Permissible Explosives

In order that the user of explosives may know the nature and characteristic component of each of the permissible explosives, and that he may be able to select an explosive to meet a specific requirement, the designation and characteristics of each class are given below:

Class 1, ammonium-nitrate explosives.—To class 1 belong all the explosives in which the characteristic material is ammonium nitrate. The class is divided into two subclasses. Subclass (a) includes every ammonium-nitrate explosive that contains a sensitizer that is itself an explosive. Subclass (b) includes every ammonium-nitrate explosive that contains a sensitizer that is not in itself an explosive. The ammonium-nitrate explosives of subclass (a) consist principally of ammonium-nitrate with small percentages of nitroglycerin, nitrocellulose, nitro-substitution compounds which are used as sensitizers. The ammonium-nitrate explosives of subclass (b) consist principally of ammonium-nitrate with small percentages of resinous matter or other non-explosive substances used as sensitizers.

All of the ammonium-nitrate explosives readily absorb moisture from the atmosphere, and great care should be taken in storing them or in using them in damp places. They are not suitable for use in wet mines. If in such mines a cartridge of an ammonium-nitrate explosive is opened and its contents exposed for only a few hours to the damp atmosphere, the explosive may deteriorate and later fail to detonate completely. The ammonium-nitrate explosives when stored in well-ventilated magazines for only a few months have shown signs of deterioration. For this reason the ammonium-nitrate explosives should be obtained in a fresh condition and should be used as soon as possible after their receipt. When fresh, these explosives, if properly detonated, have the advantage of producing only small quantities of poisonous and inflammable gases, and are adapted for mines that are not unusually wet, and also for mines and working places that are not well ventilated.

Class 2, hydrated explosives.—To class (2) belong all explosives in which salts containing water of crystallization are the characteristic materials. The explosives of this class are somewhat similar in composition to the ordinary low-grade dynamites, except that one or more salts containing water of crystallization are added to reduce the flame temperature. They are easily detonated, produce only small quantities of poisonous gases, and most of them can be used successfully in damp working places.

Class 3, organic nitrate explosives.—To class (3) belong all the explosives in which the characteristic material is an organic nitrate other than nitroglycerin. The permissible explosives listed under class (3) are nitrostarch explosives. They produce small quantities of poisonous gases on detonation.

Class 4, nitroglycerin explosives.—To class (4) belong all the explosives in which the characteristic material is nitroglycerin. These explosives contain free water or an excess of carbon, which is added to reduce the flame temperature. A few explosives of this class contain salts that reduce the strength and shattering effect of the explosives on detonation. The nitroglycerin explosives have the advantages of detonating easily and of not being readily affected by moisture. On detonation some of them produce poisonous and inflammable gases equal in quantity to those produced by black blasting powder, and for this reason they should not be used in mines or working places that are not well ventilated.

Courtesy Department of the Interior, Bureau of Mines.

AUSTIN POWDER COMPANY

CLEVELAND, OHIO

1229 Rockefeller Building

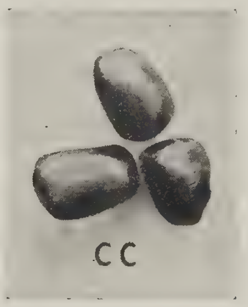
Established in
1833.

Factory at
FALLS JUNCTION, O.

Branch Offices at
DETROIT,
ST. LOUIS,
CHICAGO.

Blasting Powder, Dynamite, Blasting Supplies

CCC


CC

C

F

FF

FFF

FFFF

Austin Blasting Powder is manufactured of the best materials obtainable, and is of uniform quality and size. It is the standard powder for coal mining, and has been for many years. For other kinds of blasting it has no equal. It is made in seven sizes, and is calculated to meet every need in the blasting line, where Black Powder can be used at all.

Where High Explosives are required, we recommend "GOLD MEDAL" Dynamite, which is all that its name implies, and is manufactured in many different strengths, both in Nitro Glycerine and Ammonia grades. You are bound to get results by using "GOLD MEDAL."

A complete stock of "Gold Medal" Dynamite and Blasting Supplies is carried at Cleveland, and at our branch offices.

Our shipping facilities are unequaled, ensuring our customers prompt service at all times. Write for prices.

Gold Medal Dynamite

AETNA EXPLOSIVES COMPANY, Inc.

General Offices
120 BROADWAY, NEW YORK CITY

For any information write to our General Offices or to our nearest Branch Office.

Branch Offices
Ashley, Pa.
Birmingham, Ala.
Buffalo, N. Y.
Chicago, Ill.
Des Moines, Iowa.
Duluth, Minn.
Hazleton, Pa.
Louisville, Ky.
New Orleans, La.
Norristown, Pa.
Pittsburgh, Pa.
Pottsville, Pa.
St. Louis, Mo.

Factories
Dynamite
- Birmingham, Ala.
- Emporium, Pa. (2)
- Fayville, Ill.
- Ishpeming, Mich.
- Sinnamahoning, Pa.

Blasting Powder
- Birmingham, Ala.
- Goes, Ohio.
- Fayville, Ill.

Blasting Supplies
- Port Ewen, N. Y.
- Xenia, Ohio.

Manufacturers of

Permissible Powders, Dynamite, Black Powder and Blasting Supplies for all purposes

---

PERMISSIBLE POWDERS

For gaseous and dusty mines we recommend the use of Aetna Permissible Powders. The following table designates the kinds of Permissibles best adapted for use under conditions here specified.

WET WORKINGS

Aetna Coal Powder A
Aetna Coal Powder B
Aetna Coal Powder C
Aetna Coal Powder D
Coal Special No. 1
Coal Special No. 2
Coal Special No. 2-W
Coal Special No. 3-C
Coal Special No. 1-A
Coal Special No. 1-LF
Bituminite No. 1
Bituminite No. 3
Bituminite No. 4
Bituminite No. 8-LF
Collier Powder No. 2

DRY WORKINGS

Aetna Coal Powder AA
Aetna Coal Powder No. 2
Bituminite No. 5
Collier Powder No. 5
Collier Powder No. 5 Special
Collier Powder No. 5-LF
Collier Powder No. 6-LF
Collier Powder No. 9
Collier Powder No. 11
Collier Powder No. 11-LF
Collier Powder X
Collier Powder XLF

HARD WORKINGS

Where quick-acting powder is required and high percentage of lump is not considered.

Bituminite No. 1
Aetna Coal Powder A
Coal Special No. 1
Collier Powder No. 11

SOFT WORKINGS

Where slow-acting powder is required and greatest percentage of lump is desired.

Collier Powder No. 9

Collier Powder X

Aetna Coal Powder C

Bituminite No. 4

POOR VENTILATION

Aetna Coal Powder No. 2

Bituminite No. 5

Collier Powder No. 5

Collier Powder No. 5 Special

Collier Powder XLF

Collier Powder No. 5-LF

In mines free from gas and dust, where ventilation is good and lump coal is desired, Aetna Black Blasting Powder can be used to good advantage. If the ventilation is poor, and less lump is required, Aetna Gelatin, Aetna Standard (Ammonia) and Aetna Low Freezing Standard (L. F. Ammonia) brands of Dynamite are recommended.

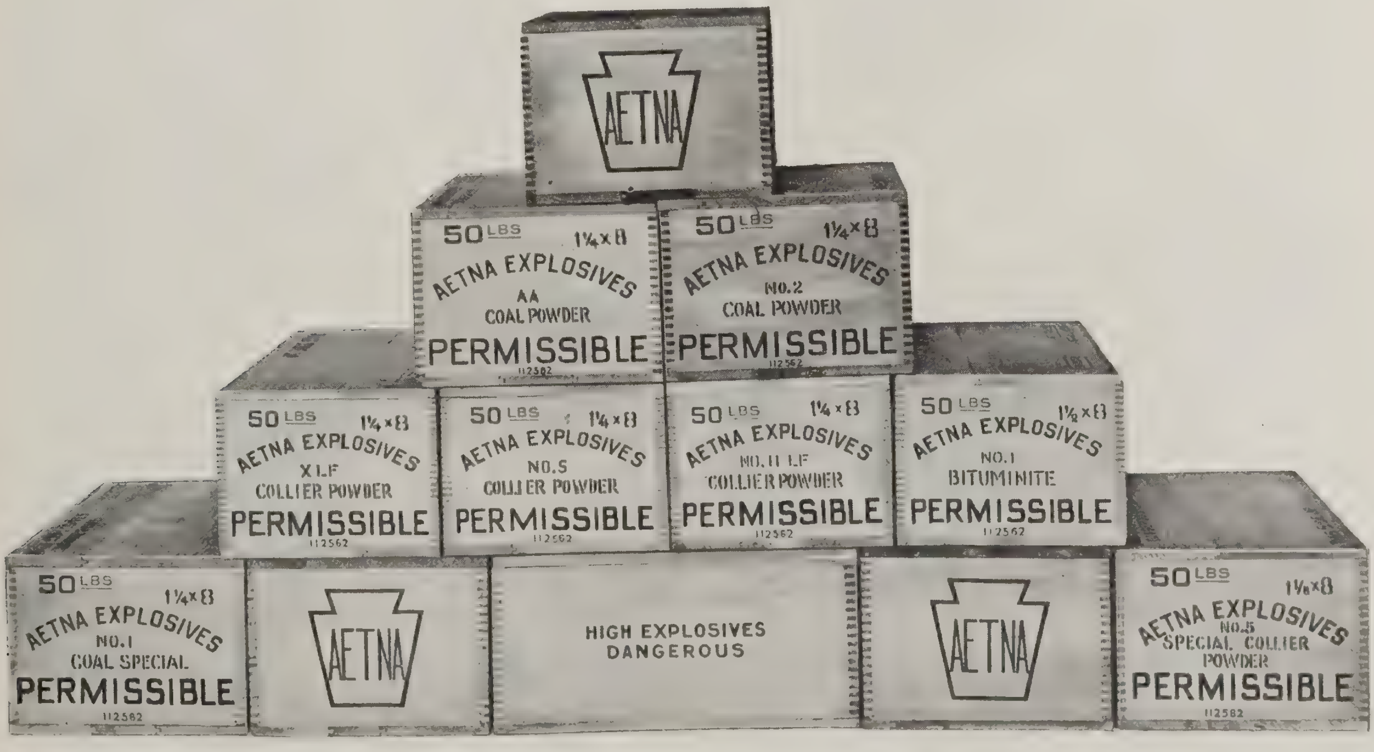
All Aetna Permissible Powders have been passed by the Bureau of Mines, Department of the Interior, U. S. Government.

Black Blasting Powder

Aetna Black Blasting Powder is made in seven standard granulations, ranging from FFFF, or the finest and quickest burning, to CCC, or the coarsest and slowest burning. Black Blasting Powder is admirably adapted for use where Mines are free from gas and dust and where lump coal is desired.

Blasting Supplies

Aetna "Lion" Brand Blasting Caps, Electric Blasting Caps, Blasting Machines, Galvanometers and Rheostats; Fuse, Cap Crimpers, Leading Wire and Connecting Wire promptly shipped direct from factories or from well-stocked magazines at our various distributing points.


AETNA
50 LBS 1¼×8 AETNA EXPLOSIVES AA COAL POWDER PERMISSIBLE
50 LBS 1¼×8 AETNA EXPLOSIVES NO.2 COAL POWDER PERMISSIBLE
50 LBS 1¼×8 AETNA EXPLOSIVES XLF COLLIER POWDER PERMISSIBLE
50 LBS 1¼×8 AETNA EXPLOSIVES NO.5 COLLIER POWDER PERMISSIBLE
50 LBS 1¼×8 AETNA EXPLOSIVES NO.11 LF COLLIER POWDER PERMISSIBLE
50 LBS 1¼×8 AETNA EXPLOSIVES NO.1 BITUMINITE PERMISSIBLE
50 LBS 1¼×8 AETNA EXPLOSIVES NO.1 COAL SPECIAL PERMISSIBLE
AETNA
HIGH EXPLOSIVES DANGEROUS
AETNA
50 LBS 1¼×8 AETNA EXPLOSIVES NO.5 SPECIAL COLLIER POWDER PERMISSIBLE

ATLAS POWDER CO.

WILMINGTON, DEL.

Blasting Explosives Blasting Supplies

Atlas Permissible Explosives for Gassy and Dusty Coal Mines

Damp proof—Not water proof. No harmful smoke or fumes. Sensitive to No. 6 Detonator.

Miners Friend—6 Grades.

Miners Friend No. 1 (High Freezing); Miners Friend No. 6 (Low Freezing); Very Strong and Medium Slow.

Miners Friend No. 2 (High Freezing); Miners Friend No. 4 (Low Freezing); Very Strong and Slow.

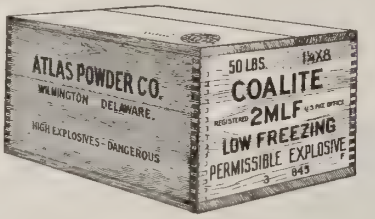
Miners Friend No. 3 (High Freezing); Miners Friend No. 5 (Low Freezing); Very Strong and Very Slow.

Coalite—6 Grades.

Coalite No. 1 (High Freezing) Strong and Slow.

Coalite 2D (High Freezing); Coalite 2 MLF (Low Freezing); Coalite 3XC (High Freezing); Medium Strong and Slow.

Coalite 2DL (High Freezing) Medium Strong and Very Slow.



Coalite X (High Freezing) Very Strong and Slow.

Vigorite—6 Grades.

Vigorite No. 1 (High Freezing).

Vigorite No. 2 (High Freezing); Vigorite No. 5 (Low Freezing); Strong and Medium Slow.

Vigorite No. 3 (High Freezing); Vigorite No. 6 (Low Freezing); Medium Strong and Medium Slow.

Vigorite No. 4 (High Freezing) Medium Strong and Very Slow.

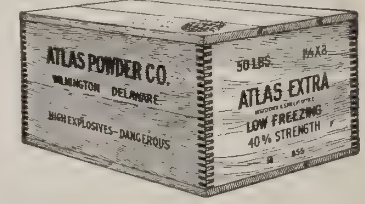
Put up in cartridges ⅞ in. x 8 in. to 1¾ in. x 8 in. and packed in 25 lb. and 50 lb. cases.

Dynamite

Each strength and kind made either high or low freezing. Sensitive to No. 6 Detonator.

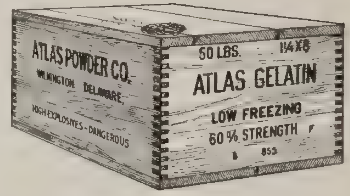
Atlas Extra—20% to 60%.

Spreads and heaves when exploded. Fumes not objectionable. Not waterproof. For headings, strippings, cuts and other rock or coal blasting that is not wet or gassy.



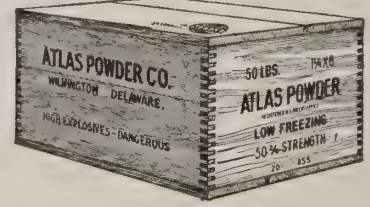
Atlas Gelatin—35% to 100%.

Almost non-freezing. Practically fumeless. Waterproof. For tunnel driving and rock blasting of all kinds in mines or under water.



Atlas Powder—20% to 60%.

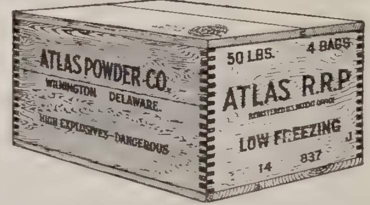
Very quick and shattering. Fumes objectionable under ground. Partly waterproof. For outside work in hard rock that must be broken small.



Low Powder

Atlas Low Freezing R. R. P.

A granular, low grade explosive invaluable in cuts, strippings or other open excavating that is not wet. Twice as strong as blasting powder. Exploded with a dynamite primer. Put up in 12½ lb. paper bags, packed in 50 lb. cases.


ATLAS POWDER CO.
WILMINGTON DELAWARE.
HIGH EXPLOSIVES-DANGEROUS
50 LBS. 4 BAGS
ATLAS R.R.P.
LOW FREEZING

Atlas Blasting Powder

All Standard granulations from FFFF to CCC. The smaller the grain the quicker and more shattering the powder.

Hard pressed, dense, regular, moisture-resisting grains. Little smoke. Glazed or unglazed. Packed in 25 lb. kegs and 5 lb. cans.

ATLAS POWDER CO.
MFR.
WILMINGTON, DEL.
U.S.A.
25 LBS.
EXPLOSIVE
DANGEROUS
BLACK BLASTING POWDER

U. S. Standard Blasting Machines

This is a light weight blasting machine, especially made for coal mining where it is not necessary to fire more than two or three charges at a time. It has a capacity of 3 copper wire electric fuzes. It weighs 4½ pounds. It is furnished with a removable handle which prevents its being operated by any other person than the blaster. It is equipped with two posts only.

Atlas Little Giant.

No. 3.

Standard size for quarry and mine. Capacity 30 copper wire electric fuzes. Weight 25 pounds. Regularly equipped with two posts. A strong, substantially built machine that can be depended on to develop its maximum capacity if kept dry and operated with full force.

No. 6.

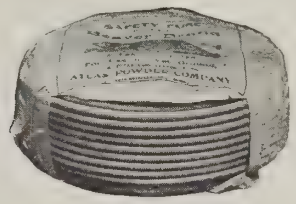
This blasting machine, while operated like the others, is of a different type, embodying many refinements of design, giving a machine of great power and light weight. It has a capacity of 150 copper wire electric fuzes, and is, by far, the most powerful blasting machine made. It has two posts and weighs only 37 pounds.

Fuse

Wrapped in rolls of 100 feet. Ten to sixty rolls to the case.

For Wet Work
"CHARTER OAK"

For Wet Work
"CLOVER"



For Dry or Damp Work
"Beaver"

Galvanometers and Rheostats

Atlas Galvanometer for Testing Blasting Circuits.

Atlas Rheostat for Testing Blasting Machines.

Insulated Copper Leading Wire and Connecting Wire

Coil of Leading Wire.

Spool of Connecting Wire.

Leading Wire—250 ft. and 500 ft. Coils. Weighs about 9½ lbs. per M ft.

Connecting Wire—1 lb. and 2 lb. Spools. About 210 ft. to the pound.

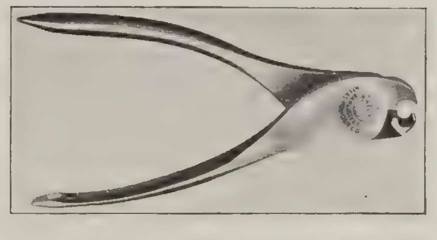
Leading and connecting wire are sold by the pound.

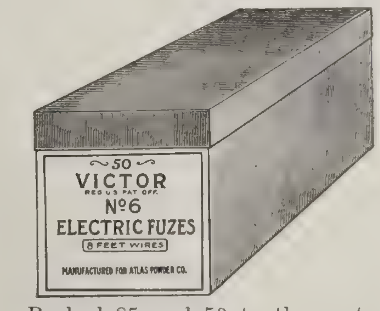
Victor Electric Fuzes—No. 6, No. 8. Copper or Iron Wires.

Blasting Caps—No. 6, No. 8.

Packed 25 or 100 to the tin box—500 to 5,000 to the case.

Atlas Cap Crimpers


The only safe, secure and reliable way to attach a blasting cap to fuse is with a cap crimper.



Packed 25 and 50 to the carton—ten cartons to the case. Wires 4 ft. to 30 ft. long.

BRANCH OFFICES:

BOSTON, MASS.
NEW YORK, N. Y.
PHILADELPHIA, PA.
ALLENTOWN, PA.
POTTSVILLE, PA.
WILKES-BARRE, PA.
PITTSBURGH, PA.
KNOXVILLE, TENN.
McALESTER, OKLA.
NASHVILLE, TENN.
MEMPHIS, TENN.
BIRMINGHAM, ALA.
NEW ORLEANS, LA.
JOPLIN, MO.
ST. LOUIS, MO.
KANSAS CITY, MO.
PITTSBURG, KAN.
HOUGHTON, MICH.

E. I. du Pont de Nemours and Company

General Offices:—WILMINGTON, DEL.

MANUFACTURERS OF

Permissible Explosives, Blasting Powder and Blasting Supplies

EXPLOSIVES FOR ALL PURPOSES

Branch Offices:
BIRMINGHAM, ALA.
CHICAGO, ILL.
DENVER, COLO.
DULUTH, MINN.
HUNTINGTON, W. VA.
MEXICO CITY, MEXICO.
NEW YORK, N. Y.
BUFFALO, N. Y.
PITTSBURGH, PA.
SAN FRANCISCO, CAL.
SEATTLE, WASH.
PORTLAND, OREGON.
SPOKANE, WASH.
JUNEAU, ALASKA.
ST. LOUIS, MO.
SCRANTON, PA.

Works:

Blasting Powder.
AUGUSTA, COLO.
MONTCHANIN, DEL.
BIRMINGHAM, ALA.
FAIRCHANCE, PA.
MOOAR, IOWA.
NEMOURS, W. VA.
WAYNE, N. J.
WILPEN, MINN.
STORRS JCT., PA.
JERMYN, PA.
MOOSIC, PA.
LAUREL RUN, PA.
GRACEDALE, PA.
DU PONT, WASH.

Permissibles.
ASHBURN, MO.
DU PONT, WASH.
EMPORIUM, PA.
LOUVIERS, COLO.
GIBBSTOWN, N. J.

Blasting Supplies.
POMPTON LAKES, N. J.

Products

For Coal Mine Use: Monobel and Carbonite Permissible Explosives, Du Pont Blasting Powder and Blasting Supplies.

Quality and Service

The Du Pont Company has been making explosives since 1802,—114 years. It has but one standard of quality for its products,—the highest.

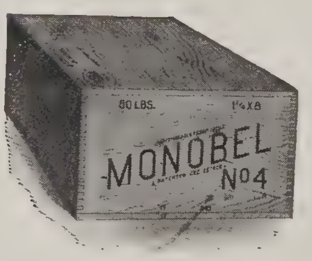
Extensive experimental and testing laboratories are maintained to keep Du Pont products apace with the most modern explosive requirements.

The number and location of its works and its extensive system of storage magazines assure prompt delivery.

Monobel Permissible Explosives

(Passed U. S. Govt. tests.)

For use in gaseous and dusty coal mines that are not very wet. They are practically fumeless when properly detonated. (Require a Du Pont No. 6 blasting cap or electric blasting cap.) Give off very little smoke and fumes.



Monobel No. 4

(Low-freezing). For blasting hard coal this grade is much better than blasting powder or dynamite, because it makes no injurious smoke or fumes, and because, after a little practice, a miner can mine the coal cheaper. It is a little slower in its action than Monobel No. 6. Monobel No. 4 will rarely freeze even in the coldest weather. Requires no thawing.

Monobel No. 5

(Low-freezing). Especially adapted to mining lump coal. It is just as strong as Monobel No. 4 but is so much slower acting that miners who have learned how to use it can mine the softest coal without breaking or shattering it any more, and at no greater expense, than if blasting powder is used. Monobel No. 5 rarely freezes no matter how cold the weather. Requires no thawing.

Monobel No. 6

(Low-freezing). Intended particularly for hard coal, hard-shooting soft coal, soft coal which is to be coked, and blasting top and bottom rock. It is a little quicker than Monobel No. 4. Requires no thawing.

Monobel Nos. 1, 2, and 3

Are the same as Monobel Nos. 6, 4 and 5 respectively, except that they (Nos. 1, 2, 3) are not low-freezing. Monobel Nos. 1 and 2 require no thawing, but Monobel No. 3, if frozen, must be thawed before being used.

Du Pont Testing Gallery for Permissible Explosives at Gibbstown, N. J.

This is the only testing gallery in the United States for testing Permissible Explosives, maintained on a scale equal to that of the United States Government testing gallery at Pittsburgh.

Carbonite Permissible Explosives

(Passed U. S. Govt. tests.)

For very wet work in gaseous and dusty coal mines. Unless the work is exceptionally wet there is no disadvantage in slitting the Carbonite cartridge if the shot is fired immediately. Gives off a little more smoke and fumes than Monobel but much less than blasting powder or dynamite.

Carbonite No. 1

Is quick acting, for use in anthracite coal and bituminous coal which it is desired to shatter for coking purposes. It gives the most shattering effect of all the Carbonite grades. Freezes between 45° and 50° F. When frozen, must be thawed before using.

Carbonite No. 4

Is about 20% slower in velocity of detonation than Carbonite No. 3. Its shattering effect is the least of any of the Carbonites. It is slightly denser than Carbonite No. 3 but not quite so dense as Carbonite No. 1. In water resisting properties, strength and fumes, it is equal to Carbonite No. 3. Freezes between 45° and 50° F. When frozen must be thawed before using.

Carbonite No. 5

(Low-freezing). Its shattering effect is less than Carbonite No. 1. Will often not require thawing even if subjected to temperatures considerably below 35° F.

Carbonite No. 6

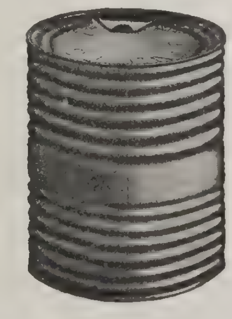
(Low-freezing). This grade is quite slow in action. Should be used in all softer and more friable bituminous coal where lump coal is desired. Its shattering effect is less than either Carbonite No. 1 or Carbonite No. 5. Will often not require thawing even if submitted to temperatures considerably below 35° F.

Carbonites Nos. 2 and 3 are the same as Carbonites Nos. 5 and 6, respectively, except that they (Nos. 2 and 3) are not low-freezing. Carbonites Nos. 2 and 3 freeze between 45° and 50° F.

When frozen all Carbonites must be thawed before using.

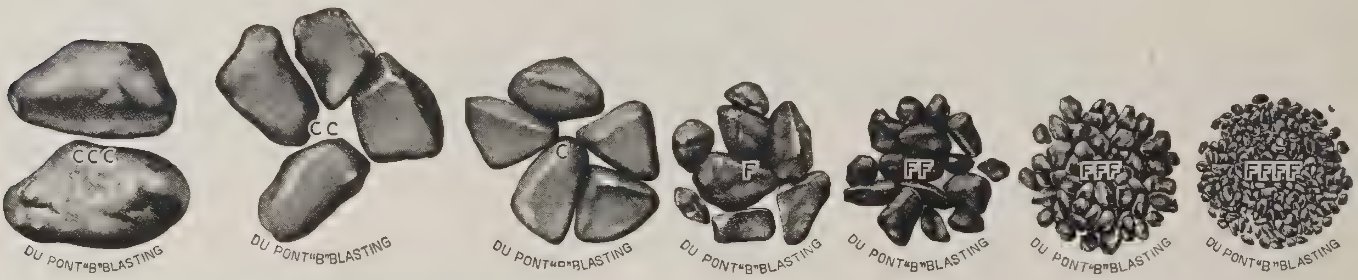
Du Pont Blasting Powder

Where mine gas and coal dust are not present in dangerous quantities, the most economical and satisfactory explosive for use in coal mines is B Blasting Powder.



Blasting powder is made in but one strength,—its adaptability to different kinds of work being controlled by regulating its quickness of action. This is accomplished by producing it in grains of different sizes. The finer granulations are much quicker and have a greater breaking and shattering effect than the coarser ones, which latter have more of a tendency to lift and heave the coal out in large lumps.

Du Pont B Blasting Powder is made in seven standard granulations ranging from CCC (coarse) to FFFF (fine). This range of grain sizes insures the coal miner surely finding a size granulation that will just suit his particular work. The greatest care is exercised to insure only the purest and best of raw materials entering into the manufacture of Du Pont Blasting Powder. Our men are the most skilled and experienced powder-makers in the world. Our mechanical equipment is the most modern, insuring perfect incorporation of materials. A system of rigid inspection during the whole course of manufacture, and of the finished product, makes certain that the user of Du Pont Blasting Powder will receive an explosive as perfect as human skill and intelligence can make.



Standard Granulations of Du Pont Blasting Powder.

Monobel Shot in an Alabama Coal Mine.

DU PONT BLASTING SUPPLIES

Too much stress can hardly be laid on the importance of using reliable blasting supplies. The best supplies cost but a trifle in comparison with the value of the explosives with which they are used. Poor supplies frequently result in waste of the explosive and loss of life through partial or complete failure to detonate.

We know that the blasting supplies we manufacture and sell are absolutely reliable. Use them and they will bring out the best of which your explosives are capable; if you use Du Pont Blasting Supplies with Du Pont Explosives, you have the ideal combination for maximum efficiency, low cost and general all-round satisfaction.

- Electric Blasting Caps
- Delay Electric Blasting Caps
- Delay Electric Igniters
- Connecting Wire
- Leading Wire
- Blasting Machines
- Galvanometers (for testing blasting circuits)
- Rheostats (for testing blasting machines)
- Leading Wire Reels
- Electric Squibs
- Blasting Caps
- Fuse
- Cap Crimpers
- Thawing Kettles
- Tamping Bags
- Blasting Mats

Special Literature

One or all of the following booklets will be freely sent on request to anyone interested in the use of explosives: "Permissible Explosives," "Blasting Powder" and "Blasting Supplies." In addition to the data about our own products, these books contain much general information of great value to technical and practical men who have occasion to use or buy explosives and supplies.

Du Pont Blasting Machines

We describe and illustrate two of several types of blasting machines. A descriptive folder giving capacity, weight and price of all DU PONT BLASTING MACHINES sent on request.

No. 3 Machine

Standard size for quarry and mine. Capacity 30 electric blasting caps with copper wires. Weight 25 pounds. Regularly equipped with two posts. Due to its size this blasting machine can be easily operated with best results. It is recommended for all general blasting operations, where a larger blasting machine is not necessary, and even where a smaller one, except the pocket blasting machine, will do the work.

Pocket Size

This is a light weight machine, especially made for coal mining, where it is not often required to fire more than one or two charges at a time. It has a capacity of 3 electric blasting caps. It weighs 4½ pounds. It is furnished with a removable handle, which prevents its being operated by any other person than the blaster. It is equipped with two posts only. When operating, the handle hould be given a sharp, quick twist.

No. 3 Machine.

Pocket Machine.

Du Pont Electric Blasting Caps

Are made in two strengths, No. 6 and No. 8, having both insulated copper and iron wires. Copper wires are carried in stock in lengths from 4 feet to 30 feet, but longer lengths may be secured on special orders. Iron wires range in lengths from 2 feet to 8 feet,—longer lengths not being recommended on account of the high electrical resistance of iron wires. The No. 6 have a RED LABEL while the No. 8 have a Green Label. The No. 8 contain twice the charge of explosive material as the No. 6. Although the No. 8 cost more, they are the most economical especially in tunnel and shaft work and where large charges of explosives are used.

Galvanometers

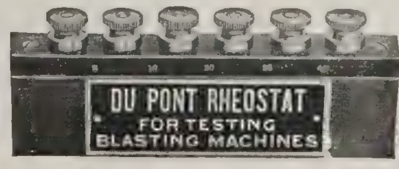
A Galvanometer is one of the most necessary accessories for blasting, as by their use it is possible to determine positively whether the electric circuit is complete or broken or whether it is short circuited.

It is also possible to determine the presence of any broken wires in the Electric Blasting Caps, even after they have been loaded. It is a positive necessity on work where much time is ordinarily lost looking for causes of misfire.

Rheostats

Are instruments used for testing Blasting Machines. By their use in connection with an Electric Blasting Cap it is possible to determine not only whether a Blasting Machine is up to its full strength, but also how many Electric Blasting Caps it can be depended upon to fire.

Galvanometer.



No. 6 Electric Blasting Cap.

THE BURTON POWDER COMPANY

General Office,
PITTSBURGH, PENNA.
Western Sales Office,
CHICAGO, ILL.

General Distributing Points:

PITTSBURGH, PA.
LOWELLVILLE, OHIO
CHICAGO, ILL.
SAGINAW, MICH.
NEW CASTLE, PA.
COLUMBUS, OHIO
JOLIET, ILL.
GRAND RAPIDS. MICH.
CUMBERLAND, MD.
FOSTORIA, OHIO
LADYSMITH, WISC.

Manufacturers of

Black Blasting Powder, Permissible Explosives Dynamite and Blasting Supplies

---

Black Blasting Powder

Burton Blasting Powder is made in several standard granulations. It is recommended for use in mines that are not gaseous or dusty. The grains are thoroughly glazed and are free running and in this way are protected from the moisture of the air.

Great care is exercised in separating the grains into the different sizes. Each granulation is uniform and the best raw materials are used. A miner will always obtain uniform results with his different shots if he uses Burton Blasting Powder.

Permissible Explosives

All of Burton's Permissible Explosives have passed United States Government Tests and are recommended for use in gaseous or dusty coal mines. They are manufactured so as to have different rates of detonation to meet the varying conditions of coal mining.

The following Permissible Explosives Manufactured by the Burton Powder Company are classified by the Bureau of Mines as explosives of class 1-A.

Fuel-ite No. 3. Mine-ite No. 5 D. Mine-ite No. 6 D.

They are especially recommended for mining lump coal. They are practically fumeless and produce small quantities of smoke on detonation.

The following permissible explosives are classified by the Bureau of Mines as explosives of Class 4. They are not affected by moisture and have the advantage of detonating easily:

Fuel-ite No. 1, Mine-ite A, Mine-ite A-2, Mine-ite B, Fuel-ite No. 2.

The permissible explosives Fuel-ite No. 1, Mine-ite A and Mine-ite A-2 have relatively high rates of detonation and are recommended for use in hard shooting Coal.

Mine-ite B and Fuel-ite No. 2 are permissible explosives which develop their gases at a slow rate and are specially adapted for use in soft friable coals or whenever lump or steam coal is desired.

Burton's representatives are mining experts. They have worked in the mine, and in addition to this they have made a close study of explosives, combined their knowledge of each and now are in a position to study mining questions from not only the viewpoint of the miner, but from the viewpoint of the manufacturer of explosives as well.

The services of these experts are at the command of our customers. When you are in doubt, communicate at once with our nearest office and it will take only a short time to settle any question which may bother you. If you have never used Permissible Explosives, investigate them thoroughly and see whether they will aid you. If you have used other permissibles than Burton's it will pay you to try Burton's Mine-ite or Fuel-ite. We have experts from the man who purchases the raw material to the man who sells it to you and if you give our representative a chance, he may be able to show you where you can increase the returns you are getting from permissibles.

Dynamite

Burton's GOOD LUCK DYNAMITE has been on the market for ten years, during which time it has established a wide reputation for uniformity and reliability. Millions of pounds are used annually. No more conclusive evidence of its superior quality could be given than the fact that the United States Government is one of its constant purchasers.

An entire department is devoted to its study. Naturally, we have found that results differ with the varying degrees of strength and speed. We have also found that different operations demand vastly different kinds of dynamite. Extensive experimental work has shown us the qualities which give best results in each of the different operations. The outcome has been a line of grades which perfectly meet each set of requirements.

When you use Burton GOOD LUCK DYNAMITE you get the benefit of all these years of experiment and study. Burton dynamite is the very tip-top of quality, but don't forget that it is not all a matter of quality. It is also a question of getting the right strength and speed for the work you want it to do.

GOOD LUCK DYNAMITE gives you just what you need in each case. The Horse Shoe Trade Mark and the Percentage of Strength are stamped upon every box and every cartridge. Insist on getting it, and accept no substitute. Then you will know you are **right.**

Blasting Supplies

Fuse, Blasting Caps, Blasting Machines, Electric Fuses, Wire, Thawing Kettles, Cap Crimpers, Augers, Galvanometers, Rheostats.

HERCULES POWDER CO.

Branch Offices.
Hazleton .... Pa.
Pittsburgh ...... Pa.
Chicago .... Ill.
St. Louis.........Mo.
New York......N. Y.

General Offices
Wilmington, Delaware

Branch Offices.
Joplin .... Mo.
Pittsburg ...... Kas.
Salt Lake City, Utah.
San Francisco....Cal.
Denver .... Colo.

WORKS
Black Powder.
Ferndale .... Pa.
Youngstown ... Ohio.
Columbus ..... Kans.
Pleasant Prairie, Wis.
Marlow .... Tenn.
Bacchus .... Utah
Hercules .... Cal.

HERCULES
POWDER

Black Powder.
Schaghticoke....N. Y.

Dynamite.
Kenvil..........N. J.
Joplin .... Mo.
Hercules .... Cal.
Bacchus .... Utah

Manufacturer of

High Explosives, Blasting and Sporting Powders.

Subsidiary, Hercules Powder Sales Co., Memphis, Tenn.

Products

Permissible Powders:—Red H, and Xpdite, Nitro Glycerin Dynamite, Ammonia Dynamite, Gelatin Dynamite, Blasting Gelatin, "E. L. F." (Extra Low Freezing) Dynamite, "B" Blasting Powder, "A" Blasting Powder, Hercules R. R. P., Blasting Supplies, Sporting Powders.

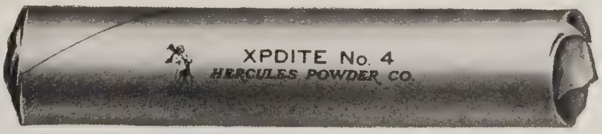
Hercules Permissible Explosives

The Hercules Powder Company manufactures three series of Permissible Explosives for use in gaseous and dusty coal mines, which have passed the rigid tests of the Government Testing Station at Pittsburgh, Pa.

Red H No. 1.	Xpdite No. 1.
Red H No. 2.	Xpdite No. 2.
Red H No. 3.	Xpdite No. 3.
Red H No. 4.	Xpdite No. 4.
Red H No. 5.	Xpdite No. 5.
Red H No. 6.	Xpdite No. 6.

Red H.

The Red H. Explosives are the product of a careful study of the requirements of an explosive for use in gaseous and dusty coal mines. Red H. is practically fumeless and with the exception of No. 3 requires no thawing. No. 1 is the quickest and has the greatest smashing effect. It can be used as Nos. 2, 4 and 6 are used, for shooting in hard anthracite or bituminous coal for coking purposes. Nos. 3 and 5 have a slow rate of detonation and, in coal produced, resemble a very good grade of blasting powder.

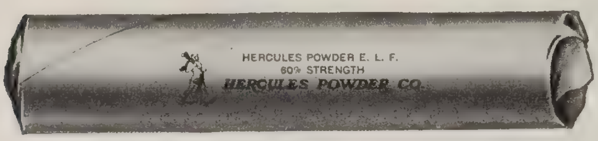


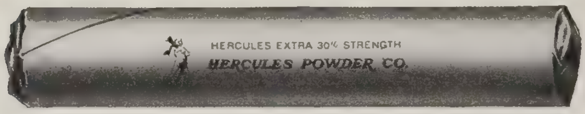
Xpdite

For wet coal mining where permissibles are required, the Xpdite explosives will give the most satisfactory results. Where a quick-smashing shot is necessary, use Xpdite No. 1. No. 2 has a slower rate of detonation than No. 1. No. 3 is a trifle slower than No. 2 and No. 4 is the slowest. Nos. 5 and 6 are made on a low frezing formula, but in every other way correspond to Nos. 2 and 3 respectively.

Hercules Nitro Glycerin Dynamite

Has a strong, quick-smashing action that makes it a good explosive to use in tight work and where finely broken material is desired. It has fairly good water-resisting qualities, but on account of its objectionable fumes should not be used for under-ground work except where ventilation is of the best. It is manufactured on both the regular and the extra low freezing formulae.





Hercules Extra (Ammonia) Dynamite

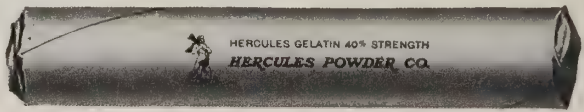
Hercules Extra Dynamite is superior to nitro glycerin dynamite for underground work because its fumes are less objectionable and because it cannot be ignited by the side spit from cheap, defective or injured fuse. It has more of a heaving and shattering effect, but in the higher grades will give good results in all but the very tightest work.

Hercules E. L. F., (Extra Low Freezing) Dynamite

The Hercules E. L. F. explosives are similar in properties and action to other brands of nitro glycerin and extra dynamites except that they do not freeze and become insensitive until after water freezes. Hercules E. L. F. Nitro Glycerin Dynamite should be used in all open work that is not very wet and where the material is hard. In underground work that is comparatively dry, Hercules E. L. F. Extra Dynamite will give the best results.

Hercules Gelatin Dynamite

For hard material and very wet work Hercules Gelatin Dynamite should be used. It is free from objectionable fumes and can be used safely in underground work. It also is manufactured on the E. L. F. formulae.



Hercules Blasting Gelatin

Is the strongest and quickest explosive in existence. It is absolutely waterproof and free from objectionable fumes. It can be used to good advantage in underground work by placing a few cartridges beneath charges of Hercules Gelatin in the bottom of holes that are difficult to blast.

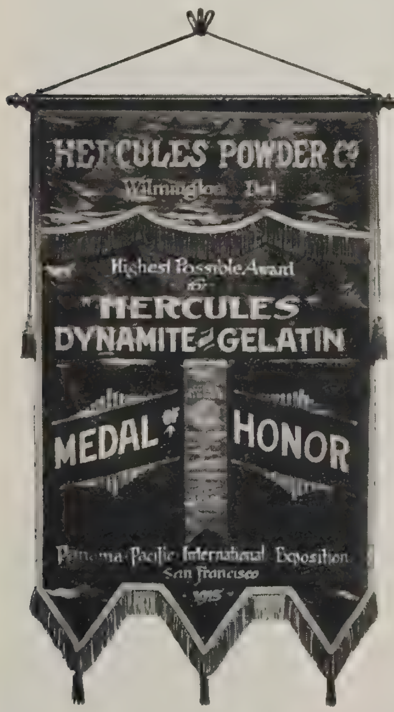
Hercules "B" Blasting Powder

The Hercules Powder Company manufactures a high grade of "B" Blasting Powder for use in non-gaseous coal mines, coal strippings, quarries and construction work. It is manufactured in all sizes of grains, glazed and unglazed, from FFFF to CCC, (running from fine to coarse.) Glazed powder is recommended in preference to unglazed as it absorbs less moisture, is easier to load, more compact and exerts a stronger explosive force.

Hercules Blasting Supplies

Include blasting machines, electric blasting caps, squibs, caps, fuse, leading and connecting wire, magazines; in fact everything used with explosives.

Awarded the Medal Of Honor



The Jury of Awards at the Panama-Pacific International Exposition recognized the merits of Hercules Products and awarded the Medal of Honor for Dynamite and Gelatin to the Hercules Powder Co. This is the highest possible award it could give for these explosives and confirms the opinions of thousands who use them.

When thinking of using Hercules Dynamite or Gelatin you can feel assured that you will be using a highly efficient explosive. The decision of the impartial experts who composed the Jury of Awards gives these Hercules explosives a recommendation which should satisfy the most exacting user.

Hercules Service

With a line of plants stretching from the Atlantic to the Pacific and a large number of magazine distributing points, all conveniently located, the Hercules Powder Company is able to take care of its customers' needs promptly and efficiently. All the ingredients which go into the manufacture of our products are carefully selected and are the best obtainable. In charge of our plants are men whose knowledge and experience in the manufacture of explosives is a guarantee that these ingredients are combined with the highest possible degree of skill and care. However, Hercules Service does not stop with the prompt delivery of high grade explosives. Our technical representatives are at the service of our customers either to advise as to the best explosives for any particular work or to assist in getting the maximum efficiency from Hercules Explosives that are in use. We are not satisfied simply to sell the best dynamite, blasting powder and blasting supplies, but when a customer wishes it we are glad to show how they can be used most economically. Those why buy Hercules products have an efficient corps of Explosives Engineers at their disposal.

It will cost you nothing to investigate Hercules Explosives and Hercules Service. It may be the means of effecting a substantial saving for you by increasing the amount of work you get out of your explosives. Will you not communicate with our nearest branch office so that our representative may call and tell you more about Hercules?

THE KING POWDER COMPANY

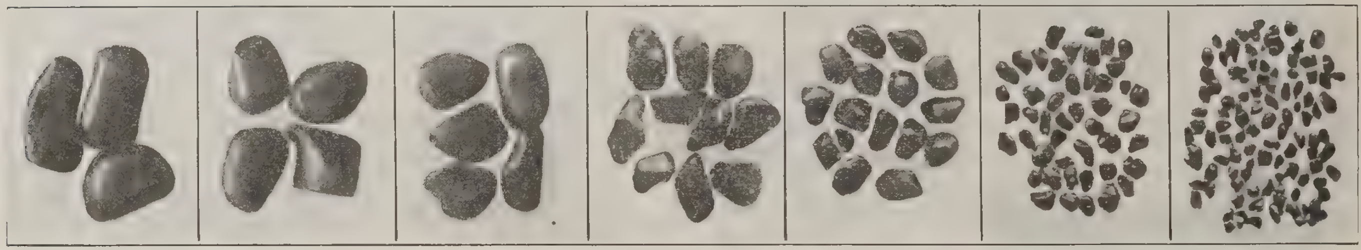
CINCINNATI, OHIIO
First National Bank Buiding

KING POWDERS
TRADE MARK

Works, King's Mills, Ohio
Middletown Junction, Ohio

King Powder

The Powder that will give Results
in increased tonnage and in percentage of lump



King Blasting Powder is made in seven standard granulations, from the best grade of materials; it is thoroughly incorporated, hard pressed, high glaze and of uniform quality and size; in fact, it is a superior article for securing the greatest possible results, not only in tonnage, but in the high percentage of lump produced. It will meet every demand in the blasting line for which black powder is suitable.

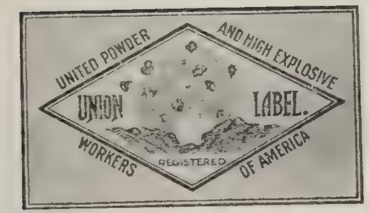
Write Us for Suggestions
The services of our experts are
at your command

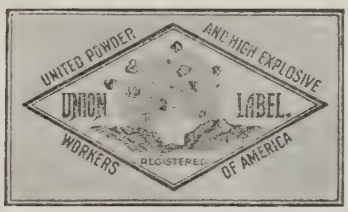
UNITED STATES POWDER CO.

Home Office: Terre Haute Trust Building, Terre Haute, Ind.
Factory at Coalmont, Ind.

MANUFACTURER OF

UNION MADE BLACK BLASTING POWDER

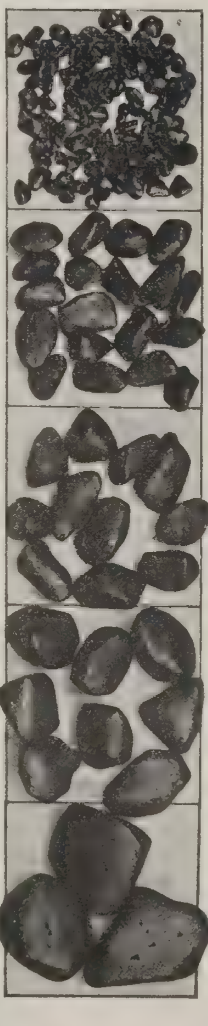




The manufacturers of the United States black blasting powder claim several points of superiority for this brand. That is what every manufacturer does for his particular brand as a rule. Under the circumstances it is rather surprising to know how seldom the purchaser or consumer of black blasting powder makes careful examination or tests with a view of proving or disproving the manufacturer's claims.

In the manufacture of U. S. black blasting powder, the greatest possible care is taken to purchase only the best grades of raw material; to thoroughly incorporate the ingredients during the mixing process; to press these into an extremely hard cake; to glaze each grain with a bright, moisture-resisting layer of plumbago; and to finally screen the powder in a careful and systematic manner which insures a grain of uniform size.

The U. S. Powder Co., has spent a great deal of time and money in standardizing the size of its grain. Taking the Illinois mining laws as an operating standard, this company has for some years turned out the different sizes of black powder with almost the same uniformity as if the grains had been moulded in the same mould. By examining the picture printed down the centre of our page you will be struck immediately by the remarkable uniformity in the grains of powder in each size. This picture is a faithful photographic reproduction of U. S. black powder, actual size, and shows the five standard sizes which are most popular among coal miners.



ILLUSTRATIONS ARE ACTUAL SIZE OF GRAINS

Not only has the U. S. Powder Co. taken the greatest pains to use the screens which will produce the regular sized grains, but its chemists have periodically made analyses of the different grains of powder in order to check up the factory work and make sure that each grain was of uniform composition with each other grain. Not only has the composition and size of grain received attention but apparatus has been devised and built for the purpose of determining the specific gravity or weight of the powder; in other words steps have been taken to make the U. S. Brand an absolutely standard article.

The fact that the U. S. Powder Co. has employed only skilled and experienced Union Labor at its plant since it started in business has contributed not a little to the successful operation of the manufacturing processes in every department, resulting in the recognized superiority of this product.

MINERS' SUPPLY CO.

SQUIBS

St. Clair, - Pa.

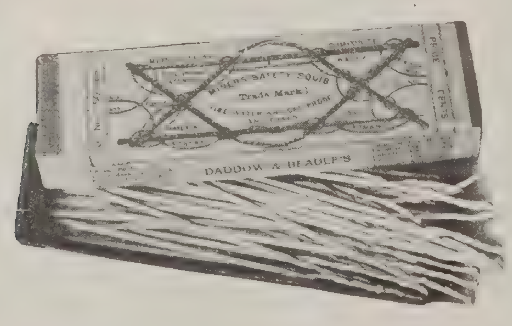
The Daddow & Beadle Patent Safety Squibs

for exploding black powder were originated and perfected by S. H. Daddow and Jesse Beadle. We have manufactured them for forty years, and they are established wherever mining is done as the safest, cheapest and most reliable means for exploding blasts in mines and quarries.

These squibs are packed in neat strong wooden cases, weighing about thirty pounds, easily stored and handled. They may be kept for years in a dry place without damage. A case holds 100 boxes, each containing 100 squibs—10,000 squibs to a case.

We call attention to this especially because since we originated and established this business other squibs have been offered on the market which in many cases are short count, varying from 100 to 80, or even less, to a box. Among these short-count squibs there are usually some that are unusable, without powder or with defective matches.

The D. & B. Squibs are honestly counted and rigidly inspected. Every squib we send out is reliable and effective, so far as care and attention can make it so.



No. 1 Squib

is for general use in mines where there is no dangerous quantity of inflammable gas. The match burns with a flame. These squibs are packed in boxes with yellow labels, and are known in the mines as "yellow label" or "sulphur" squibs.

No. 2 Squib

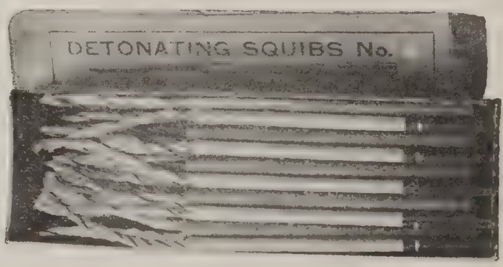
is similar to No. 1 described above, but is made specially for the deep pitching veins of the anthracite coal fields.

No. 3 Squibs

are intended for use in "fiery" or gaseous mines. The match burns with an ember which will not ignite gas. Touch paper is furnished for lighting the match. Boxes have red labels and the squibs are called by the names "gas" or "touch squibs".

Squibs for Exploding Dynamite and Permissible Powder

Nos. 1, 2 and 3 are for use with black powder. For use in exploding dynamite and "permissible powder" we offer our No. 6 Detonating Squib, made under patents of the Atlas Powder Company. This squib is complete in itself, ready to place in the needle hole as it comes from the box, and takes the place of blasting cap and fuse or electricity. It is simple, reliable, effective and is the cheapest method of firing charges requiring a detonator. These squibs are packed in cases weighing forty pounds. A case contains forty boxes of twenty-five squibs each—1,000 squibs to the case.



Nos. 1, 2, and 3 squibs are carried by all railroads as freight or express without restrictions.

Detonating Squibs are subject to same railroad regulations as blasting caps, but we can usually ship within two or three days from receipt of order.

CORDLEY AND HAYES

"Fibrotta" 7 and 9 Leonard Street "Fibrotta"
NEW YORK CITY, N. Y.

The "C & H" Safety First Powder Flask For Mines

Made of Indurated (hardened) Fibre, a positive non-conductor of electricity. Can be carried with perfect safety through electrically equipped and operated mines.

The flask is capable of holding 5 pounds of powder, (the maximum amount allowed by law) and no more.

The Flask is safely closed with a non-conducting cork to which a stout cord is attached.

It is light—is easy to carry, water proof—keeps the powder **safe** and **dry**, has no metal to rust or become battered, and with ordinary care will outlast a dozen of the common tin can type of powder jacks.

Moist powder won't do the work that dry powder does. Metal jacks are **never** water-tight. Even if your leaky tin jack spoils only a can of powder in a year, you are wasting more than the cost of a "C & H" Fibre Jack. That means you can pay for a "C & H" Flask with what it saves you because it

KEEPS YOUR POWDER DRY

"C & H" Electrical Pails

These pails are made of the same material—Indurated Fibre. This signifies a pail that is absolutely water and rust proof!

The pails are made in one piece without seams, they cannot shrink or swell nor can the bottom drop out. They are a non-conductor of electricity. The ears are inside of the pail and the bails fall inside. A very safe pail to use around a live third rail and live wires.

Fire Pails

Fibrotta Fire Pails can be had in three types and four sizes, quality the same in each.

"Labeled" Fire Pails, approved by National Board of Fire Underwriters. "Standard" Fire Pails same as above but without label. Fibre Fire Pails same as above but without label and with cheaper fittings.

"XXth. Century" Coolers

Style No. 560 shown. This will take a 5-gallon bottle and has an ice capacity of 15 to 20 lbs. Sanitary to the highest degree—keeps water and ice separated.

Economical in ice consumption.

Durable.

WRITE FOR OUR COMPLETE CATALOGUES

KEYSTONE
THE
MINING
CATALOG
COMBINED WITH
COAL FIELD
DIRECTORY
CONSOLIDATED PUBLISHING
COMPANY INC.

MINE LIGHTING SECTION

The following manufacturers have catalogue descriptions in this section:

Concordia Safety Lamp Co.
Edison Storage Battery Co.
Grier Bros. Co.
Indestructo Electric Mine & Lamp Co., Inc.
Justrite Mfg. Co.
Koehler Mfg. Co.
Macbeth-Evans Glass Co.
Mannesmann Light Co. of America, Inc.
Simmons, John, Co.
Union Carbide Sales Co.
Witherbee Igniter Co.
Wolf Safety Lamp Co. of America, Inc.

For additional descriptions of Mine Lighting Equipment, not appearing in this section, refer to Index of Products in front of book.

CONCORDIA SAFETY LAMP CO., Inc.

FULTON BUILDING; PITTSBURGH, PA.

Manufacturers of

ELECTRIC SAFETY LAMPS FOR MINES

of which more than 150,000 are in daily use

Products:
"CEAG" Electric Cap Lamps, "CEAG" Electric Hand Lamps, "CEAG" Electric Trip Lamps, Rescue Stations, Charging Equipment, Lamp Racks, Magnets, Complete Lamp Cabins.

Awards:

"CEAG" Cap Lamps, **Approval No. 15,** U. S. Bureau of Mines, under Schedule 6 A.

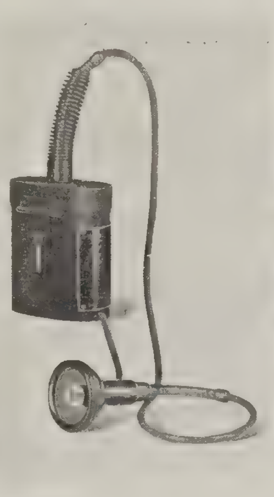
"CEAG" Hand Lamps, **Approval No. 12,** U. S. Bureau of Mines, under Schedule 6 A.

First Prize, British Home Office Competition, 1912, out of 197 lamps.

First Prize & Gold Medal, World Exhibition, Ghent, 1913.

Gold Medal, Electric Mine Lamp, Lamp House and Accessories, Panama-Pacific, Int. Exposition, San Francisco, 1915.

Collaborator's **Silver Medal,** in cooperation with the U. S. Bureau of Mines in "The Mine," Panama-Pacific Int. Exposition, San Francisco, 1915.



Type R M 5

PERMISSIBLE
PORTABLE
ELECTRIC MINE LAMP
DEPARTMENT OF THE INTERIOR
SAFETY
EFFICIENCY
MINERAL INDUSTRIES
BUREAU OF MINES
APPROVAL No. 15
Issued for safety and for practicability and efficiency in general service to the
CONCORDIA SAFETY LAMP CO.

U. S. Bureau of Mines, Approval No. 15. Under Schedule 6 A.

Safety:
No ignition of inflammable gas is possible either inside or outside of the lamp. No liquid can be spilled and gas generated by the accumulator is allowed to escape easily. Lamps can be opened only by electro magnet in lamp house and therefore no tampering with lamps or short circuiting is possible. Lamps will not burn unless assembled right—therefore, absolutely FOOL-PROOF.

Charging Arrangements:
With our charging arrangement from 1-80 batteries (Electric storage battery, lead acc. type) can be charged at one time on 110 or 250 D. C.

Type Rs.

PERMISSIBLE
PORTABLE
ELECTRIC MINE LAMP
DEPARTMENT OF THE INTERIOR
MINERAL INDUSTRIES
BUREAU OF MINES
APPROVAL No. 12
Issued for safety and for practicability and efficiency in general service to the
CONCORDIA SAFETY LAMP CO.

U. S. Bureau of Mines, Approval No. 12, Under Schedule 6 A.

Type R

Durability:

Lamps built to stand rough usage, materials used not liable to deterioration by corrosion. Only best material used, and all parts easily exchanged, assembled and cleaned.

Light and Maintenance:

Strong and well distributed light for fourteen burning hours on one charge. Creates better working conditions. Increased output. We guarantee maintenance cost. Consult us for expert advise on anything pertaining to electric safety lamps.

WRITE FOR FULL PARTICULARS AND CATALOGS

Edison Storage Battery Company

Factory and Main Office

232 LAKESIDE AVENUE, ORANGE, N. J.

Manufacturers of the

Edison Electric Safety Mine Lamp

of which over 50,000 are in daily use in the United States.

Distributors in
NEW YORK, BOSTON, CHICAGO, DETROIT, SAN FRANCISCO,
LOS ANGELES, SEATTLE, NEW ORLEANS

General Distributors
Mine Safety Appliances Co., Pittsburgh, Pa.

In February, 1915, the Bureau of Mines of the Department of the Interior approved the Edison Electric Safety Mine Lamp for safety, practicability and efficiency in general service, under the provisions of Schedule 6A. While this approval is marked No. 10 the Edison lamp is the first to be so approved.

With the exception of the head-piece and cable, the Edison Mine Lamp is constructed throughout of nickel-plated steel, light in weight, and is extremely rugged and durable. These lamps make use of the well known Alkaline Storage Battery, which as the name suggests, is radically different from any other storage battery. The construction of the Edison Mine Lamp Storage Battery is similar to that of the Edison Storage Batteries used in mine locomotives, electric vehicles, for railway train lighting, signaling, and many other services.

PERMISSIBLE
PORTABLE
ELECTRIC MINE LAMP
APPROVAL No.10
Issued for safety and for practicability
and efficiency in general service
to the
EDISON STORAGE BATTERY CO.

The tubes and pockets that hold the active materials, the plate grids, container, case, etc., all are made of high-grade, nickel-plated steel. The positive active material is nickel hydrate held in perforated steel tubes; iron oxide, held in perforated steel pockets, forms the negative.

The solution in which these active materials are submerged is alkaline (non-acid), and in the operations and reactions of charging and discharging there is no appreciable mechanical, electrical or chemical deteriorations, consumption or corrosion.

Two cells, each in a steel container and with top welded on, fit snugly in a light case of steel, primarily designed as a box in which to carry the battery. The battery cells themselves are constructed in such a manner that none of the alkaline electrolyte will spill, regardless of the position in which the cells are placed.

A cover with a separable hinge permitting its removal when open, facilitates charging the batteries in banks.

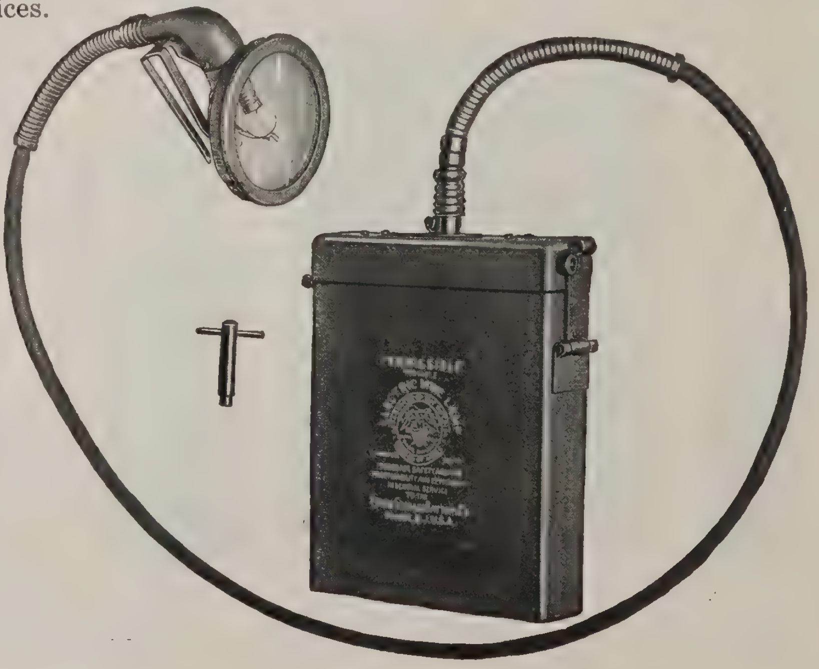
A twin-conductor, rubber covered and thoroughly armored cable connects the battery to the cap lamp. This lamp consists of a nickel-plated brass reflector provided with hook to fit into the regulation miner's cap. A Tungsten Lamp is forced against a spring by means of a clip at its tip, in such a way that if the lamp be broken the base is instantly disconnected and the lamp extinguished,—thus preventing any dangerous flame or open light from forming to ignite gas or dust. This safety feature has been thoroughly tested by the Bureau of Mines and unqualifiedly approved. The reflector gives an angle of illumination considerably greater than the 130 degrees required by the Government.

In making the selection of proper mine lamp equipment to operate over the longest period at the least maintenance cost, the Edison Battery offers the following exclusive advantages: No expert attention is required to keep the battery in proper operating condition, and, as the electrolyte is non-acid, no specific gravity readings are necessary. There are no corrosive fumes, consequently no special charging room is necessary, regardless of the number of batteries to be charged.

The Edison Battery is not injured by overcharging for short or prolonged periods, by standing idle indefinitely in any state of charge or discharge, and there is no self-destroying action to take place in this battery. Charging in the reverse direction will not injure the Edison Battery in any way.

There is no sediment to be dug out; no renewing of plates or separators, no buckling or growing of plates. Nothing but a practical steel tank for the storage of electrical energy for use when and how the operator sees fit,—having an extremely long life, with minimum depreciation and maintenance costs.

This company also manufactures a special trip lamp, constructed along the same general lines as the regular mine lamp equipment; using the same battery and container, but with a red lens in the head-piece. This head-piece is firmly secured to the side of the container, and a short connector between the lamp and battery case is used in place of the long cord and regulation head-piece of the standard cap lamp.



INDESTRUCTO ELECTRIC MINE LAMP CO., INC.

1215-17 So. 15th Street
PHILADELPHIA, PA.

Manufacturers of

Indestructo Electric Safety Miners Lamp

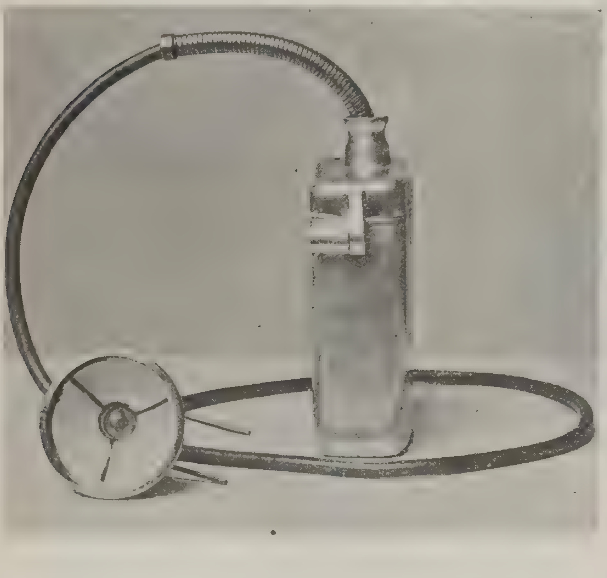
Products

Electric Safety Cap Lamps for Miners.

The Indestruct Electric Safety Lamp has been designed and built to meet the needs of all that require a lamp combining these features: Safety, Intense Light, Strength and Durability.

Our claims cover the following point:

1. Indestructo is as strong as its name implies.



2. The Indestructo battery will **not leak** or spill acid even though inverted for a full shift. Owing to our patented vent tube feature, we at all times have a perfect vent for the acid fumes and still trap the acid. This is a distinct feature over all other makes on the market.

3. The **Case and Battery** are made along curved lines and are therefore greatly strengthened. This conforms to the shape of a man's body and insures greater comfort in wearing same.

4. Our **Magnetic Lock** is one in fact as well as name, requiring from 30 to 50 volts to throw the plunger to open same.

5. The **Armored Cable Support** at the battery case end is made with a swivel which will prevent to a great degree the wearing out of the cord thereby short circuiting your battery.

6. The Indestructo **Safety Circuit Breaker** extinguishes light when glass front is broken, it does not depend on shattering of bulb, it operates surely and safely and cannot become jammed. Safety always.

7. We guarantee the battery to give an intense light (free from all high lights and other defects) for 12 hours, provided batteries are charged as directed.

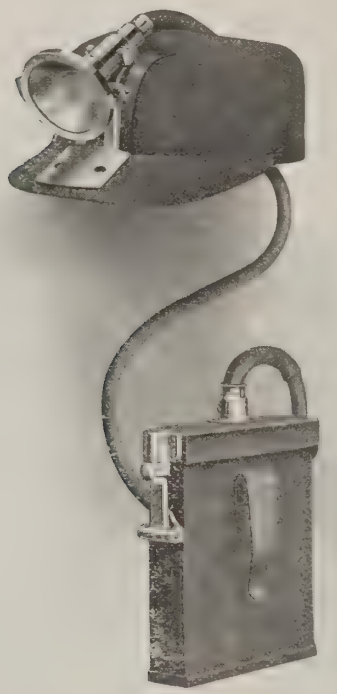
8. Simplicity, durability, strong light, low upkeep cost and the non-leakable feature make the Indestructo lamp the ideal one for both the operator and miner.

Mannesmann Light Company of America, Inc.

TOMPKINSVILLE, N. Y.

Manlite

Electric Safety Lamps



OFFICIALLY APPROVED

Products

Highest grade Electric Safety Lamps of all kinds and for all purposes.

Safety

Guaranteed by the approval of the U. S. Bureau of Mines.

Efficiency

Full brilliant light guaranteed for 16 consecutive hours per charge of Manlite Battery; Manlite Cap Lamp has 3.65 Candle Power. Average life of Manlite Bulbs exceeding 800 hours in practical service. Perfectly shadowless light. Manlite Lamps burn with battery placed in any position. Upkeep of Manlite Lamps less than ONE CENT per shift. Lightest weight combined with best material, greatest economy and highest efficiency. Headpiece of cap lamp weighs only 4 ounces. Most perfect charging equipments, specially constructed for the safety lamp service and based on practical experience.

Prices

Notwithstanding the many particular vantage points, Manlite products are sold at most reasonable prices, which also refers to the spare parts. Manlite products are sold under binding guarantees, and Manlite Lamps are rented to mines for a certain period of time before they are sold. Proposals and advice given free of charge by a staff of experts. Literature and references gladly given.

WITHERBEE IGNITER COMPANY

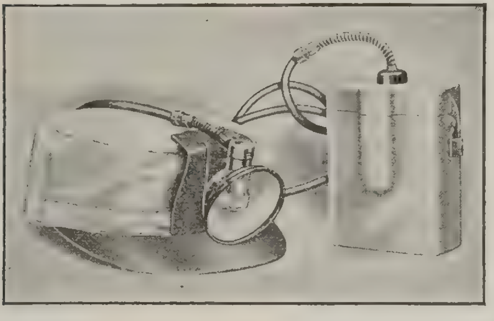
Manufacturers of

WICO SAFETY ELECTRIC MINE LAMPS

Main Office and Factory, Springfield, Mass.,

Eastern Representatives
RIVENBERG-BLACKWOOD CO.
Coal Exchange Bldg., Scranton, Pa.
5085 Jenkins Arcade, Pittsburgh.

Western Representatives
THE WESTERN SALES AND SUPPLY COMPANY,
Gas and Electric Bldg., Denver, Col.



Safety and Economy First

The lamp which provides a satisfactory, safe light at the lowest possible cost, considering first investment plus up-keep, is the one **you** will eventually purchase, and that is why we believe you will eventually install WICO lamps.

It is impossible to over-emphasize the importance of our having thousands of lamps in **successful** service and remember we began to sell them in quantity before most of the other makes now on the market were heard of. Our statements are based on this experience and it is unnecessary for us to point out the advantage in comparison with claims based on the results of a few experimental samples.

It has been shown during the last five years that a properly made lead battery when charged by a person with the knowledge of the simple requirements, will produce current at a less cost than any other battery. You will find that you do not need to pay a premium for insuring your battery lamps against destruction in the charging room, because the employees who are competent to look after your safety lamp equipment can and will learn the business of caring for lead batteries without the slightest difficulty.

As it seems certain that you will soon want to equip your mines with electric lamps, we will appreciate it if you will drop a line to our nearest office and have our representative send you our literature or call on you if you desire. Permit us to assure you that we have a **business** proposition, we appreciate the necessity for economy as well as safety and we want to help you to kill the two birds with one stone.

APPROVAL NO. 14, U. S. BUREAU OF MINES SCHEDULE SIX-A

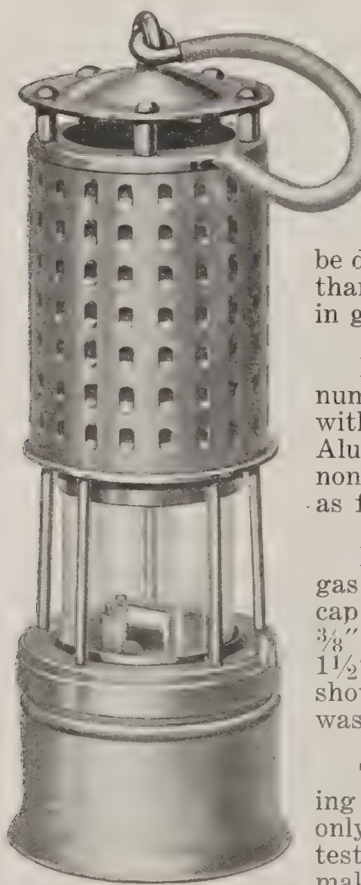
KOEHLER MANUFACTURING CO.

MARLBORO, MASS.

Manufacturers of

KOEHLER SAFETY LAMP

The Koehler Mine Safety Lamp is a double gauze bonnetted lamp, of the Naphtha burning type taking air from below the flame. The ventilation is so controlled that the lamp does not heat up therefore it requires less adjustment of the flame resulting in less smoking of the globe and gauzes. It also gives a higher and more uniform illumination.



Model No. 1 with Magnetic Lock for Horse Shoe or Electric Magnetic.

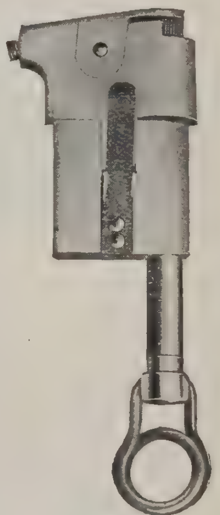
As a result of the greater flame intensity and steadiness it is certain and more sensitive in its indications of gas, so that a smaller per centage of gas can be detected with this lamp than with any other lamp in general use.

Results of a great number of tests made with the Koehler flat wick Aluminum lamp using a non-luminous flame were as follows:

Indication of ½% of gas; at ¾ of 1% a 3-16″ cap was shown; at 1% a ⅜″ cap was shown; at 1½″% a ⅝″ cap was shown; at 2% 1⅛″ cap was obtained.

The higher illuminating power of this lamp not only makes it a better testing lamp, but also makes it the very best type of lamp for working and travelling purposes.

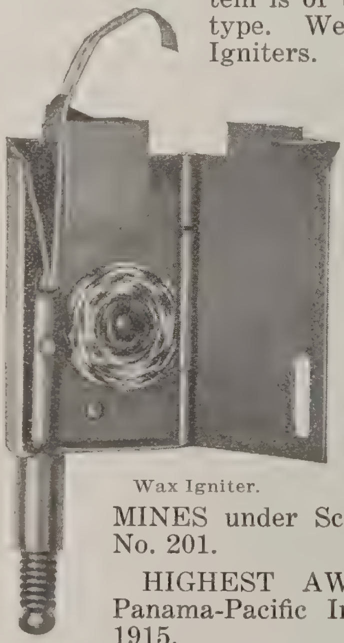
Safety should be the important consideration in the construction of a Safety Lamp. As the globe is recognized as the weakest part of a lamp, the breakage of the globe should be most effectively guarded against, especially from excessive heating, as when the lamp is placed in gas. This is taken care of in the Koehler lamp by means of a very efficient and durable steel expansion spring which always gives a tight joint, the pressure on globe is constant, and at the same time the expansion due to the most intense heating caused by flaming gas inside the lamp is properly taken care of as it is impossible to screw the lamp fount beyond a certain point and therefore the full expansive power of the expansion spring is available.



Pyro Igniter.

The Koehler Lamp when placed in the most explosive mixture of gas and air, withstood 50 tests at a velocity of 2500 feet per minute without causing a single cracked or broken globe and stands alone in its class from the point of safety, efficiency, and economy in operation. It stands first on the list of lamps tested by the U. S. Bureau of Mines for the reason that it passed with a perfect rating as not one failure of any kind resulted in these tests.

Koehler Safety Lamps are equipped with either Magnetic Locks (single or double), or Key Locks. These locks cannot be tampered with. The Ignition system is of the latest and very best type. We furnish Pyro or Wax Igniters.



Wax Igniter.

All parts are made in our own factory here in Marlboro, Mass. Nothing is imported. This means standardization; all lamps and models interchangeable—a fact which should appeal alike to lamp bosses and mine owners.

First Flame Safety Lamp APPROVED by the U. S. BUREAU OF MINES under Schedule No. 6, Approval No. 201.

HIGHEST AWARD GOLD MEDAL Panama-Pacific International Exposition, 1915.

We Manufacture Safety Lamp Appliances of Every Description. Send for Catalog.

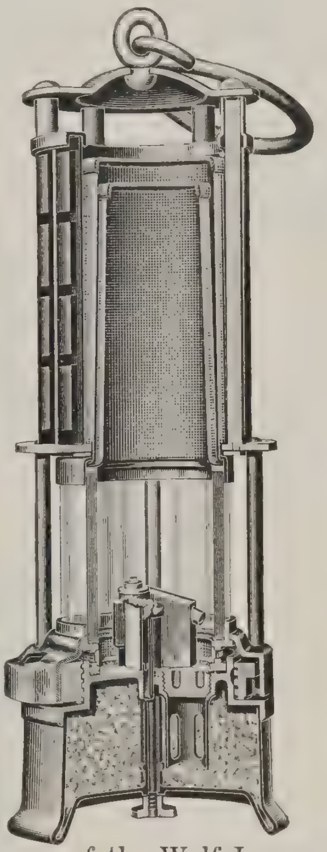
Wolf Safety Lamp Company of America, Inc.

74-80 Washington Street, New York City, N. Y

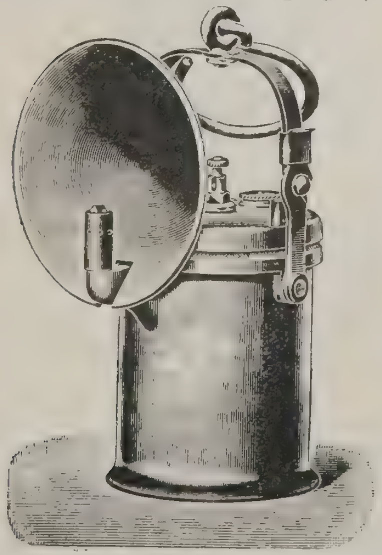
Special Selling Agents

Draeger Oxygen Apparatus Co Pittsburgh, Penna

Wolf Miners' Safety Lamps



The first Safety Lamp that was made for burning naphtha was the Wolf Lamp. It also was the first lamp equipped with magnetic lock and internal igniter. Since 1883, when the Wolf Lamp was brought on the market, many improvements have been made. As it always has been of excellent workmanship, it was and is the leading miners' lamp. We make the lamps with round and flat burner. Corrugated shields or bonnets will protect the lamps against strong air currents. The paraffin or metal spark igniter with which the lamp is equipped enables the miner to relight same when it extinguishes. We have lamps for all purposes. If you want a reliable lamp for surveying work or for testing gas the Wolf will give the most satisfactory service. The main advantages of the Wolf Lamps are safety, cleanliness, steady light, great sensitiveness in detecting gas, durability, and low cost of maintenance.



If an especially high lighting power is requested our **Acetylene Safety Lamp** will be the most suitable for this purpose. These lamps are equipped with an internal paper friction igniter and are absolutely safe.

What the mine operators and the miners think of the Wolf Lamp is best shown by the report of the Department of Mines of Pennsylvania, which states that "34,109 out of 43,355 Safety Lamps in use in the Bituminous District of that State are Wolf Safety Lamps, and the residue (9,246) are of six different makes." Do not these figures speak a powerful language in behalf of the Wolf Lamps?

Wolf Acetylene Lamps

We make various types of Acetylene Hand and Cap Lamps. The most used Hand Lamp is the type shown in this illustration. Also our Carbide Lamps distinguish themselves by an unexcelled quality and workmanship. It is beyond question that the better the light the more efficient the work of the miner will be.

Big operations like the Ray Consolidated Copper Co., Phelps-Dodge interests, Miami Copper Co., Inspiration Copper Co. know those facts, and they, therefore, are using our Wolf Acetylene Hand Lamp. The lamps are simply constructed and of great durability. The flame is hardly affected even by strong air currents. We only would like to mention that over a million of these lamps are in use.

Wolf Electric Safety Lamps

This type for miners is our latest specialty, on the development of which our experts have devoted many years. Electric Lamps are furnished for hand or cap in several different designs. Both Electric hand and Cap Lamps are equipped with key or magnetic lock. The latter absolutely preventing unlawful opening by the miner.

We are equipped to furnish all accessories for lamps and can give complete expert information on your particular lamp problem, if requested.

Separate catalogue of each style of lamp.

All our lamps are now manufactured in this country and we have not been afraid of any costs and experiments in order to furnish them of the same high quality that distinguished the German lamps.

THE WOLF—THE MINE LAMP THEY TRY TO IMITATE.

MACBETH-EVANS GLASS COMPANY

Pittsburgh, Pa.

Branch Offices

New York............143 Madison Avenue
Chicago.............172 West Lake Street
Philadelphia.........1613 Chestnut Street
Boston....................30 Oliver Street
St. Louis.........Laclede Gas Light Bldg.
San Francisco................Rialto Bldg.
Cincinnati................Pickering Bldg.
Cleveland...............1900 Euclid Bldg.
Dallas...............1812 Live Oak Street
Macbeth-Evans Glass Company, Ltd..................160 Bay Street, Toronto, Canada

Macbeth "High Speed" Glasses for Miners Safety Lamps

These glasses are the most heat-resisting ever made. They stand the tests of the U. S. Bureau of Mines and the British Home Office and have been subjected to tests even more severe.

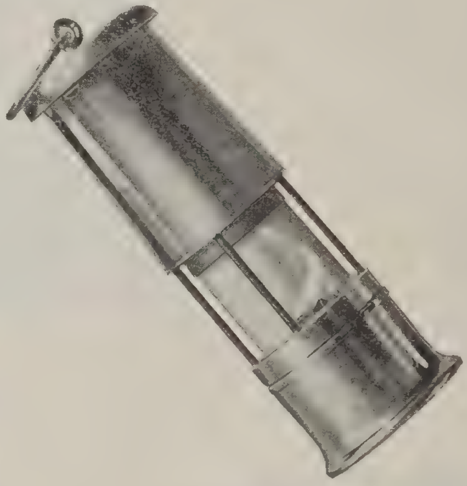
They may be put into boiling water, left there to become thoroughly heated to 212°, then immediately plunged into ice water. For flame test, a flame can be directed indefinitely against the sides of the glass without breaking.

These tests are very simple and can easily be made.

Macbeth "High-Speed" glasses have been adopted as standard by many well-known companies.

Coal mining companies report that breakage has been cut down more than fifty per cent. Any breakage which has occurred has been entirely due to such accidents as striking the glass (not the lamp) against sharp edges of rock, or being struck by miners' implements.

In the very rare cases of this glass breaking the broken piece does not fall out, but stays in place — thus retaining the safety feature of the lamp.



Flame Test

Flame can play indefinitely against sides of glass without breaking it.

Macbeth "High-Speed" glasses are made for all standard makes of safety lamps.

Colored glasses (red, green, yellow or blue, or Alba, white, a diffusing glass) are also made.

"High-Speed" is a very economical form of insurance, reducing accidents, with all their frightful results and heavy costs, to the minimum.

It is also the cheapest way to buy glasses—not per piece, but by the year. The breakage is so small.

Write for further information and prices.

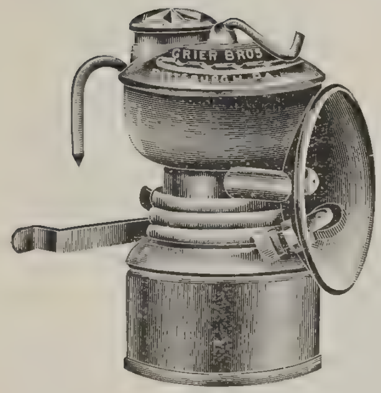
THE GRIER BROTHERS COMPANY

ESTABLISHED 1839.

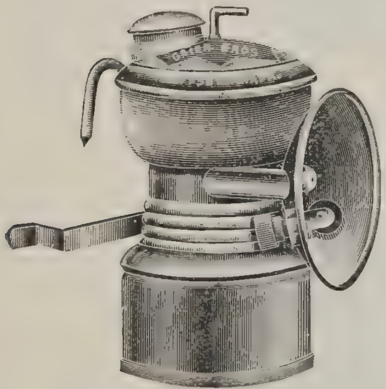
PITTSBURGH, PA.

Manufacturers of

Carbide Lamps, Tinware and Miner's Supplies



No. 95, Polished Brass.
No. 105, Polished Nickel.
Dia. of Reflector, 2¼ Inches.



No. 92, Polished Brass.
No. 102, Polished Nickel.
Without Valve Feed.
Dia. of Reflector, 2¼ Inches.

After several years experimental work, we announce that we now have the **best line of Miners' Carbide Lamps Manufactured.**

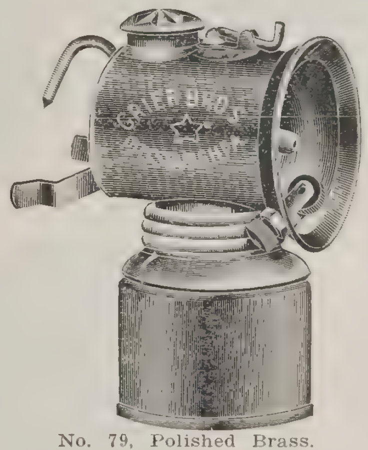
We exercise the greatest care, both in **workmanship** and **material.** Every lamp is thoroughly tested before leaving our factory. If one proves defective we willingly replace it.

The valve lamp has proven the most popular among the miners. Our valve puts the water just where it is needed.

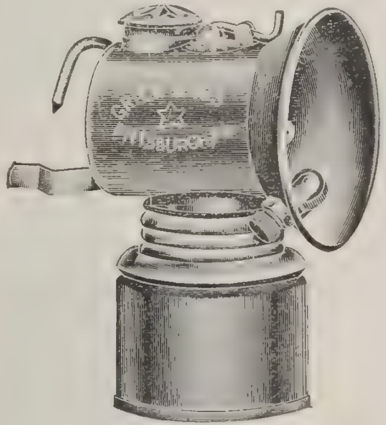
There are no parts to wear out.

Water can not leak from the filler cap as in the old lamps.

Note the reinforcement in tops of Numbers 95 and 92, also reinforced reflectors on all lamps. Reflectors can not be knocked off.



No. 79, Polished Brass.
No. 69, Polished Nickel.
Dia. of Reflector, 2¼ Inches.



No. 77, Polished Brass.
No. 68, Polished Nickel.
Dia. of Reflector, 2½ Inches.

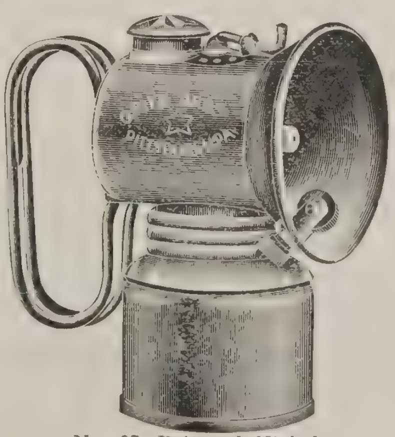
Why Grier Lamps Are Superior

No parts to wear out.

No overflow from filler caps.

No valve trouble.

No trouble in removing carbide chambers from lamps. We put three finger grips on each chamber, this gives the miner a chance to unscrew the chamber no matter how tight it becomes.



No. 67, Polished Nickel.

Every place the Grier lamps have been tried they have given perfect satisfaction. A trial is all we ask to convince you.

We were the first to put the lighter on carbide lamps.

Write for catalog.

JUSTRITE MANUFACTURING CO.

CHICAGO, ILL.
Manufacturers of

Justrite Carbide Mine Lamps

for
Miners, Superintendents, Engineers, Drivers, Pit-Bosses, Etc.

Justrite
TRADE MARK

Products

Justrite Carbide Lamps are made in many sizes and different styles. There is a suitable lamp for every mining purpose. The models illustrated below are the most desirable for coal miners and are known as Cap or Pit Lamps. All lamps are equipped with Self-Lighter attachment.

The Lever Water Feed

consists of a valve enclosed in a ¼-inch tube, so constructed that it increases or decreases the supply of water, enabling the user to burn the flame at any size desired. The valve is operated by a lever sliding back and forth over notches, and held firmly in place by a small spring.

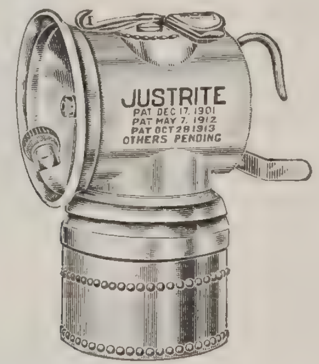
The Spiral Water Feed

The new Spiral Valve Stem prevents clogging in the water tube. It fits snugly and forces the water to travel around the Spiral a distance of 7 inches while in other lamps it travels in a straight course only 1¼ inches. This increases the gas resistance about six times, which prevents waste of gas and produces an even, steady burning flame.

To Clean Valve Stem

Open lever as far as it will go, lift out the valve stem slowly, clean and replace slowly. This can be done in a few seconds without putting out the light.

Note—Write for catalog showing our complete line of Lamps, Lanterns—Repair Parts and Useful Accessories.



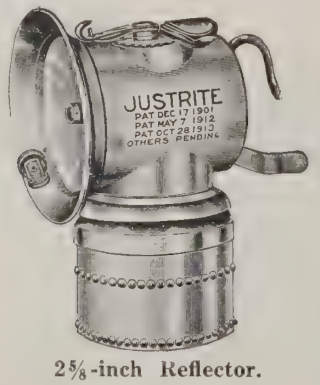
Weight
5
Ounces

Candle
16.7
Power

2¼-inch Reflector.

No. 85	Polished Brass	with	No. 77	Carbide Can
No. 89	Gun Metal Finish	"	No. 77	" "
No. 86	Nickel Plated	"	No. 77	" "
No. 57	Polished Brass	"	No. 68	Extra Bottom
No. 59	Gun Metal Finish	"	No. 39	" "
No. 58	Nickel Plated	"	No. 31	" "
No. 407	Polished Brass	Lamp Only		
No. 408	Gun Metal Finish	" "		
No. 409	Nickel Plated	" "		

Equipped with No. 66 Air-Hole Lava Tips.



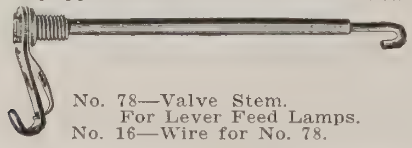
Weight
5
Ounces

Candle
18
Power

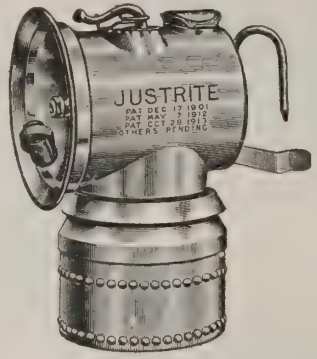
2⅝-inch Reflector.

No. 258	Polished Brass	with	No. 77	Carbide Can
No. 259	Gun Metal Finish	"	No. 77	" "
No. 256	Nickel Plated	"	No. 77	" "
No. 268	Polished Brass	"	No. 68	Extra Bottom
No. 269	Gun Metal Finish	"	No. 39	" "
No. 263	Nickel Plated	"	No. 31	" "
No. 427	Polished Brass	Lamp Only		
No. 428	Gun Metal Finish	" "		
No. 429	Nickel Plated	" "		

Equipped with No. 66 Air-Hole Lava Tips.



No. 78—Valve Stem.
For Lever Feed Lamps.
No. 16—Wire for No. 78.



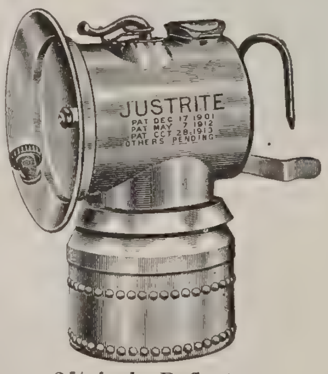
Weight
5
Ounces

Candle
16.7
Power

2¼-inch Reflector.

No. 124	Polished Brass	with	No. 77	Carbide Can
No. 125	Gun Metal Finish	"	No. 77	" "
No. 126	Nickel Plated	"	No. 77	" "
No. 121	Polished Brass	"	No. 68	Extra Bottom
No. 122	Gun Metal Finish	"	No. 39	" "
No. 123	Nickel Plated	"	No. 31	" "
No. 527	Polished Brass	Lamp Only		
No. 528	Gun Metal Finish	" "		
No. 529	Nickel Plated	" "		

Equipped with No. 28 Jewel Tip.



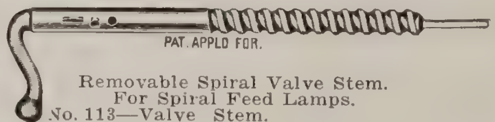
Weight
5
Ounces

Candle
18
Power

2⅝-inch Reflector.

No. 154	Polished Brass	with	No. 77	Carbide Can
No. 155	Gun Metal Finish	"	No. 77	" "
No. 156	Nickel Plated	"	No. 77	" "
No. 151	Polished Brass	"	No. 68	Extra Bottom
No. 152	Gun Metal Finish	"	No. 39	" "
No. 153	Nickel Plated	"	No. 31	" "
No. 547	Polished Brass	Lamp Only		
No. 548	Gun Metal Finish	" "		
No. 549	Nickel Plated	" "		

Equipped with No. 28 Jewel Tip.


PAT. APPLD FOR.

Removable Spiral Valve Stem.
For Spiral Feed Lamps.
No. 113—Valve Stem.

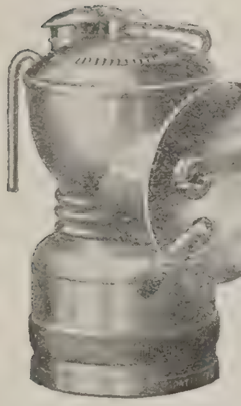
LARGEST MANUFACTURERS OF CARBIDE LAMPS.

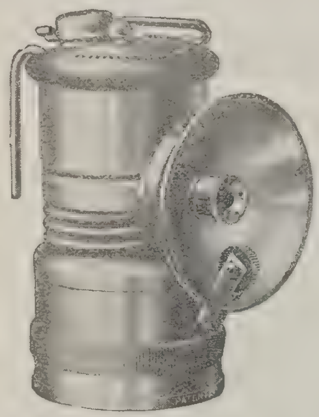
JOHN SIMMONS COMPANY

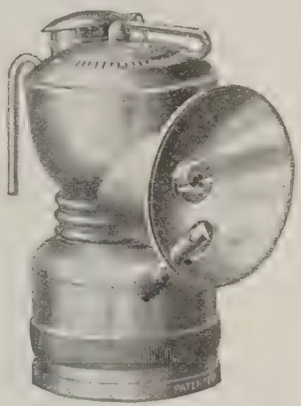
San Fransisco, Cal. NEW YORK Montreal, Can.

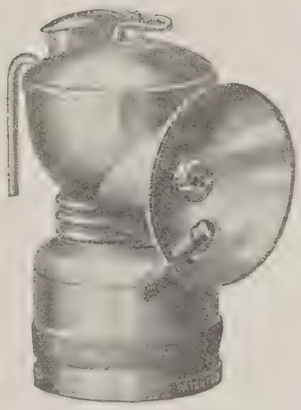
Manufacturers

Pioneer Carbide Lamps for Mine Use


No. 125


Hold-A-Lite


No. 130

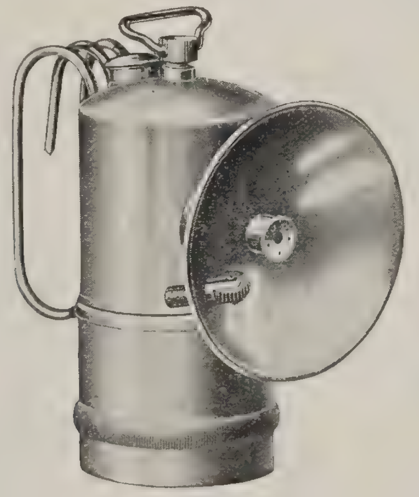

No. 132

No. 125—Bottom valve feed—Weight, 5½ ounces; Height, 4 inches. Burns 3 hours on one charge. Notches on top of lamp holds lever in position. Lamp equipped with spark lighter and one extra container. Price, complete.......$1.25

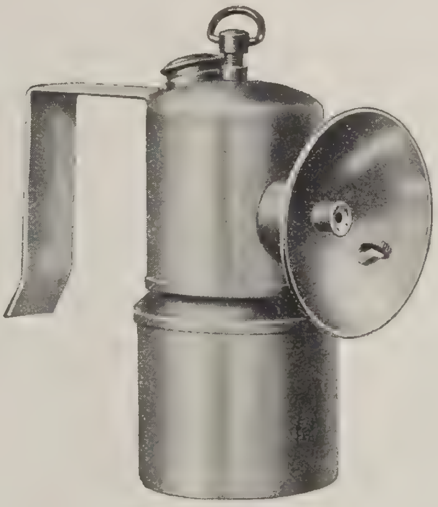
Hold-A-Lite—Bottom valve feed—Weight, 5⅞ ounces; Height, 3¾ inches. Burns 2½ hours on one charge. Notches on top of lamp holds lever in position. This lamp equipped with spark lighter, wind shield and two shot-proof carbide containers. Price, complete $1.25

No. 130—Automatic water feed—Weight, 5½ ounces; Height, 4 inches. Burns 3 hours on one charge. This lamp operates similar to the No. 132 but is equipped with a water shut-off. The valve on this lamp is constructed so that the light is not effected by the swing of the miners head as are other lever feed valve lamps. Price, complete. $1.25

No. 132—Automatic water feed—Weight, 5 ounces; Height, 4 inches. Burns 3 hours on one charge. The No. 132 is fitted with the patented Automatic Water Feed. The automatic regulation of the water makes hand regulation unnecessary. Lamp equipped with spark lighter and one extra container. Price, complete $1.25


No. 160 Float Feed.

No. 160—For Superintendents use—Operates with our new float feed. This lamp requires no attention during the entire life of the charge and will maintain an even steady flame. Burns 6 hours on one charge. Equipped with wind shield and one extra container. Price, each $2.50


No. 204 Float Feed.

No. 204—Trip Lamp—Handle just fits over rear of car and holds lamp rigid. Equipped with a wind shield so cannot be blown out. Acts as a warning to track walkers. Burns 12 hours on a charge. Price, each $3.75

All Lamps Fitted with Lava Burners, Rigid Removable Reflector and Spark Lighter.

We can furnish any of these lamps either with or without the wind shield or shot-proof feature and with various equipment such as hooks, reflectors, etc. When desired we can furnish a ½ lb. carbide can at same price as extra container.

UNION CARBIDE SALES COMPANY

NEW YORK
30 East 42nd St.

CHICAGO
Peoples Gas Bldg.

SAN FRANCISCO
Kohl Bldg.

Sole Distributors of

Highest Gas Yield

"Miners Lamp" Union Carbide

World's Best Quality

Manufactured by the Union Carbide Company, the Original Producers of Commercial Calcium Carbide and the Largest Manufacturers of This Product in the World.

"Miners Lamp" is a size of **"Union Carbide"** specially selected and adapted for use in miners' carbide lamps.

For the convenience of miners it is packed in 100-lb. and 25-lb. steel drums; also in 2-lb. and 10-lb. metal cans. All packages containing **"Miners Lamp" Union Carbide** are plainly marked and finished in **gray with blue bands.**

These **blue** and **gray** packages, easily identified, protect users against substitution and act as a guarantee that the contents are genuine **"Miners Lamp" Union Carbide,** acknowledged "The world's best quality."

This high quality is the result of the use of purest raw materials, improved and exclusive manufacturing methods supervised by engineers connected with the Carbide Industry since its inception.

"Miners Lamp" Union Carbide is used today by 500,000 miners, who demand the best and will take no other.

Warehouses of the Union Carbide Sales Company are located at the following points:

- ALABAMA
    - Birmingham
    - Mobile
    - Montgomery
- ARIZONA
    - Phoenix
- CALIFORNIA
    - Eureka
    - Fresno
    - Los Angeles
    - Sacramento
    - San Diego
    - San Francisco
- COLORADO
    - Denver
    - Victor
- CONNECTICUT
    - Hartford
- DISTRICT OF COLUMBIA
    - Washington
- FLORIDA
    - Jacksonville
    - Tampa
- GEORGIA
    - Atlanta
    - Savannah
- ILLINOIS
    - Chicago
    - Decatur
    - East St. Louis
    - Marion
    - Monmouth
    - Quincy
    - Streator
- INDIANA
    - Evansville
    - Indianapolis
    - Terre Haute
- IOWA
    - Des Moines
    - Dubuque
    - Ottumwa
    - Sioux City
- KANSAS
    - Pittsburg
    - Salina
    - Wichita
- KENTUCKY
    - Louisville
- LOUISIANA
    - New Orleans
- MAINE
    - Portland
- MARYLAND
    - Baltimore
    - Cumberland
    - Salisbury
- MASSACHUSETTS
    - Boston
    - Cambridge
    - Springfield
- MICHIGAN
    - Detroit
    - Grand Rapids
- Hancock
    - Iron Mountain
    - Jackson
    - Saginaw
    - Sault Ste. Marie
- MINNESOTA
    - Minneapolis
    - Virginia
- MISSISSIPPI
    - Vicksburg
- MISSOURI
    - Kansas City
    - St. Joseph
    - St. Louis
- NEBRASKA
    - Omaha
- NEW HAMPSHIRE
    - Concord
- NEW JERSEY
    - Camden
    - Jersey City
- NEW YORK
    - Albany
    - Binghamton
    - Geneva
    - Jamaica
    - Kingston
    - New York City
    - Niagara Falls
    - Poughkeepsie
    - Utica
    - Watertown
    - Whitehall
- NORTH CAROLINA
    - Wilmington
- NORTH DAKOTA
    - Fargo
- OHIO
    - Cincinnati
    - Cleveland
    - Columbus
    - Dayton
    - Lima
    - Toledo
    - Zanesville
- OKLAHOMA
    - Oklahoma City
- OREGON
    - Portland
- PENNSYLVANIA
    - Beaver
    - Du Bois
    - Erie
    - Harrisburg
    - Johnstown
    - Pittsburgh
    - Pottsville
    - Scranton
    - Williamsport
- RHODE ISLAND
    - Providence
- SOUTH CAROLINA
    - Charleston
- TENNESSEE
    - Chattanooga
    - Knoxville
    - Memphis
    - Nashville
- TEXAS
    - Dallas
    - El Paso
    - Houston
    - San Antonio
    - Waco
- UTAH
    - Salt Lake City
- VIRGINIA
    - Lynchburg
    - Norfolk
    - Richmond
- WEST VIRGINIA
    - Bluefield
    - Charleston
    - Fairmont
    - Huntington
- WASHINGTON
    - Seattle
    - Spokane
- WISCONSIN
    - La Crosse
    - Madison
    - Milwaukee

Practically all jobbers and dealers in mine supplies handle **"Miners Lamp" Union Carbide.**

KEYSTONE
THE.
MINING
CATALOG
COMBINED WITH
COAL FIELD
DIRECTORY
CONSOLIDATED PUBLISHING
COMPANY INC.

SAFETY FIRST AND FIRST AID SECTION

The following concerns have catalogue descriptions in this section:

Draeger Oxygen Apparatus Co.
Life Saving Devices Co.
Mine Safety Appliances Co.
Provident Life & Casualty Co.
Safety First Supply Co.
Stonehouse Steel Sign Co.
Williams Improved Stretcher Co.

For additional descriptions of Safety First and First Aid Equipment, not appearing in this section, refer to Index of Products in front of book.

THE DRAEGER OXYGEN APPARATUS CO.

422 FIRST AVE., PITTSBURGH PA.

Complete Mine Rescue Apparatus

and Pulmotors for Resuscitation

Agents for the Wolf Safety Lamp Company of America.

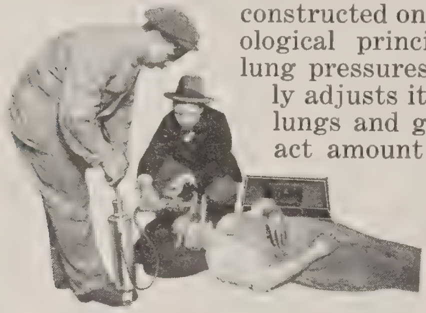
MADE IN AMERICA

All Draeger Equipment is now made in America at our own Pittsburgh Plant.
This assures you of prompt deliveries and satisfactory service.

The New Type "B" Pulmotor

The first hand-operated resuscitation device fully efficient and entirely safe whether in the hands of a physician or layman.

The Only Hand Device Correct in Principle. It is the only hand-operated resuscitation machine constructed on the correct physiological principle of measured lung pressures. It automatically adjusts itself to any pair of lungs and gives them the exact amount of air or oxygen they naturally inhale and exhale and at their normal rate of respiration.



Patient Free to Breathe. The only hand-operated machine that permits the patient to breathe of his own accord while mask is on.

Indicators Show Patient's Condition. They show the patient's first attempts to resume breathing and enable the operator to keep in time with him and his efforts.

Unlimited Flexibility. Can be regulated to meet the needs of any case accurately and exactly.

Weighs only 12 lbs., complete with carrying case and all accessories. Detailed instructions with each instrument. Price $115.00.

The Standard Pulmotor

Endorsed by every physician who has ever used it. Never known to fail where other than lung conditions permitted.

Used exclusively by the leading hospitals throughout the world and by the great mining companies, and public utility corporations. Also the various branches of the U. S. Medical Service, Panama Canal Commission, the War, Navy and Interior departments.

The correctness of its principle and simplicity of its operation insure its successful application even in the hands of the inexperienced.

Draeger Rescue Apparatus

Draeger Breathing Apparatus are the Standard of the World and have proved successful under conditions of use in smoke, acid, and alkali fumes, poisonous gases, mine accidents, etc.

The Draeger Self Rescue Apparatus enables entombed men and rescuers to begin work immediately while waiting for the Rescue Crew. Weighs only 6½ lbs. and when put together is no larger than a lady's hand-bag. Can be adjusted in a few seconds.

Draeger Rescue Apparatus bears the approval of the Bureau of Mines and is used by the

- U. S. Bureau of Mines.
- State Inspection Departments.
- Phila. & Reading Coal & Iron Co.
- Lehigh Valley Coal Co.
- Delaware, Lackawanna & Western Coal Co.
- H. C. Frick Coke Co.
- Republic Iron & Steel Co.
- United Coal Co.
- Union Pacific Coal Co.
- Colorado Fuel & Iron Co.
- Rocky Mountain Fuel Co.
- Utah Fuel Co.
- Northwestern Improvement Co.

Team that won first prize at the San Francisco Mine Rescue Contest. Team is from Sunnyside Mine of Utah Fuel Co.

LIFE SAVING DEVICES CO.

Main Office and Works
180 N. Market Street, CHICAGO, ILL
Branches:
NEW YORK, 1008 Times Bldg. BOSTON, 53 Devonshire St.
PITTSBURGH, Mine Safety Appliances Co.

THE LUNGMOTOR

What the Lungmotor Does

The Lungmotor does the very next thing to normal breathing because it supplies—mechanically—the tidal volume of air each respiration (the amount you breathe at rest)—enough air, but not so much as to possibly injure the lung tissues and the circulation, thus not leaving the patient open to pneumonia.

It is safe because it does not depend upon back pressure in the lungs to operate from inspiration to expiration and vice versa.

You can always give air.

You can give **any** mixture of oxygen and air by instant adjustment.

You can instantly adjust from newborn to largest adult.

You can at will increase or decrease respirations per minute.

You can increase or decrease air volume, or air oxygen volume per respiration.

You can work fast or slow—give small or large air volume—changeable at will.

You can help in the effort to breathe without taking off the face-mask.

You can take care of all water and mucus from the lungs in cases of apparent drowning, without removing the face mask.

You can prevent air going into the stomach **not** by holding your finger on the larynx but by a patented throat tube requiring no attention—very simple and yet **sure.**

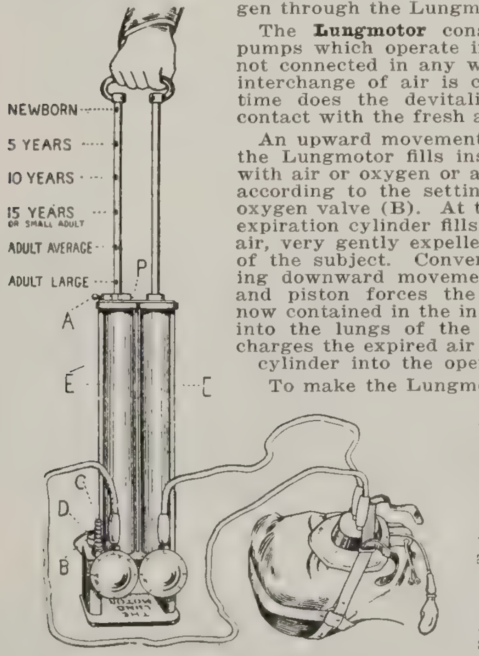
You can cause inspiration without expiration—expiration without inspiration. (This is accomplished without tracheal tubes.)

Should a face mask become damaged or the rubber pad on the face become destroyed you still can give the patient air or oxygen.

How Lungmoter Works

This cut (1) shows Lungmotor giving air only (air contains 20.96 per cent oxygen). If you want additional oxygen, you can attach to any kind of oxygen tank, not missing a single air giving stroke. When oxygen container attached, turn valve "B" (see cut 1) and you can then, by observing the volume indicator thereon, give any mixture of air and oxygen through the Lungmotor desired.

Cut No. 1.



The **Lungmotor** consists of two air pumps which operate in unison, yet are not connected in any way as far as the interchange of air is concerned. At no time does the devitalized air come in contact with the fresh air or oxygen.

An upward movement of the handle of the Lungmotor fills inspiration cylinder with air or oxygen or a mixture of both, according to the setting of the air and oxygen valve (B). At the same time the expiration cylinder fills with the expired air, very gently expelled from the lungs of the subject. Conversely, the following downward movement of the handle and piston forces the air and oxygen now contained in the inspiration cylinder into the lungs of the subject and discharges the expired air of the expiration cylinder into the open.

To make the Lungmotor available for persons of all ages and correspondingly varying lung capacities the Lungmotor is provided with adjustments for different air volume suitable for new-born, five year old, ten year old, fifteen year old or small adult, adult average and adult large. This provides for all sizes of subject.

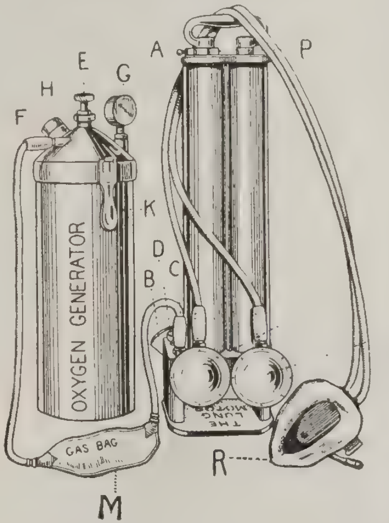
Now note volume notches on the inspiration piston rod opposite to each of the sizes of subject, viz: New-born, five years old, ten years old, fifteen years old or small adult, adult average and adult large. These volume notches are engaged by the slide pin. (A.) (See Cut No. 1) on top of the inspiration cylinder cover. This slide pin can be swung around the circle over the graduated volume, size, and stroke regulating dial, the graduations with plain marks for corresponding ages registering with the notches in the piston rod.

The Lungmotor

Cut shows the Lungmotor with Oxygen Generator and face mask ready to place on patient.

Explanation of the Cut

(A) Movable pin which turns by gently pulling and adjusts the **Lungmotor** from new-born to the largest adult.



Connected to Oxygen Generator

(B) Mixing valve, whereby all air, all oxygen or any percentage of either may be given. Always under instant control of operator by a twist of the thumb screw.

(C) Oxygen inlet.

(D) Screened air inlet valve.

Oxygen Generator which connects by tube and gas bag with the Lungmotor and makes fresh, pure oxygen alongside the subject just as needed.

(E) Needle valve which regulates the making of oxygen.

(F) Outlet for oxygen gas.

(G) Pressure gauge.

(H) Safety valve.

(P) Pointer on the movable adjusting pin (A)and tells when Lungmotor set to right size patient.

(R) Metal face mask with soft rubber covering to go over face and nose.

Anyone Can Use It

Lungmotor always available, because anybody can use it. In the recent New York City subway fire it was used successfully by persons who had never seen the instrument before.

Adopted By U. S. Bureau of Mines

In 1912 two commissions composed of technical experts and physiologists were appointed to investigate the subjects of: Resuscitation from Mine Gases and Resuscitation from Electric Shock.

The reports of these commissions, in effect, establishes a standard for devices intended for use in inducing respiration mechanically, and have attracted widespread attention.

The U. S. Bureau of Mines after the issuance of these reports stopped using Resuscitation Devices of another make and removed them from all mine rescue cars and stations, and after nineteen months of careful investigation by technical experts and physicians, has just bought Lungmotors to take their place.

The Lungmotor met physiologically and mechanically every requirement and test of these commissions.

No device ever received closer scrutiny by reason of the universal interest in, and the importance of the subject, which culminated in the reports of these two commissions. Thus, securing this order from the Bureau of Mines gave the Lungmotor a tremendous victory.

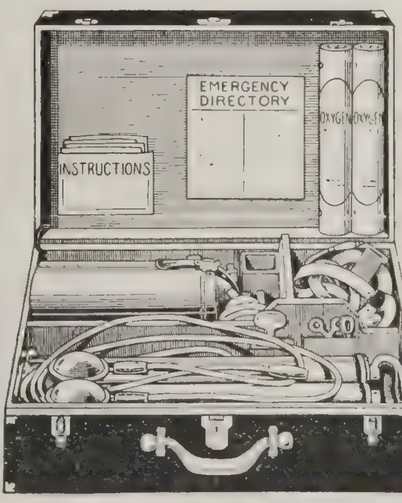
Awards

The highest awards to the Lungmotor at the Panama Pacific International Exposition, 1915, Gold Medal of Honor by Mining Jury, and Gold Medal by Liberal Arts Jury. American Exposition of Safety and Sanitation, New York City, 1914, Grand Prize and Gold Medal.

Lungmotor Complete in Case as **shown in cut $150.**

Lungmotor without oxygen generator, but complete for connection with any oxygen container **$135.**

Prices f. o. b. Chicago. 30 days net, 2% 10 days.



The Lungmotor Outfit Complete.

MINE SAFETY APPLIANCES CO.

539-541 FOURTH AVENUE, PITTSBURGH, PA.

Safety Engineers

Everything for Mine and Industrial Safety Safety Appliances Exclusively
The Standard Equipment in Each and Every Line Carried

Edison Electric Safety Mine Lamps, Approved Bulbs for Electric Lamps, Stonehouse Steel Signs, Fleuss Proto Mine Rescue Apparatus, Western Electric Mine Phones, Minimax Fire Extinguishers, Stokes Stretchers, Dupont Shot Firing Batteries, Tycos Anemometers & Barometers, Koehler Flame Safety Lamps, M. S. A. Lamp Testing Box, The Lungmotor, Safety Bulletin Boards, Sylat Post Pullers, Pyrene Fire Extinguishers, Williams' Stretchers, Davis Shot Firing Batteries, Davis Anemometers.

Look on Page 576 for Edison Mine Lamps.
Look on Page 589 for Lungmotors.
Look on Page 580 for Koehler Safety Lamps.
Look on Page 594 for Stonehouse Steel Signs.
Look on Page 595 for Williams' Stretchers.

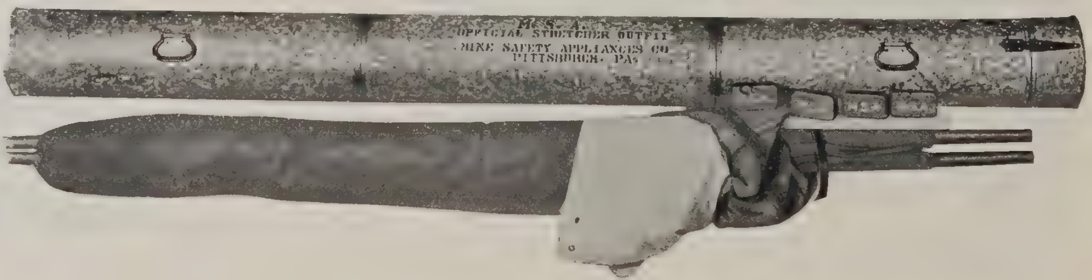
Combined with our engineering force the above enables us to give you

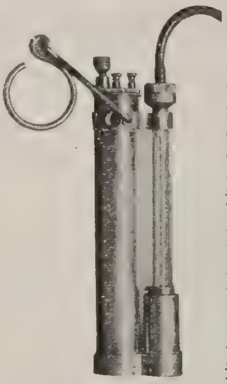
SAFETY—EFFICIENCY—SERVICE

M. S. A. First Aid Cabinet

Small, compact, everything necessary is included. Contents: 1 Steel Box; 2 Keys for same; 1 Tourniquet; 2 Army Compresses; 1 Doz. Swabs; 2 Small Safety Pins; 6 Large Safety Pins; 1 No. 1 Packet containing: 1 Sq. Aseptic Lint, 1 Triangular Bandage, 1 Doz. Safety Pins;—1 Burn Dressing Packet containing: 4 pcs. Picric Acid Gauze, 1 Triangular Bandage, 2 Safety Pins;—1 Special Z. O. Plaster, ½" x 2½ yds.; 1 Pair Scissors; 1 2-oz. Bottle Iodine; 1 Specimen Bottle Water; 1 yd. Plain Gauze; 2-1 yd, Absorbent Cotton; 2 Plain Bandages, 4" x 10 yds.; 9 Plain Bandages 1" x 10 yds.; 5 Plain Bandages, 2½" x 10 yds.

M. S. A. Official Approved Stretcher Outfit, galvanized iron cannister containing stretcher, pair wool blankets, water-proof blankets, first aid pocket packets and splints. Can be furnished also with rubberized cover instead of metal cannister where desired.





Burrell Gas Detector

Manufactured specially by us under the exclusive supervision of the Inventor. Can be furnished calibrated for methane, hydrogen, carbon-monoxide or any other volatile hydrocarbon gas. One-tenth of one per cent of methane can be detected with this instrument.

M. S. A. Approved Emergency Hospital Equipment

Any combination of the following material can be furnished: 1 Chair with head rest and removable arm with basin attachment and basin for hand dressing; 1 foot dressing stand and basin attachment; 1 Plain Chair; 1 Couch and cushion, blanket and pillow; 1 Instrument Tray; 1 Pitcher; 1 Basin; 1 Instrument Table; 1 Cabinet filled with supplies; - Sterilizer and burner with deep base for sterile water; 1 Stretcher; 1 Wool Blanket; 1 Irrigator; 1 Waste Pail; 1 Irrigator, Tubing and Irrigator Tips; 1 Dozen Towels with "Emergency Room" woven in same; 1 Operating Table with cushion.

M. S. A. Shot Firing Battery, safe and positive in its action. The only satisfactory equipment for individual shot firing service.

We are prepared to make up any special bandages and compresses desired.

M. S. A. Special Picric Gauze Packets 3½" x 2½".

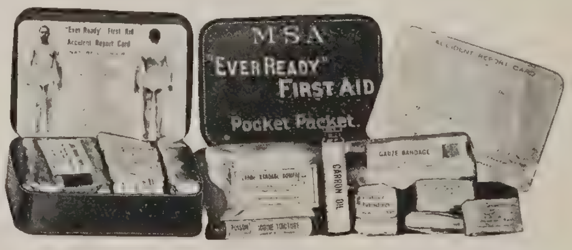
M. S. A. Special Triangular Bandages, 40".

M. S. A. Special Triangular Bandages, 36".

Put up in inlividual cartons. Also one-fourth and one dozen packages.

Bandage Compresses U. S. Bureau of Mines Standard in three sizes, Large, Medium, Small.

Individual Finger Dressings



M. S. A. Ever Ready First Aid Pocket Packet, the first aid man's choice. Including M. S. A. Accident Report Card.

SAFETY FIRST SUPPLY COMPANY

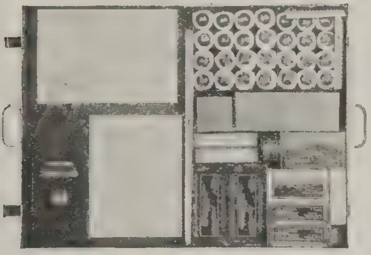
Offices and Salesrooms: Hartje Office Bldg.
Warehouse: No. 18 Wood Street
Pittsburgh, Pennsylvania

Safety Appliances and Equipment

Products

First Aid Cases, First Aid Pocket Packets, First Aid Charts; First Aid Books, Complete Hospital Equipment, Bulletin Boards, Enameled Signs, Goggles, Oxygen Helmets, and All Safety First and First Aid Equipment. Machinery Guards manufactured and erected.

Diamond No. 2 First Aid Case



Size: Length 20 ins., width 13 ins., depth 3½ ins.

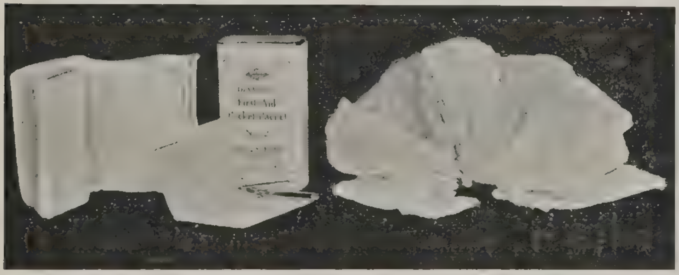
Weight: 12 lbs.

Contents:
Two First Aid for Wounds; Two Ounces Absorbent Lint; One Burn Dressing Packet; Four one yard packages Plain Gauze; Two quarter -pound packages Plain Gauze; One Spool Zinc-Oxide Adhesive Plaster, 1 in. wide; Four Plain Gauze Bandages, 1 in. x 10 yds.; Eight Plain Gauze Bandages, 2 in. x 10 yds.; Six Plain Gauze Bandages, 2½ in. x 10 yds.; Six Unbleached Muslin Bandages, 2 in. x 5 yds.; Six Unbleached Muslin Bandages, 2½ in. x 5 yds.; One Bottle Antiseptic Solution, U. S. P.; One Bottle Aromatic Spirits Ammonia; Three Ampoules Tinct. Iodine; One Jar Carbolated Petrolatum; One Tourniquet; Two Papers Safety Pins; One Pair Scissors; One Pair Tweezers; One First Aid Book.

Cabinet is made of heavy decorated metal and is provided with rings to hang cabinet against the wall and handles efficient for carrying.

The contents are so arranged that each item is readily accessible. We guarantee the contents of this case to not only fulfill the requirements of the Insurance Regulations and the Compensation Law but to consist of the essentials for First Aid and to be of the finest quality and material possible to obtain. Price of this case $6.00.

Diamond No. 2 First Aid Pocket Packet



The Diamond No. 2 First Aid Pocket Packet meets all the requirements of Insurance Companies and the Compensation Law. The packet consist of:

One standard 3-inch Compress
One standard Triangle Bandage
One card of Directions
One package of Safety Pins

Packed in a metal box which is hermetically sealed with adhesive tape, making an absolutely air-tight joint.

Each item can be removed without destroying the case or the other items, and can be replaced with new. The case is easily resealed with adhesive tape, making it once more complete. Each item of the contents is wrapped in moisture-proof transparent paper, all of the items are then rewrapped, making one complete unit. The contents of the Diamond No. 2 First Aid Pocket Packet are the same in shape, size, quality and every particular as is contained in the regulation U. S. Army Packet, and we guarantee them to fulfill the Insurance Regulations.

Price of Packets, complete, $2.75 per dozen.
Price of Contents only, $2.25 per dozen.

Diamond Emergency Outfits for First Aid Stations In Mines

Approved Equipment. Guaranteed to meet all Insurance Regulations.

The Diamond Emergency Outfit consists of: 1 Diamond No. 2 First Aid Case; 1 Diamond-Williams Stretcher; 1 Diamond Heavy Woolen Blanket; 1 Diamond Heavy Rubber Blanket; 1 Diamond Galvanized Iron Canister.

Complete for $24.50.

1 Diamond No. 2 First Aid Case Described and illustrated on this page.	$6.00
1 Diamond-Williams Stretcher Described and illustrated on page 595 of this catalogue.	$5.00
1 Diamond Heavy Woolen Blanket This Blanket is guaranteed to be all wool and to measure 66" x 84". It is gray in color and the most serviceable and efficient Blanket we can produce.	$5.00
1 Diamond Heavy Rubber Blanket This Rubber Blanket is manufactured especially for this outfit, of the best materials obtainable, is rubber both sides, provided with grommets, and measures 45" x 84"; 12" longer than any other Emergency Rubber Blanket.	$3.00
1 Diamond Galvanized Iron Canister This Canister is manufactured of 24-gauge galvanized iron, reinforced, and is 7½ ft. long by 10 in. inside diameter. The top fits tightly over the end. This Canister will hold the Stretcher, Woolen Blanket, Rubber Blanket and First Aid Packets, and is guaranteed to keep them absolutely free from dampness. This Canister is built in direct accordance with the Insurance Recommendations.	$5.50

We guarantee the above Outfit to be the most efficient produced by any manufacturer. Each and every item therein is of the best quality obtainable.

We urge the installation of the Diamond Emergency Outfit in its entirety.

Diamond Emergency First Aid Chart

Heavy, serviceable cloth, large type, two colors, easily read. Itself a real First Aid.

INSTRUCTIONS
FOR
FIRST AID TO INJURED
Published by Safety First Supply Co. Pittsburgh, Pa.
PREVENT CROWD GATHERING AROUND INJURED

This chart should be hung up for easy reference in every foreman's office, every First Aid room, every Emergency Hospital in your mine.

"What to do" in case of accident shown at a glance. No hunting for book of instruction—no paging through to find the vital information — a glance at picture and text and you are ready to render the necessary "First Aid."

Strong, serviceable cloth, on wood roller and hanger, printed in large type, fully illustrated, two colors.

Price $1.00 each.

"Diamond" Emergency Hospital Equipment No. 1 Consists of:

Furniture:

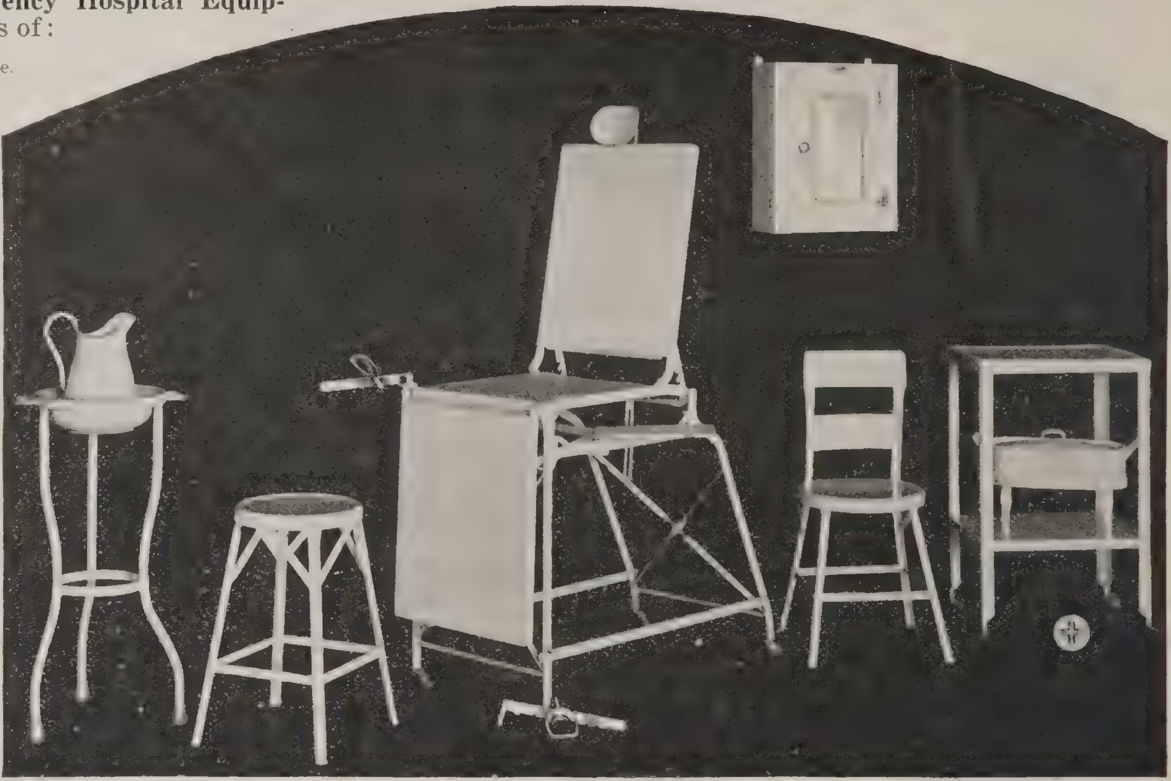
1 U. S. Operating Table.
1 Stand with Two Porcelain Shelves.
1 Steel Wall Cabinet with Mirror.
1 Single Basin Stan with Basin.
1 2-quart Pitcher.
1 Steel Chair wit Back.
1 Steel Stool.
1 Sterilizer with Stan

Every item liste above is of heav steel constructio and heavily coate with white porcelai enamel.

Accessories:

5 Pkgs. Plain Steril Gauze, 1 yd. pkgs.
1 Jar Iodoform Gauz 5%.
1 Doz. 1-inch Gauz Bandages.
1 Doz. 2-inch Gauz Bandages.
1 Lb. Absorbent Cotton, 4 oz. packages.
1 Roll Z. O. Adhesiv Plaster, 1 inch wid
1 Jar Plain Sterile Catgut, 3 sizes.
1 Jar Plain Sterile Silk, 3 sizes.
1 Scalpel.
2 Pean's Haemostats.
1 Doz. Needles, assorted.
1 Pr. Scissors, Straight
1 Gross Safety Pins medium.

Price Complete, $60.00



The Furniture and Accessories in the above list are of the best material obtainable and are guaranteed to be the necessities for First Aid.

We guarantee this outfit to meet all the requirements of the Insurance Companies and the Compensation Law.

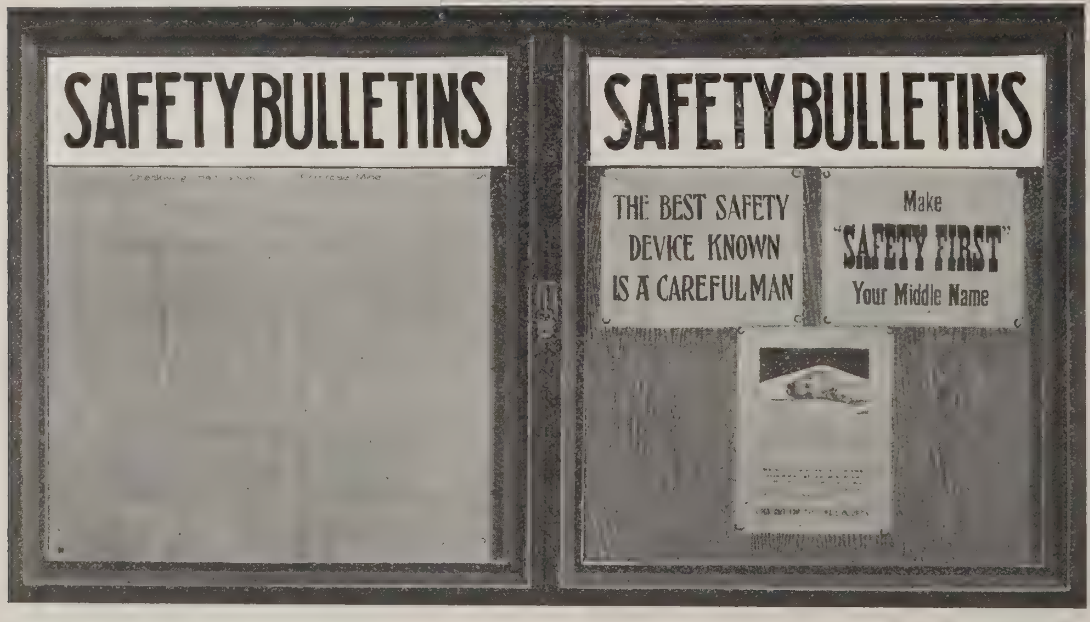
Three-Room Emergency Hospital Equipment

The Outfits shown above, combined with a requisite number of beds to constitute a ward and furniture necessary for a receiving room, will fulfill all of the requirements of a three-room hospital equipment. Prices on this additional equipment will be gladly furnished upon request.

Diamond Bulletin Board No. 56. Weather-Proof. Durable. Attractive.

Electrically Illuminated. Two lamps on each side, illuminating the green glass sign "SAFETY BULLETINS," and reflecting downward illuminating the posted Notices and Bulletins.

Constructed Entirely of 22-Gauge Metal, with heavy coat of green enamel. Wood panel in back for posting Bulletins.


SAFETY BULLETINS
SAFETY BULLETINS
THE BEST SAFETY DEVICE KNOWN IS A CAREFUL MAN
Make "SAFETY FIRST" Your Middle Name

Size 56 x 30 Inches, Price $25.00

Two Glass Doors each 28 x 30 inches.

Straps for Hanging.

Wired in Accordance with the Insurance Standards to suit the voltage at your plant.

Diamond Bulletin Board No. 56 is designed to hold large Factory or Plant Notices, such as Miners' Weight Sheets, besides six to eight Safety Bulletins.

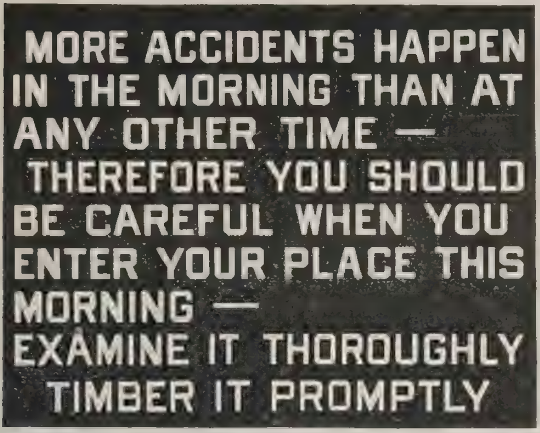
Bulletins issued by the National Safety Council, National Fire Prevention Association, State Department of Labor and Industry, Insurance Carrier or their equivalent, are especially recommended.

Shipped complete with thumb tacks and lamps.

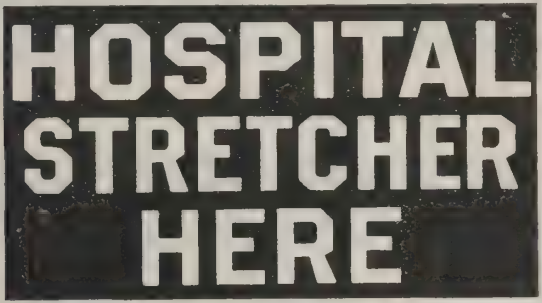
The Diamond Bulletin Board is positively the most efficient, ornamental and durable Bulletin Board on the market today.

Diamond Porcelain Enamel Signs

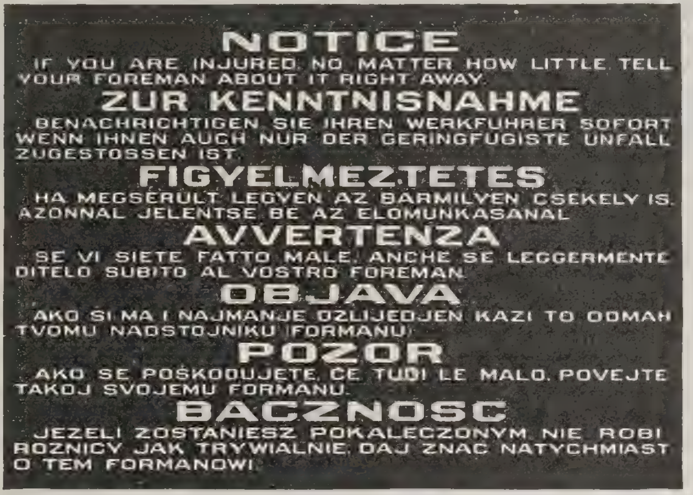
All of our signs, except No. 15-A and No. 15-B, are manufactured of five coats of **Porcelain Enamel**, fused at 2000 degrees heat on **18-gauge iron.** We guarantee this sign to stay bright and clean, to be unaffected by weather conditions or acid fumes, and to last indefinitely. Screw holes are each protected with patent collar, eliminating danger of injury to sign when posting. A sign should be as effective five years from date of posting as five days.


MORE ACCIDENTS HAPPEN IN THE MORNING THAN AT ANY OTHER TIME —
THEREFORE YOU SHOULD BE CAREFUL WHEN YOU ENTER YOUR PLACE THIS MORNING —
EXAMINE IT THOROUGHLY
TIMBER IT PROMPTLY

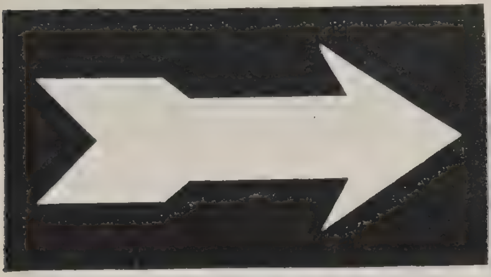
No. 119, Size 18 x 14", Blue Background, White Letters.



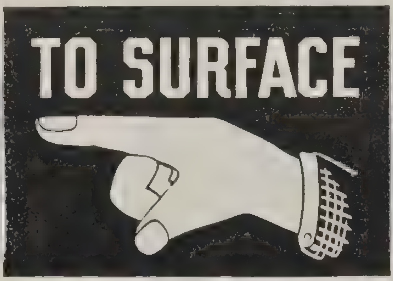
No. 132, Size 18 x 10", Green Background, White Letters


NOTICE
IF YOU ARE INJURED, NO MATTER HOW LITTLE TELL YOUR FOREMAN ABOUT IT RIGHT AWAY.
ZUR KENNTNISNAHME
BENACHRICHTIGEN SIE IHREN WERKFUHRER SOFORT WENN IHNEN AUCH NUR DER GERINGFUGISTE UNFALL ZUGESTOSSEN IST.
FIGYELMEZTETES
HA MEGSERULT LEGYEN AZ BARMILYEN CSEKELY IS. AZONNAL JELENTSE BE AZ ELOMUNKASANAL
AVVERTENZA
SE VI SIETE FATTO MALE, ANCHE SE LEGGERMENTE DITELO SUBITO AL VOSTRO FOREMAN.
OBJAVA
AKO SI MA I NAJMANJE OZLIJEDJEN KAZI TO ODMAH TVOMU NADSTOJNIKU (FORMANU)
POZOR
AKO SE POSKODUJETE, CE TUDI LE MALO, POVEJTE TAKOJ SVOJEMU FORMANU.
BACZNOSC
JEZELI ZOSTANIESZ POKALECZONYM NIE ROBI ROZNICY JAK TRYWIALNIE, DAJ ZNAC NATYCHMIAST O TEM FORMANOWI.

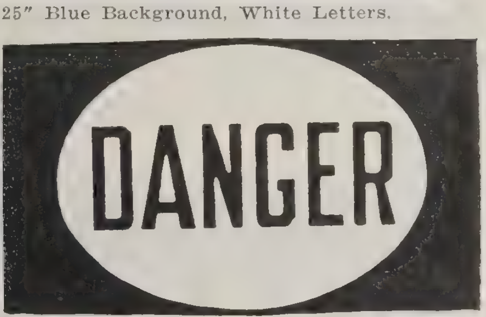
No. 267, Size 36 x 25" Blue Background, White Letters.



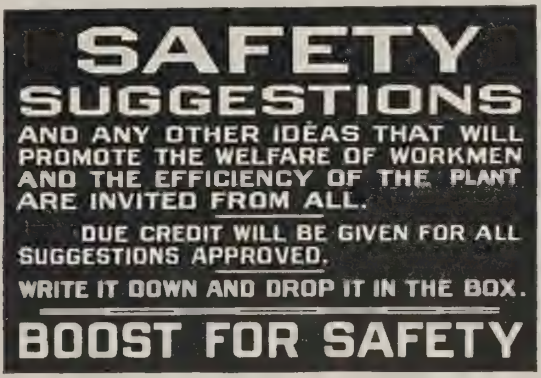
No. 15-A, Size 15 x 8", Black Background, White Arrow. Manufactured of lithographed enamel on 24-gauge iron.



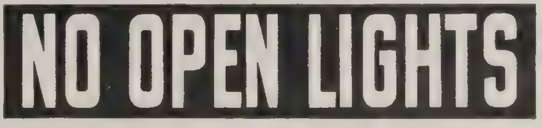
No. 224, Size 9 x 6½", Green Background, White Letters and Figure.



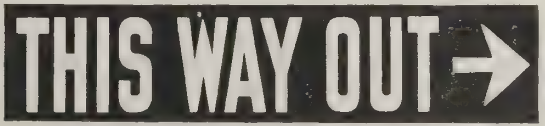
No. 15B, Size 24 x 10", Black Background, Red Circle with White Letters, Manufactured of lithographed enamel on 24-gauge iron.


SAFETY SUGGESTIONS
AND ANY OTHER IDEAS THAT WILL PROMOTE THE WELFARE OF WORKMEN AND THE EFFICIENCY OF THE PLANT ARE INVITED FROM ALL.
DUE CREDIT WILL BE GIVEN FOR ALL SUGGESTIONS APPROVED.
WRITE IT DOWN AND DROP IT IN THE BOX.
BOOST FOR SAFETY

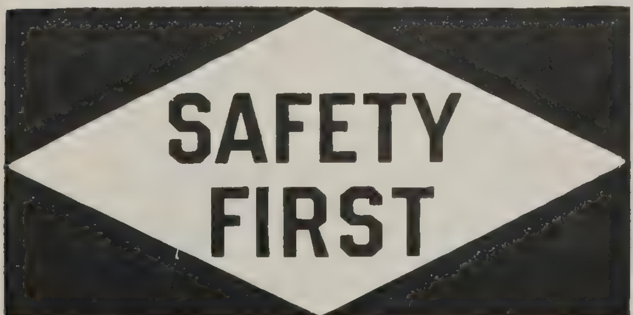
No. 113, Size 18 x 12", Green Background, White Letters.



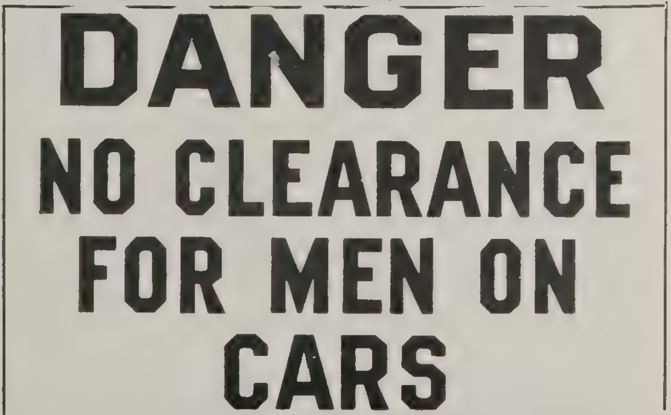
No. 290, Size 16 x 4", Green Background, White Letters.



No. 289, Size 16 x 4", Red Background, White Letters.



No. 294, Size 14 x 10", White Background, Green Diamond, White Letters.



No. 7, Size 14 x 10" White Background, Red Letters.

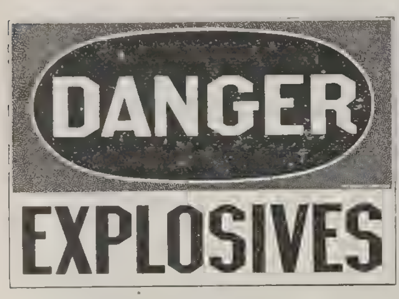
THE STONEHOUSE STEEL SIGN CO.

CLAYTON BLOCK, DENVER, COLO.

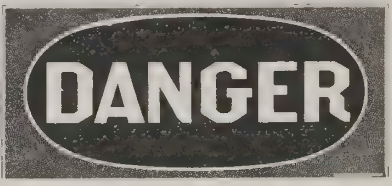
Mine Safety Appliances Co., 539-41 Fourth Avenue, Pittsburgh, Pa.
Agents for Pennsylvania and Kentucky.

Striking---Attention Arresting, Accident Prevention, Signs, Safety Bulletin Boards
Danger and Safety Tags

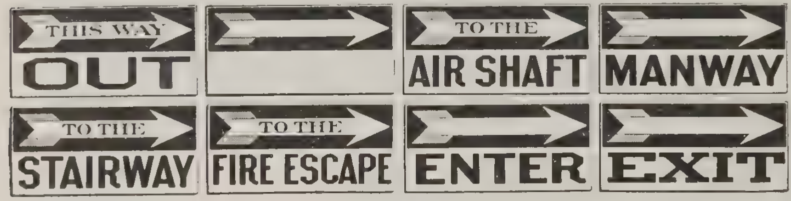
Which of These Signs Below is the Practical DANGER Sign



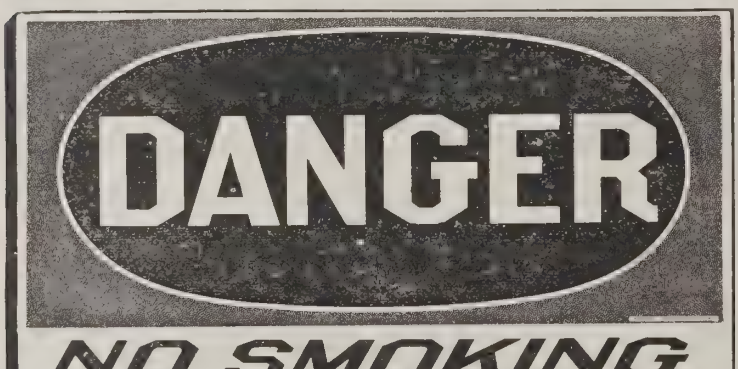
This style of sign mentions the specific DANGER, giving you a chance to protect yourself, employees and the public.

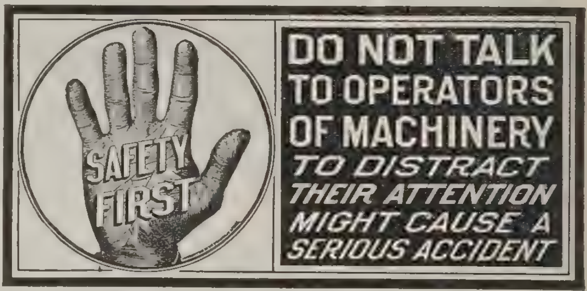


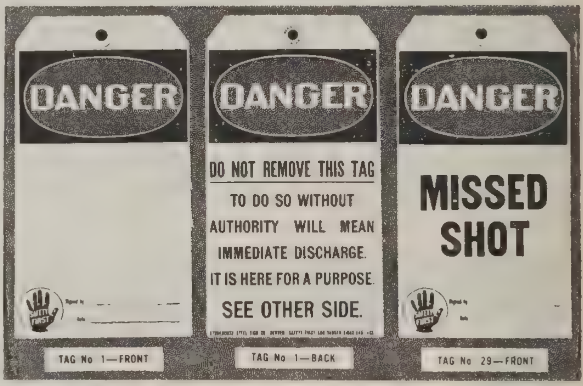
This style sign does not advise where the DANGER exists, whether overhead, under foot, to the right or left, in front, or behind.

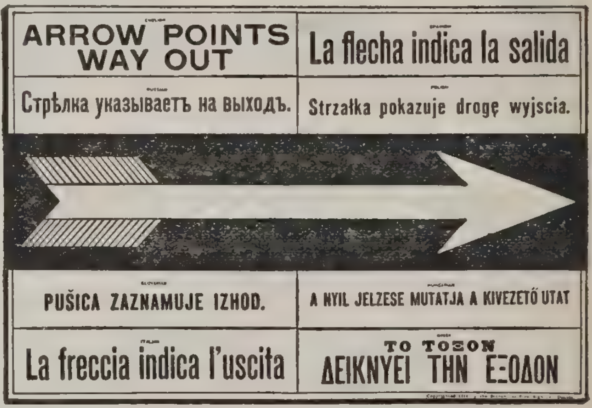


What has been said here of Danger Signs also applies to Arrow Signs. The Arrow indicates direction, but unless the thing is indicated it loses much of its force.


DANGER
NO SMOKING,
MATCHES OR OPEN LIGHTS
Воспрещается КУРИТЬ,
ЗАЖИГАТЬ СПИЧКИ И ДЕРЖАТЬ ОГОНЬ ОТКРЫТЫМЪ
VIETATO FUMARE - PORTARE
FIAMMIFERI O LAMPADE APERTE
KADITI PREPOVEDANO
NE RABITE ŽIGICE ALI ODPRTE SVETILNICE
Nie wolno palić
Zapałek i innych świateł
TILOS A DOHÁNYZÁS
GYUFA VAGY NYILT LÁNG HASZNÁLATA
ΑΠΑΓΟΡΕΥΕΤΑΙ ΤΟ ΚΑΠΝΙΣΜΑ
ΣΠΙΡΤΑ Η ΑΝΑΜΜΕΝΑ ΦΩΤΑ
INGEN TOBAKSRYGNING
TAENDSTIKKER ELLER AABNE LYS
Ingen Rökning, Tändstickor
eller Oskyddadt Ljus.
PUŠENJE ZABRANJENO
NE UPOTREBLJUJTE ŽIGICE
ILI OTVORENE SVETILJKE
KOUŘENÍ ZAKÁZÁNO
NEPŘIBLIŽUJTE SE SIRKAMA NEB S OHNĚM
Esta Prohibido Fumar
Y LLEVAR FOSFOROS Y LUCES ABRIDAS
Rauchen, Streich-Hoelzer oder
offene Lichter verboten
ПУШЕЊЕ ЈЕ ЗАБРАЊЕНО.
Несмијеш се служити шибицом или
ма каквом отвореном ватром.
EI TUPAKOIMISTA EI
TULITIKKUJA EIKÄ AVONAISTA
VALKEAA SALLITA
NEVALE RUKYT
ar laikyt pas save briežukų ar kitokių
atvirų ugnių
ON NE VOUS PERMET PAS ICI DE FUMER
NI DE PORTER D'ALLUMETTES ET DE
LUMIERES OUVERTES
The equivalent of the statement, "No Smoking, Matches or Open Lights," appears in each language indicated






ARROW POINTS
WAY OUT
La flecha indica la salida
Стрѣлка указываетъ на выходъ.
Strzałka pokazuje drogę wyjscia.
PUŠICA ZAZNAMUJE IZHOD.
A NYIL JELZESE MUTATJA A KIVEZETŐ UTAT
La freccia indica l'uscita
ΤΟ ΤΟΞΟΝ
ΔΕΙΚΝΥΕΙ ΤΗΝ ΕΞΟΔΟΝ

Accident Prevention Signs

Not a jumble of words on a steel plate, but real Safety signs with a punch.

Signs that prevent accidents because their quality is so striking, so attention arresting, that they are rightfully termed Accident Preventors.

Three hundred or more different kinds of these signs are in stock today ready for immediate shipment and they are ready every day.

Our signs are the best money can buy in both material and workmanship (of course), but the main thing is that they are STANDARD.

No other sign company in the United States emphasizes this fact, but from a money-saving standpoint it is very essential. Ask any Insurance Man or Mine Inspector.

The real story of signs can't be told in a one-page advertisement.

Send for our free illustrated folder.

Williams' Improved Stretcher Company

No. 1202-1204 Water Street, Wheeling, W. Va.

"IT CUTS THE PAIN IN HALF"

(Williams' Improved Humane Stretcher)

Williams' Improved Mine Stretcher once tried always adopted.

The largest employers of labor in the United States are our regular customers.

Our Stretcher does away with the agony of **unnecessary** handling.

Cut below shows Stretcher being removed from patient, instead of dragging or lifting patient from Stretcher.

If you want to compare our Stretcher you must have **two**, for you can't compare it with any other make. The only **real** improvement in 50 years.

Economical. Because you can buy extra cots, the handles, spreaders and legs last forever.

Sanitary. Because it is sold in a dust-proof bag, always clean, ready for use, when soiled can be washed like a towel.

Humane. "It cuts the pain in half." It does away with one lifting. "Nuf Ced."

SEND FOR BOOKLET

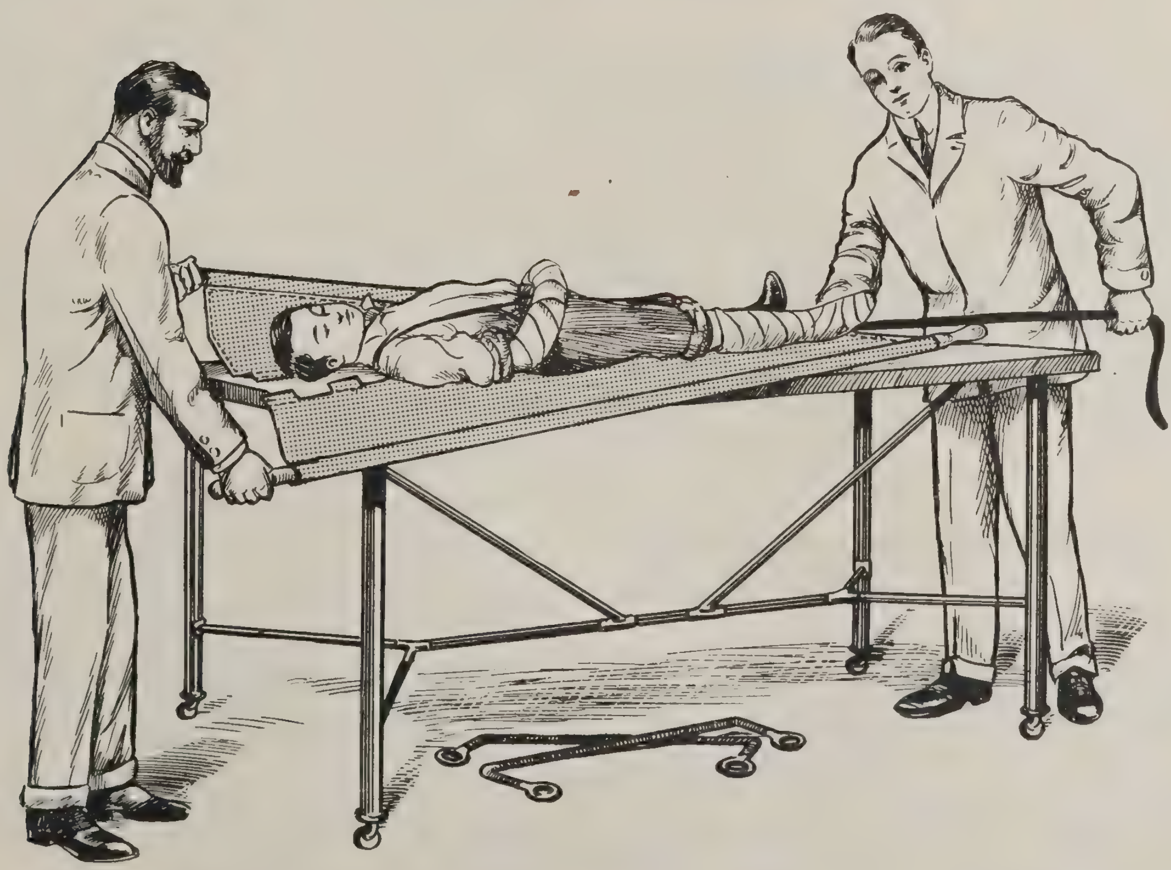


Illustration Showing the Williams' Improved Mine Stretcher in Actual Use.

PROVIDENT LIFE & CASUALTY CO.

CHARLESTON, W. VA.

Workmen's Compensation Troubles Minimized

To Corporations who accept the plan of Industrial, Accident and Health Insurance, offered by this company, much annoyance, and delay are saved.

Our company is mangaged by experienced coal men who know the problems of the operators and miners.

Read what some coal operators, and also miners who have had experience with our plan, have to say:—

FOUR STATES COAL & COKE CO.

Worthington, W. Va., June 18, 1914.

Provident Life & Casualty Co.
Charleston, West Virginia.

Dear Sir:—

It gives us a great deal of pleasure to commend your company to any one desiring to take up a first class insurance. The fact that a large number of our men are carried on your list—which is growing with each month—shows that our employees appreciate it. All claims have been satisfactorily adjusted with a very striking degree of promptness.

Yours respectfully,

FOUR STATES COAL & COKE CO.,
By B. H. Brown, Jr.

* * * * *

THE CONSOLIDATION COAL COMPANY

Jenkins, Letcher Co., Kentucky,

Provident Life & Casualty Company,
Charleston, West Virginia.

Gentlemen:—

During the period over which you have been writing business covering employees of The Consolidation Coal Company, I wish to congratulate you on the expeditious and thoroughly business-like manner in which you not only handle current business, but settle claims; in many instances advancing partial payment where necessary during convalescence of the insured party.

I wish especially to commend your representatives for the courteous treatment they have accorded our employees and their method of handling the routine business of your company, which has been without friction and with but few complaints, all such having been settled promptly and to the satisfaction of the insured.

A. W. KINZER, Local Auditor.

* * * * *

ELKHORN CONSOLIDATED COAL & COKE CO.

Hellier, Ky., June 30, 1914.

Provident Life & Casualty Co.,
Charleston, W. Va.

Gentlemen:—

Your service for the past two years, has been all that could be desired, both to the men insured and to our company, every claim having been adjusted promptly and to the dot.

Very truly,

LON RODGERS, Secy.-Treas.

KNICKERBOCKER MINES

Knickerbocker Coal
Knickerbocker Fuel Co.
Sole Agents
1 Broadway, New York

Somerset Mining Company
Knickerbocker Smokeless Coal Co.
Wilbur Coal Mining Company

Office of General Manager.
Hooversville, Pa., September 14th, 1914.

Provident Life & Casualty Co.,
Charleston, W. Va.

Gentlemen:

To whom it may concern:

It is with great pleasure that we give expression to our appreciation of the methods and worth of your company among our employees. You have been liberal and prompt in the payment of claims, and your agent, Mr. Binford, has been absolutely fair and courteous in all his dealings with us and our men. We gladly recommend both you and Mr. Binford to the consideration of any mining company that has not had experience with your insurance.

Very truly yours,

(Signed) TELFORD LEWIS, General Manager.

* * * * *

Caretta, W. Va., July 26, 1915

Provident Life & Casualty Co.,
Charleston, W. Va.

Gentlemen:—

I got shot on October 1st, 1914 by a gun going off accidentally. I thank you very much for paying my claim of $210.00, and wish to state that I was very glad I had a policy with you people.

I will gladly recommend your policy to any Laboring man.

Yours very truly,

(Signed) E. S. MULLINS.

* * * * *

Sylvia, West Va., July 14th, 1915.

Provident Life & Casualty Co.,
Charleston, West. Va.

Gentlemen:—

On August 25th, 1914 I suffered a severe injury while working in the mines in this section. I carried a policy in your Company and am today in receipt of full settlement of amount equal to $216.50.

I take this occasion to thank you for your fair dealings with me.

Yours truly,

(Signed) W. T. FOX.

* * * * *

Havaco, W. Va. Aug. 16th, 1915

Provident Life & Casualty Co.,
Charleston, West. Va.

Gentlemen:—

On July 14th, 1915, one of your Agents visited the Mines of the New River & Pocahontas Consolidated Coal Company, Havaco, West Virginia, where my husband, R. E. Fleming was working.

Through this Agent my husband was induced to take out a policy in your Company, and on July 23rd, 1915, was accidentally killed by fall of slate.

Claim covering death of my husband was filed promptly and a check for $100.00 received a few days thereafter.

Thanking you for your promptness and fairness in settling this claim, I beg to remain.

Very truly yours,

LIZZIE FLEMING.

FOR FURTHER REFERENCE AND DETAILS, WRITE TO THE COMPANY AT HOME OFFICE, CHARLESTON, W. VA.

KEYSTONE
THE.
MINING
CATALOG
COMBINED WITH
COAL FIELD
DIRECTORY
CONSOLIDATED PUBLISHING
COMPANY Inc.

MINE SUPPLY SECTION

Engineering Data

- Weights of Flat Iron.
- Weights of Square and Round Bars of Wrought Iron.
- Melting Points of Metals.
- Strength of Wrought Iron Bolts.
- U. S. Standard System of Bolts and Nuts.
- Horse-power transmitted by Leather Belts.

The following concerns have catalogue descriptions in this section:

Beck & Corbitt Iron Co.
Colonial Supply Co.
Duff Mfg. Co.
Frick & Lindsay Co.
Hoch Hame Co., Inc.
Humphrys', R. A. Sons.
Lawrenceville Bronze Co.
Pittsburgh Harness Supply Co.
Templeton, Kenly & Co., Ltd.
Tranter Mfg. Co.

For additional descriptions of Mine Supplies, not appearing in this section, refer to Index of Products in front of book.

BECK & CORBITT IRON COMPANY

First St., from Ashley to O'Fallon, St. Louis, Mo.

Iron and Steel

Mine, Blacksmith, and Machine Shop Supplies

Our large and well-assorted stock and splendid shipping facilities insure "Today Service" on

Bar Iron, Bar Steel, Angles, Norway Iron, Metal Roofing, Cold Rolled Shafting
Boiler Tubes, Black and Galvanized Sheets, Pipe, Fittings and Valves,
Rails, Track Spikes, Bolts, Nuts, Rivets, Washers, Prepared Roofing
and other Materials for Mine and Shop

We specialize on Tools, Machinery and Supplies for

Blacksmith and Machine Shops

Following is a Partial List of the Items We Handle:

- Anvil Tools
- Anvils
- Babbitt Metal
- Bands, Hose
- Bars, all kinds
- Beams
- Bellows
- Belting
- Benders, Rail
- Bends, Pipe
- Billets, Forging
- Blowers
- Boiler, Flanges,
  - Hangers and Lugs
  - Nozzles
  - Tubes
- Bolt Ends
- Bolts, all kinds
- Brushes
- Burrs, Riveting
- Bushings
- Calipers
- Cans, Oil and Waste
- Cap Screws
- Caps
- Car Movers
- Chain
- Channels
- Chisels
- Chucks
- Claw Bars
- Cleaners, Flue
- Clippers, Bolt
- Clips, Wire Rope
- Cloth, Wire
- Coach and Lag Screws
- Cocks
- Collars, Shafting
- Compounds
- Compressors, Air
- Coppers, Soldering
- Counter-Shafts
- Countersunks
- Couplings
- Covering, Pipe
- Crow Bars
- Crucibles
- Cutters
  - Pipe
  - Tube
  - Washer
- Cutting Off Tools
- Dies
- Discs
- Drills
- Drivers, Screw
- Engines
- Exhausters
- Files and Rasps
- Fire Extinguishers
- Fittings, all kinds
- Flanges, Forged Steel Boiler
- Floor Plates, Steel
- Flue Plugs
- Flues
- Forges
- Fusible Plugs
- Galvanized Angles
  - Ingot Iron Sheets
  - Sheets
- Glue, all kinds
- Graphite
- Grease Cups, Brass
- Grinders
- Hangers and Lugs
- Headers, Pipe
- Handles
- Hammers
- Hoists, Chain
- Holders, Tool
- Hooks
- Horse Shoes
- Horse Nails
- Hose
- I Beams
- I Beam Trolleys
- Ingot Iron,
- Iron, Bevel Edge
- Iron Bars, Rounds, Squares,
- Jack Screws
- Jacket Iron
- Jacks
- Joint Cement
- Joints
- Keys, Flat Spring
- Knives
- Lag Screws
- Lamps
- Lead
- Leathers, Pump
- Link Belt
- Links
- Locknuts
- Lubricators
- Malleable Iron Fittings
- Malleable Unions
- Manilla Rope
- Mauls, Spike
- Metal Lath
- Mule Shoes
- Nails
- Nozzles, Boiler
- Nuts
- Oilers
- Packing
- Pails, Galvanized
- Paint
- Paper
- Plates
- Power Hammers
- Pulley Blocks
- Pulleys
- Pumps
- Punches, all kinds
- Ratchets
- Reamers
- Reels, Hose
- Reinforcing Rods
- Rivets
- Rods
- Roofing and Siding
  - Galvanized
  - Black, Corrugated
  - Painted, V Crimped
- Saw Blades, Stone
- Saws, Friction
  - Hack
- Screen, Perforated
- Scrapers
- Scraping Tools
- Screw Plates for Bolts
- Shapes
- Sheet Brass
- Sheets, all kinds
- Shovel Handles
- Shovels
- Sledge Hammers
- Sleeves, Taper Shank
- Sockets, Drill
- Solder
- Spades
- Spikes
- Split Pulleys
- Sprocket Wheels
- Stocks, Pipe
- Strip Steel
- Stud Bolts
- Swedish Iron
- Tank and Sheet Iron Rivets
- Taps, Bolt
  - Machinist's Hand
- Machine Nut
- Tarpaulins
- Tee Rail
- Tents
- Tire Steel
- Tongs
- Tool Steel
- Tongs, Blacksmith's
- Trip Hammers
- Turnbuckles
- Twist Drills
- Unions, Malleable
  - Cast Iron
- Universal Rolled Plates
- Valves
- V Crimped Roofing
- Vanadium Steel
- Vises, all kinds
- Wagon Wood Stock
- Washers
- Wire, all kinds
- Wrenches

Meco Welding and Cutting Outfits

The ox-acetylene method of welding and cutting metals, repairing and strengthening parts of steel, iron, brass, copper, bronze and aluminum is the acknowledged standard method in use wherever welding is necessary. It has proven most valuable as a money saver, and will frequently repair in a few hours breakdowns that ordinarily require days to replace. Write us for information about "The Meco," the best, simplest and most efficient apparatus made.

SEND FOR OUR MONTHLY STOCK LIST

COLONIAL SUPPLY CO.

OFFICE AND SALES ROOMS

412, 414 First Avenue

Bell Phones, 1043-1044 Court. P. & A., 1870 Main.

PITTSBURGH, PA.

"Everything for the Mine"

Products

Anvils
Asbestos Goods
Augers
Automobile Supplies
Axes
Babbitt
Balata Belting
Barrows
Bars
Bellows
Bells
Belting
Benders
Bibbs
Bits—Mining Machine
Blacksmith Supplies
Blocks
Boiler Tubes
Boiler Trimmings
Boilers
Bolts
Brass Checks
Brass Goods
Brattice
Brooms
Brushes
Buckets
Builders' Supplies
Burners
Cables
Cans
Cars
Carts
Castings
Cement
Chain
Chemicals
Chalk
Checks—Brass
Chucks
Clamps
Clips
Clocks
Cocks
Coke Oven Supplies
Contracts Supplies
Copper
Cots
Drills
Duck
Dynamite
Electrical Supplies
Elevator Buckets
Emery
Emery Wheels
Emery Paper
Engines
Engineers' Supplies
Expanders
Extinguishers—Fire
Fans—Mine
Fans—Electric
Farriers' Tools
Fence
Files
Filters
Fire Alarms
Fittings
Flanges
Forgings
Forks
Foundry Supplies
Furnaces
Fuses
Gauges—All Kinds
Gas Supplies
Gaskets
Glass
Glue
Graphite
Greases
Grinders
Hack Saw Bladies
Hammers
Handles
Hanger—Pipe
Hanger—Shaft
Hardware—All Kinds
Hatchets
Headlights
Heaters
High Speed Tools
Hitchings
Hoists
Hose—All Kinds
Hydrants
Ice Tools
Indicators
Injectors
Inspirators
Instruments
Jacks—All Kinds
Knives
Lace Leather
Leather Belting
Leather—All Kinds
Ladders
Lamps
Lanterns
Lathes
Lead Pipe, etc.
Lineman Supplies
Lubricators
Lumber
Machinery
Manila Rope
Mattocks
Meters
Mine Supplies
Mine Tools
Motors
Nails
Natural Gas Supplies
Nipples
Nuts
Oil Well Supplies
Oilers
Oiling Devices
Oils
Packings—All Kinds
Pails
Paints
Paper
Picks, Clay, Coal
  and Puncher
Pipe and Tubing—
  All Kinds
Pliers
Plows
Plumbing Supplies
Pulleys
Pumps—All Kinds
Rags—Wiping
Rail Benders
Railroad Supplies
Ratchets
Rawhide
Reamers
Recording Cages
Rollers—Wood
Roofing—All Kinds
Rope—Manila
Rope—Wire
Rope—All Kinds
Rosin
Rubber Goods of
  All Kinds
Saws—All Kinds
Salamanders
Sand Driers
Screw Plates
Scraper Heads
Separators
Shafting
Shovels
Signals
Signs
Sisal
Sledges
Spikes
Smoothon
Stable Fittings
Steam Traps
Steel Goods
Shoes—Horse, all kinds,
  Mule
Stock and Dies
Stoves
Switches
Tackles
Tanks—All Kinds
Tapes
Taps
Tents
Thermometers
Tools—All Kinds
Torches
Track Tools
Transmission Goods
Trolleys
Trucks
Tubes
Tubing—All Kinds
Turnbuckles
Unions—Mark
Valves—All Kinds
Wagon Supplies
Washers
Waste All Kinds
Waste Cans
Wheelbarrows
Wheels
Whistles
Wire—All Kinds
Woodworkers' Tools
Wrenches—All Kinds

PIPING AND TUBING:

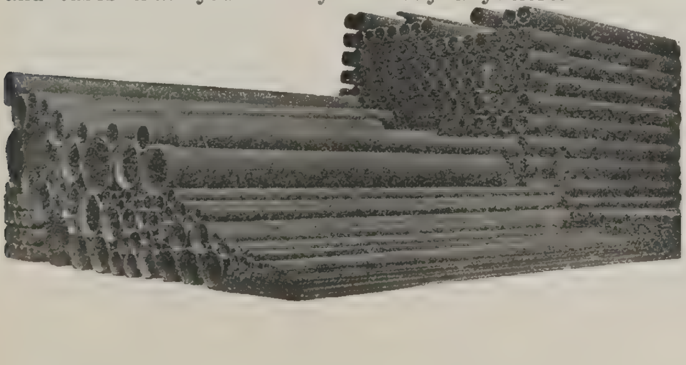
We are one of the largest distributors of Wrought Iron and Steel Pipe, Wrought Iron and Steel Tubing, Wrought Iron and Steel Line Pipe, Lap Welded Steel Boiler Tubes, Lap Welded Charcoal Boiler Tubes, Seamless Steel Boiler Tubes, Pure Copper Boiler Tube Ferrules (all sizes). Also mild open hearth, lap welded, "Perfect" Seamless Cold or Hot Drawn Steel Tubes, also Tyler Tubes. Any size or length of standard sizes or gauges. Special gauges or special bent tubes are furnished promptly.

CUTTING PIPE TO ORDER:

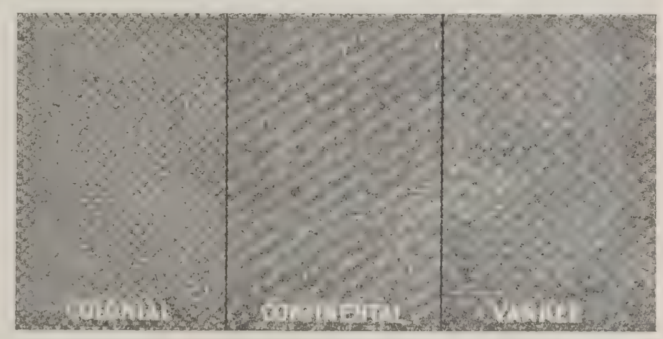
We have facilities for cutting and threading pipe (all sizes) to your blue print or sketch; are also prepared to install and erect piping.

ALWAYS READY
COLONIAL SERVICE:
WE SHIP FROM OUR OWN STOCK AT MILL DISCOUNTS.

There's all to gain and nothing to lose by sending us your orders. If you're not already acquainted with our service, get in touch with us, and let us prove to you that we can give you quicker delivery on better quality piping and tubes than your money will buy anywhere.



BRATTICE CLOTH.



Our "Colonial" Non - Inflammable Jute Duck Cloth, stronger than ordinary fabrics; the tight mesh of hard twisted yarns gives greatest durability. There is no better Brattice Cloth made.

Our "Continental" Non - Inflammable Brattice Cloth is a very close woven fabric, heavy, strong and durable, and when the yarns are swelled by mine dampness, this cloth is practically impervious to air.

Our "Yankee" Non - Inflammable Brattice Cloth is the lowest priced double-warped Jute Cloth. We never had a customer register a complaint against "Yankee" Brattice Cloth.

We keep the following widths in stock at all times:

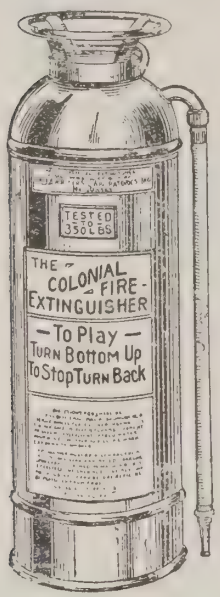
36 inch
42 inch
48 inch
60 inch
72 inch
84 inch
96 inch.

FIRE PREVENTION APPARATUS AND APPLIANCES OF ALL KINDS.

We have made a special study of devices and supplies for fire protection, and solicit correspondence on any equipment or outfits for large or small buildings, institutions, etc. Will be pleased to draft plans and specifications for installation. This service of our Experts is free.

Products

Fire Hose, Pyrene Extinguishers, Chemical Engines, Hydrants, Non-Explosive Gasoline Cans, Colonial Chemical Extinguishers, J-M Fire Extinguishers, Underwriters' Approved Devices of All Kinds, Watchman Clocks, Hose Racks, Hose Reels, Fire Plugs, Ladders, Fire Escapes.


TESTED TO 350 LBS
THE COLONIAL FIRE EXTINGUISHER
To Play Turn Bottom Up To Stop Turn Back

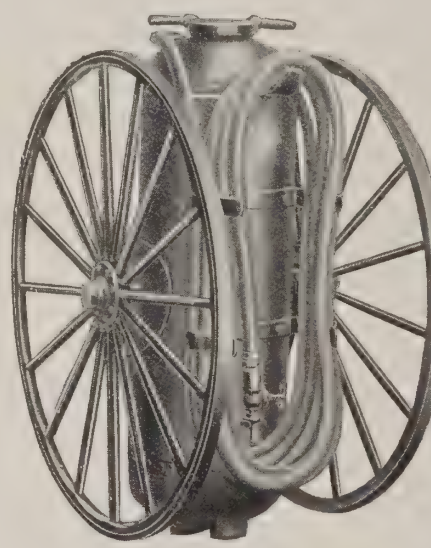
Colonial Fire Extinguisher

Tested by Underwriters' Laboratories (Inc.), under the direction of the National Board of Fire Underwriters. An extinguisher with so much worth and quality that we have no hesitancy in giving it our own name. Price, each......**$10.00**

PYRENE Extinguishers are filled, ready for use. Prices are f. o. b. New York City, or nearest shipping point.

Prices

Brass Extinguisher ...	$7.00
Nickel-Plated Extinguisher	8.00
Bracket, Enamel Finish	.50
Bracket, Brass Finish.	.75
Bracket, Nickel-Plated Finish	1.00
Liquid, per gallon.....	5.00



Number 27. Price, $185.00.

CAPACITY—40 gallons. Weight—380.
WIDTH—Over all, 23⅞ inches.
LENGTH—Over all, 49 inches.
HEIGHT—Over all, 52 inches.
GAUGE or TREAD—27 inches.

Sold 30 Days Free Trial.

Number [illegible], $75.00.
Capacity, 20 gallons.
Weight (empty), 135 lbs.
Weight (charged and ready for use), 300 lbs.
Width (over all), 22 inches.
Height (over all), 48 inches.
Is furnished with 25 feet special chemical hose with brass couplins and shut-off nozzle attached.

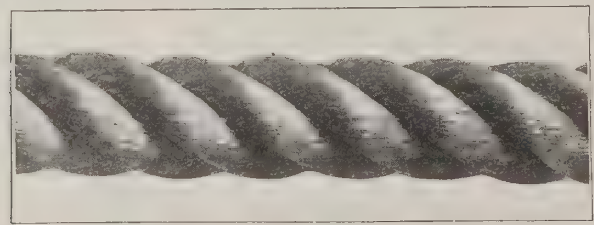
Sold 30 Days Free Trial

Colonial Manila Transmission Rope

The use of Rope for the Transmission of Power is increasing every day. The advantages claimed for it are:

1. Transmitting large amounts of power.
2. Runs in any direction.
3. Smooth and quiet running.
4. Absence of electrical disturbances.
5. Economy in first cost.
6. Economy in maintenance.
7. Accurate alignment of sheaves unnecessary.

Under the proper conditions, then, the question is not, "What kind of drive shall we use?" as much as it is, **"What kind of rope shall we use?"**

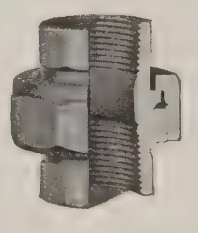


There are several makes of transmission rope on the market—all of different qualities and values, but naturally some **better** than others.

Before placing your orders we believe it is to **your interest** to learn the facts about **Colonial Manila Transmission Rope.**

For Ropes and Cordage of any kind get in touch with our **Cordage Department**; they can save you time and expense.

THE MARK COLD DRAWN STEEL UNION



The **Only** Union for **high pressure.**

The **Best** Union for all pressures.

It will expand and contract in exactly the same degree as wrought pipe with which it is used, and consequently it is not subject to leakage at threads which occurs in malleable and brass unions used in wrought pipe.

Octagon ends and nuts make the Mark Union easy to apply.

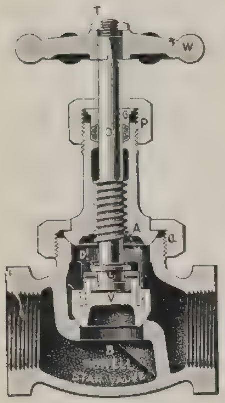
It is entirely free from blow holes and sand holes, defects common to all types of unions made of malleable iron and cast brass.

It has a densified hard steel seat, cushioned against a soft brass seat ring, which is welded in place—the brass being actually fused to the body metal,—no chance of seat ring working loose or of leaks under seat.

All surfaces, including threads, are rust-proofed.

The Mark Union will neither **Leak, Break** nor **Corrode.**

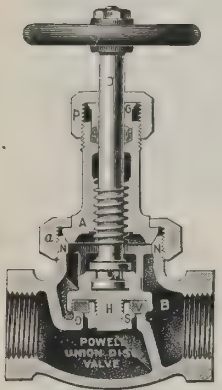
VALVES.



Model Star

Powell "Model Star" Valves.

For every Mining Demand, made in sizes $1/4''$ to $4''$ inclusive, screwed or flanged ends, medium and extra heavy patterns. Globe Angle, Cross and Check Valves. These valves are carried in stock.



Union Disc

Powell "Union" Composite.

Disc Valve is made along the same lines of our "Model" Star Valve. It has the "Union" Bonnet Connection, Swivel Disc Holder which will retain any make of Rubber Discs and will stand most severe test under any condition. These valves are carried in stock.

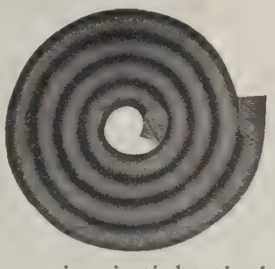
PACKING.

N. B. O. the original Black Sheet Packing.

The peer of all Rubber Sheet packing for withstanding the action of oil, acid, Alkali, Ammonia and steam, made plain or with wire cloth or asbestos insertion; also made in ring or gasket (Flat or Tubular) or moulded to design. **Weighs less per square yard than all other packing.**

Colonial Diagonal Packing:

A real packing for steam piston, ammonia and hot water pumps. Colonial Packing is made either in coil, spiral or ring form. Made for low and high pressures.



Regular — recommended for pressures to 100 pounds.

Special — recommended for pressures over 100 pounds.

All Colonial Packings put up in air-tight tin boxes. This thoroughly protects packing from atmospheric action, grit and other foreign matters.

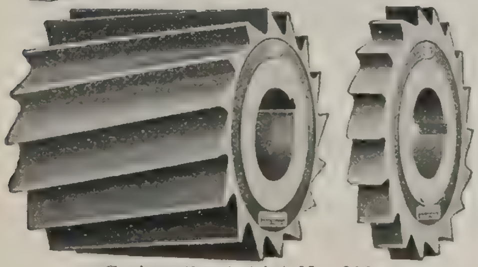
TRY COLONIAL RED SHEET (Guaranteed.)

We carry a full line comprising all styles of packing. When in the market for packing of any description, get in touch with our Packing Department. We will save you money.

Trade Mark

"Detroit" Tools are backed by the maker's rigid guarantee and we authorize you to return any which do not prove satisfactory.

Trade Mark



Carbon Steel, List No. 310.
High Speed Steel, List No. 310-A.

Detroit Twist Drills

are universally regarded as potential power savers — a quality developed through the adoption of an increased angle of twist.

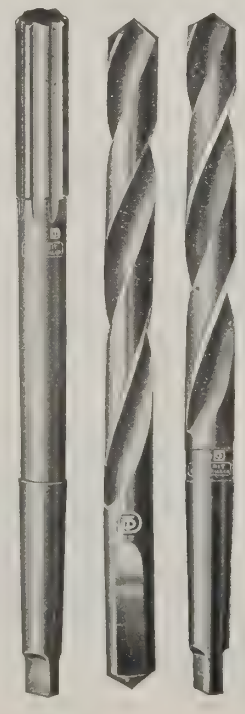
This increased twist, coupled with a special shape of flute, preserves the form of the chip until it has cleared the work. Friction losses are reduced, lubrication of the drill and work facilitated and the life of the drill extended.

Modern equipment, supplemented by 29 years' experience in the manufacture of twist drills, plus high-grade steel, intelligent workmanship, exact heat treatment and a scientific knowledge of drill technology, insure in Detroit Twist Drills unusual strength, accuracy, durability, and a high cutting efficiency.

"Detroit" Drills and Reamers are specified exclusively by many of the largest and the best manufacturers of automobiles in the country as well as by the largest Railroads and Mining Plants. Actual use proves that they cut the most metal with the least regrinding. Their use increases the working capacity of both men and machines.

"Detroit" Twist Drills and Reamers are made in all sizes and styles for every conceivable service—carbon and high-speed steel. We carry a complete line and fill rush orders on short notice. Get some on trial.

"A Hole at Half the Cost."



FRICK AND LINDSAY COMPANY

P. & A. Telephone 700 North
PITTSBURGH, PA.
Telephone 3180 Cedar

Mine Supplies and Specialtie

The Frick & Lindsay "Gray Book" —Catalog No. 10—

Being fresh from the press it has the overwhelming advantage of having list prices correct to date of publication making it an invaluable authority for checking purposes.

It is comprehensive in scope, without being confusing or cumbersome.

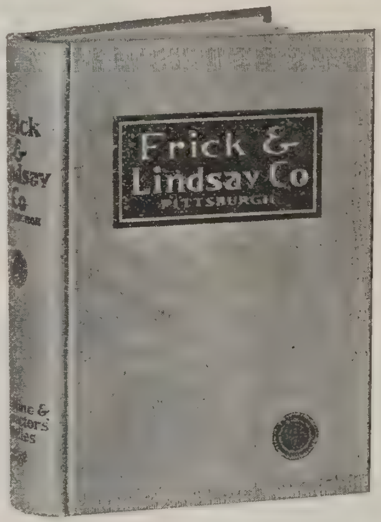
The illustrations are large, clear and attractive; and associated lines of supplies are arranged in such logical order as to make the use of the index almost unnecessary.

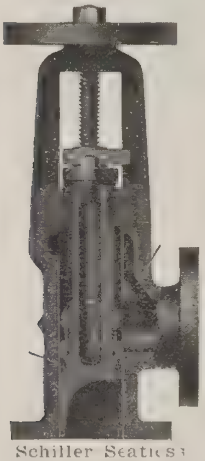
It contains much exclusive information and lists a highly successful line of invaluable, modern specialties, that can effect great economies.

The accompanying illustrations and brief comments have been selected to indicate the wide range and quality of specialties we handle, in addition to the usual line of supplies.

All are fully listed in Catalog No. 10, which will be furnished gratis to officials or departments whose activities are directly connected with the purchase or specification of supplies, on receipt of personally signed application, giving position occupied, provided the company is located in adjacent States and within favorable shipping distance of Pittsburgh, and has satisfactory commercial rating.

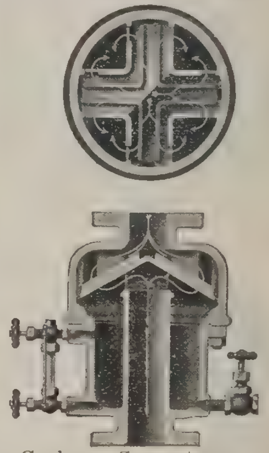
Owing to the heavy cost of production and limited number of copies remaining on hand, concerns located at a greater distance can be supplied only when application is accompanied by an initial order of reasonable proportions.



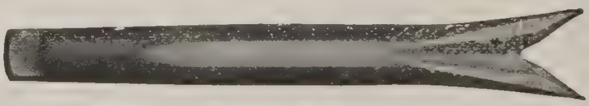


Schiller Seatless Balanced Blow-Off Valve. Guaranteed to end Blow-Off Troubles.

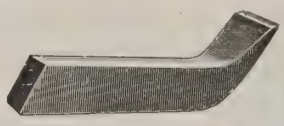
Babbitt Metal—An exclusive and highly successful specialty line. Two leading Brands at just prices; "Frick Economy" & "Superior."



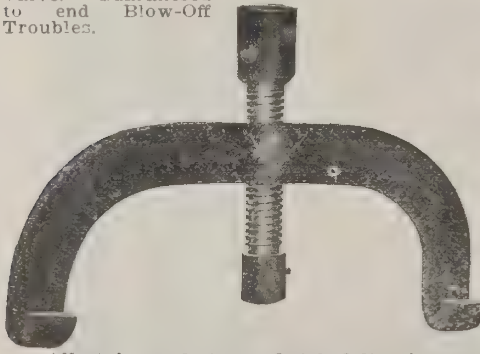
Cookson Seperators—Horizontal or Vertical—Moderate price—efficient. Also Cookson Steam Traps.



"Superior" and "Standard" Picks carried in stock.



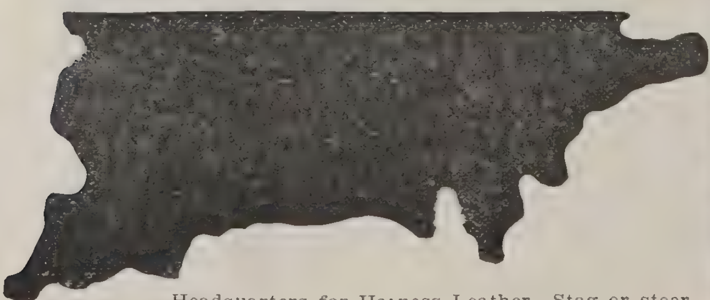
Machine Bits, Finished or Blank. All styles & grades. Prompt shipments.



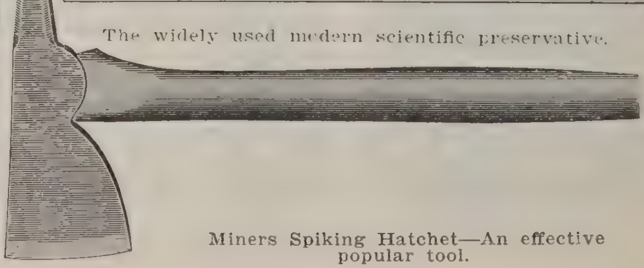
All styles and sizes. Quick deliveries.

Mine Car Hitchings. Regular and Bell-clevis.

The widely used modern scientific preservative.

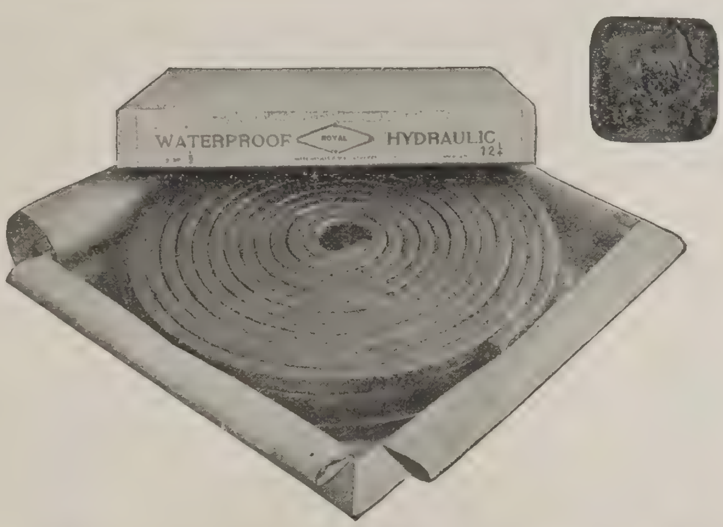


Headquarters for Harness Leather—Stag or steer.

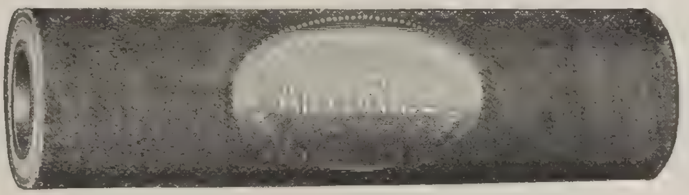


Miners Spiking Hatchet—An effective popular tool.

"Superior" Shovels. Nothing better on the market.



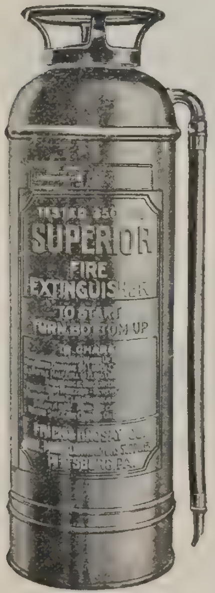
High Grade Packings for every kind of service. All the well known makes. Any samples duplicated.



Mining Machine Air Hose a specialty. "Superior' Steam Hose, the equal of anything made.

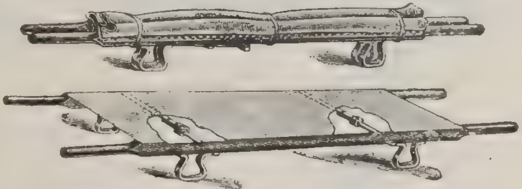
STAND ON END
SUPERIOR
The Best That Can Be Made
DURABLE · ECONOMICAL · FIRE RESISTING
ROOFING
USE NO HOOKS

Order "Superior" Roofing if you want to be absolutely certain.

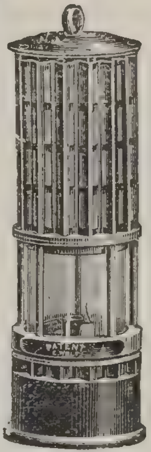


Canvas, Rubber, Balata and Leather Belting.

Genuine Short and Mason Anemometers. Miners Water Gauges, Etc.

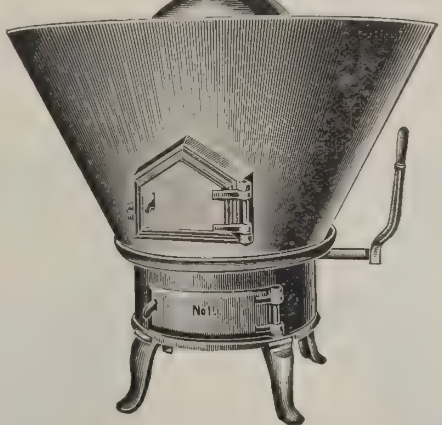


Mine Stretchers. Woolen and Rubber Blankets, First Aid Cabinets, Etc. Immediate delivery.

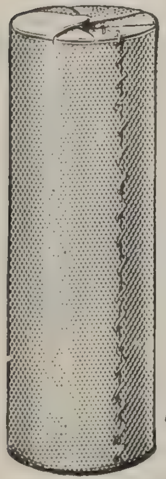


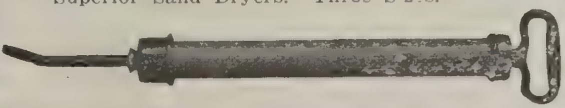
Wolf and Koehler Lamps.

The Famous Mine Rope.



Superior Sand Dryers. Three Sizes.





Brattice Cloth. Jute and Duck.

Improved Heavy Brass Mine Car Oiler or Grease Gun. Very powerful.

Kilbourne & Jacobs All-Steel and Wood-Frame Barrows.

TRANTER MANUFACTURING CO.

105 Water Street 104 First Avenue
PITTSBURGH, PA.

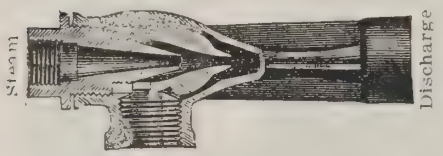
Machinists and Manufacturers

We have in stock and can furnish promptly the following:

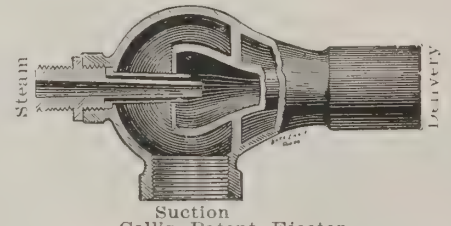
Air Compressors—"Tranter."
Air Tanks.
Boilers, Single Flue and Tubular.
Engines—Gas and Gasoline.
Engines—Steam.
Ejectors and Jet Pumps.
Pumps—Steam and Power.
Pumps—"Gould."
Pumping Machinery.
Centrifugal Pumps.
Hoisting Engines.
Electric Hoists.
Dynamos and Motors.
Storage Batteries.
Cold Rolled Steel Shafting.
Pulleys—(Iron, Wood and Steel).
Shaft Hangers.
Belting—Leather.
Belting—Rubber.
Belting—Canvas.
Pipe and Fittings.

OUR MACHINE SHOP

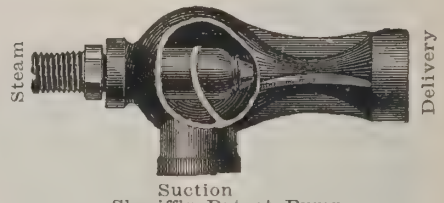
Covering 8000 square feet. Equipped with latest and most up-to-date Tools and Machinery, enables us to do all kinds of jobbing and repair work promptly and in first-class workmanlike manner.



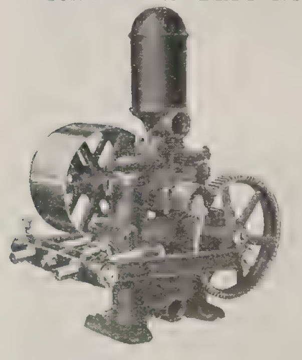
Coll's Patent "DEFIANCE" Pump



Coll's Patent Ejector



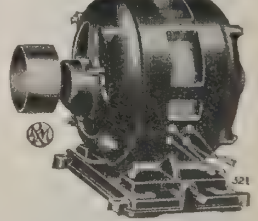
Sheriff's Patent Pump



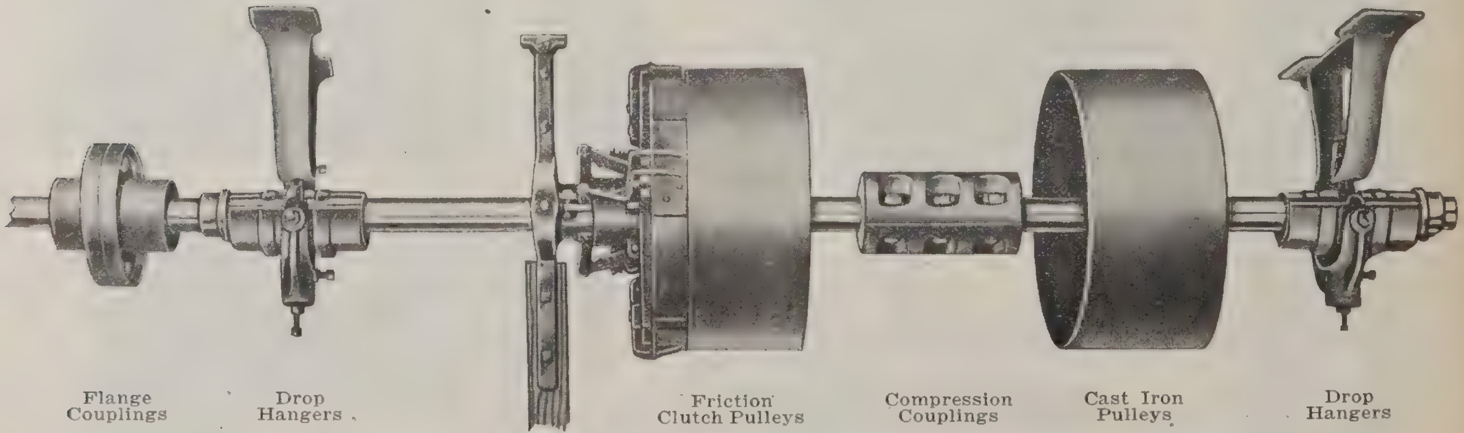
DEFIANCE JET PUMP is especially adapted for use in mines and deep wells where it is desired to elevate water or other liquids to high elevations. Warranted to **elevate water 75 feet** with 50 lbs. steam pressure, and by using two, one above the other, water can be elevated 100 feet—**non-freezing.**

COLL'S PATENT EJECTOR—Is especially adapted for use in Steamboats, Steamships, Locomotives, Mills, Mines, Factories, Tanneries, Breweries and Contractors. Will elevate water 35 feet. For pumping acids we make them of metal suitable for the purpose.

SHERIFF'S PATENT PUMP—Is extensively used in Salt Works, Breweries and Tanneries for handling brackish water, will elevate to a height not exceeding 35 feet, and is economical in the use of steam.



A FULL LINE OF TRANSMISSION MACHINERY CARRIED IN STOCK



SUBMIT US YOUR SPECIFICATIONS BEFORE PLACING YOUR ORDER

LAWRENCEVILLE BRONZE CO.

Established 1891

Thirty-first Street and Penn Avenue

Pittsburgh, Pa.

Manufacturers of

Brass, Bronze and Copper Castings
Anti Acid Metal Castings for All Purposes

Products

Brass and Bronze Repair Parts for Mining Machines, such as Gears, Bushings, Washers, etc.

Armature and Mine Locomotive Bearings.

Anti Acid Metal for pump rods, liners, valves, etc., for mine pumps.

Railroad Engine Brasses and Car Journal Bearings.

Rolling Mill and Machinery Brasses of all kinds.

Babbitt Metals—packed in 50 pound boxes.

Quick Coupling O. K. Unions—all sizes and for every purpose.

Larry Brasses for Coke Works.

Mine Car Bearings.

Anti Acid Metal for All Purposes

We make Pump Liners, Rods, Valves, in fact all metal parts exposed to acidulous water, from our own special formulas, which have given excellent and satisfactory service at a number of mines and steel mills where their water conditions are very bad. Our Acid Metal has the quality of being strong and tough in addition to its acid resisting properties.

Malleable Bronze Gears

Our cast gears are superior to all others for Mining Machines where coal dust is a factor in the wear and tear. These gears are cast so as to require no machine work on the teeth and the result is that the hard cast surface has greater resisting qualities against the action of grit, etc., than the finely finished surface of a cut gear.

These gears on your coal cutting machines mean service and economy.

Heavy Brass and Bronze Cocks

We manufacture heavy Brass and Bronze Cocks, 2, 3, and 4 way, for very severe conditions for use around coke ovens, and other places demanding this type of goods. These Cocks are made from our own special design, having a closed bottom, and have met with great success wherever used. We do not make these Cocks up for stock but each order is machined to suit your particular wants, so that the parts are interchangeable with whatever type you are now using.

Bronze Unions for All Purposes

We manufacture Unions of all kinds to meet various conditions. Our "O. K." Union is manufactured exclusively by us; is of the quarter turn type, specially adapted for use where quick connections are required.

Satisfaction Guaranteed

Our long experience has put us in a position to be able to make you castings from material suitable for the purpose intended. If you will but acquaint us with the conditions under which the castings are being used we will furnish you with castings that we will guarantee to give entire satisfaction.

Write, phone or wire us your inquiries and we will call on you and quote reasonable prices, and furnish the goods for which you have been looking.

THE DUFF MANUFACTURING CO.

Main Office and Works
PITTSBURGH, PA.

New York—50 Church Street.
Atlanta—Candler Building.
St. Paul—Merchants Bank Building
Chicago—Peoples Gas Building.
San Francisco—Monadnock Building.

Largest Jack Manufacturers in the World

Exclusive Manufacturers of

Genuine Barrett Jacks, Barrett Mine Jacks, Ball Bearing Screw Jacks,

Duff-Bethlehem Hydraulic Jacks and Screw and Timber Braces

Dufco Mine Jacks.

No. 223

Nos. 226 and 223 are especially popular for adjusting coal cutters. There are only three simple operating parts—the machine-cut steel rack, socket lever and retaining pawl. Jack may be lowered notch by notch when under load, or may be dropped instantly when free. There are no parts to rust out or to get clogged with fine rock, grit or dirt.

No.	Capacity Tons.	Height Inches.	Raise Inches.	Weight Lbs.	List Price.
226	2½	18½	10¾	31	$18.00
223	4	22	13	44	25.00

Barrett Automatic Lowering Jacks.

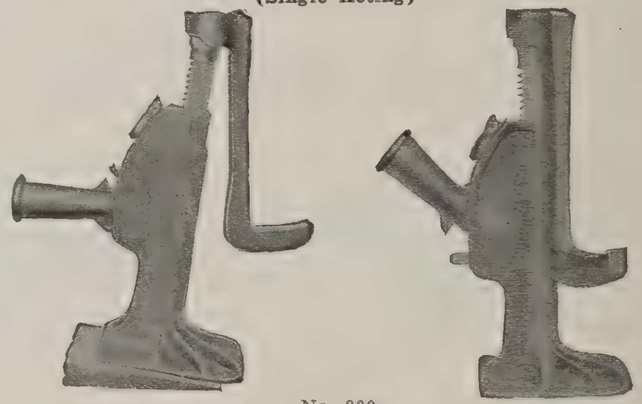
No. 2

For all around lifting purposes. These Jacks are double acting—raising the load on both upward and downward stroke of lever. They lower the load gradually. For simplicity, strength and quick, easy operation they have no equal.

No.	Capacity Tons.	Height Inches.	Raise Inches.	Weight Lbs.	List Price.
50	5	16	8	35	$16.00
51	5	21	13	42	18.00
2	10	21	10	73	25.00
3	12	26½	15	95	30.00
4	15	22	10	106	35.00
5	15	28	15	124	40.00

Barrett Emergency Car Jack.

(Single Acting)

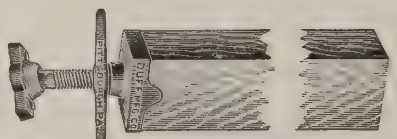


No. 239

The most powerful ratchet Jack made. Can be used in very small places. Forged steel claw swivels horizontally and vertically. Used as car and engine replacer.

No.	Capacity Tons.	Height Inches.	Raise Inches.	Weight Lbs.	List Price.
239	15	22	10½	97	$55.00

Timber Braces.


PITTSBURGH PA.
DUFF MFG. CO.

One of the Types of Timber Braces Used in Mine Shaft Work. Can Be Used Any Length from 2 to 30 Feet.

We do not furnish timbers.

Size of Screw.	Size of Cap or Washer Plate.	Weight Per Doz.	List Price Per Doz. Sets.	Tele. Code.	Butt End Caps Per Doz.
1½x14″	4x 4″	175 lbs.	$18.00	Tack	$ 3.00
1½x14″	6x 6″	192 lbs.	20.00	Tag	4.00
1½x18″	6x 6″	214 lbs.	22.00	Tank	4.00
2 x18″	6x 6″	384 lbs.	38.00	Tar	5.00
2 x18″	6x 8″	410 lbs.	40.00	Teak	7.00
2 x18″	10x10″	450 lbs.	42.00	Tenor	10.00
2 x18″	9x12″	444 lbs.	44.00	Tern	11.00

Send for Large Catalogue Illustrating Standard and Special Jacks.

TEMPLETON, KENLY AND CO., LT'D.

Established 1899

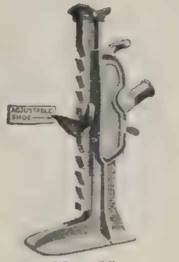
1020 South Central Ave. Chicago, Ills.

Sole Manufacturers of the
Simplex Mine and Industrial Jacks; Simplex Car, Track, Surfacing and Ballast Jacks; Simplex Emergency, Pole and Ordnance Jacks, and Simplex Auto and Truck Jacks.

The Gold Medal for Safety awarded Simplex Jacks by the American Museum of Safety, 1913.

Simplex Jacks are the only jacks that pivot on their base and that push and pull as well as lift and lower.

No. 50



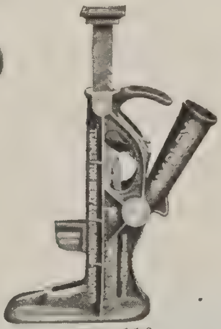
No. 55

No. 2

The Coal Industry has profited by their use. No matter where occasion arises for the use of a Jack—there's always a SIMPLEX that fulfills specifications to a detail and does the work quickly and easily.

No. 1

No. 19



No. 116

Drop Forged Steel and Brains have developed SIMPLEX JACKS to their present efficient state. Every working part is made of the highest grade of steel—and all parts are designed for the exact service for which they are intended. Guesswork is eliminated—a SIMPLEX is locked in every position and will never drop its load.

No. 25

If you have any particular problem involving the use of Jacks, no matter the service, whether track, shoring of walls, elevating or moving machinery, raising cars, etc., write for details of the SIMPLEX JACK you need.

There is a Simplex Jack for every purpose. Write for Catalog 216.

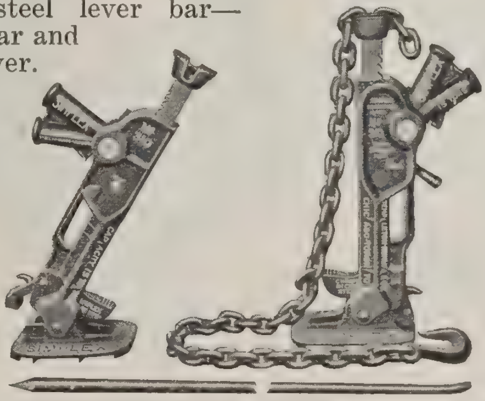
No. 310 Simplex Emergency Jack

Single Acting—Operating on the down stroke of the lever.

Capacity: 15 Tons; Lift, 12½ ins. Height 21½ ins.

Standard Equipment: 5′ Heavy chain with grab hook attached.

5′ steel lever bar—pinch bar and car mover.



A Boon to Coal Mines

Look at No. 310 SIMPLEX EMERGENCY JACK—one of the many "entirely different from old time design" type. It is one of three SIMPLEX JACKS that pivot on their base. And this feature is to be found only in SIMPLEX JACKS. It lifts, lowers, pushes, pulls. It is a crane and Jack combined. No. 310 will shore up timbers and walls, move heavy machinery, straighten up buildings, push heavy cars and a thousand other things. With its recessed chain cap and heavy drop forged steel construction, its double lever socket, and its "non-slip" caulked base, it is easily equal to its fifteen ton capacity with big overloads.

Every Coal Mine should use the No. 310 Simplex Emergency Jack.

THE HOCH HAME CO., INC.

General Office HAZLETON, PA. Works, FREELAND, PA.

Manufacturers of

The Original Hoch Patent Hame

PRODUCTS

We manufacture the original Patented Hoch Hames for mines, lumber camps and farm.

HOW ABOUT YOUR MULES, Mr. Manager?

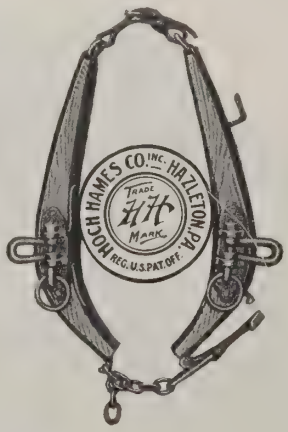
Are you making the work as easy for them as it is possible to make it? At the prices you are now compelled to pay for these animals it certainly behooves you to look after their comfort so you may be able to obtain the most efficient service possible. Knowing full well if they are working free and easy more can be accomplished and thus reduce the cost of production.

The Hoch Patent Mine and **Team Hames** insure all this, being high draft, perfectly balanced and **fitting** the collars **JUST RIGHT,** thus preventing sore shoulders.

They are made of the best quality fine grained oak and ash obtainable bent with the grain which adds to their strength, prevents them from becoming warped or bent and saves your collars from being ruined.

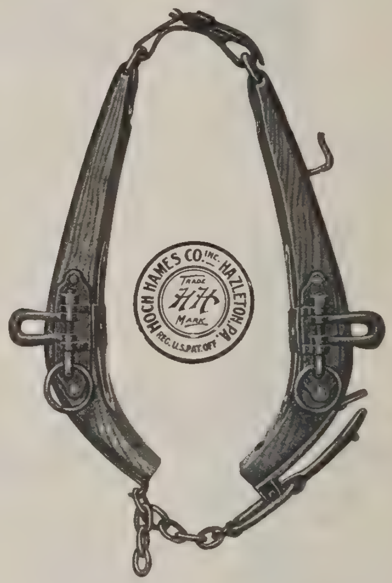
Have you counted the cost at your collieries from this common occurence, your hames break and you are delayed for five or ten minutes at your slope? **Our Patent Draft Attachment** and quick repair features prevent all these losses. Send for catalog or better still send us a trial order and in that way learn more about the time and money savers.

No. 1 and 448
Low Top


HOCH HAMES CO. INC. HAZLETON, PA.
TRADE HH MARK
REG. U.S. PAT. OFF.

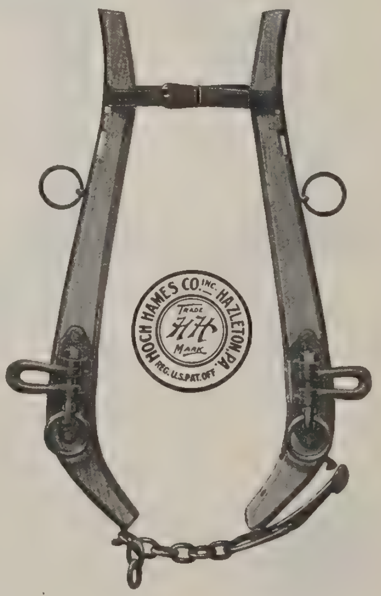
This low top Mine Hame shows the Hoch Lever partly opened, made of the Heavy Hoch Mine Pattern, Natural Root Wood, and Hoch's Patent Draft Attachment with Steel Trace Hooks, varnished, showing perfect grain of wood; made High or Low Tops; Sizes 13 inches to 24 inches.

No. G648
Low Top


HOCH HAMES CO. INC. HAZLETON, PA.
TRADE HH MARK
REG. U.S. PAT. OFF.

This Hame shows the Smith Lever partly opened, the extra Chain Hook Plate on the right hame, made of the Heavy Mine Pattern. Natural Root Wood, and Hoch's Patent Draft Attachment Steel Hooks varnished. Made High or Low Top. Sizes 13 inches to 24 inches.

No. 12487 High Top


HOCH HAMES CO. INC. HAZLETON, PA.
TRADE HH MARK
REG. U.S. PAT. OFF.

This Team Hame shows the Hoch Lever partly opened, made of the Natural Root Wood, with Hoch's Patent Draft Attachment with Steel Trace Hooks and Double Grooved at the top for hame strap, Bottom painted Black and the top a beautiful Vermilion or Varished, for heavy lumber work. Sizes 17 inches to 25 inches.

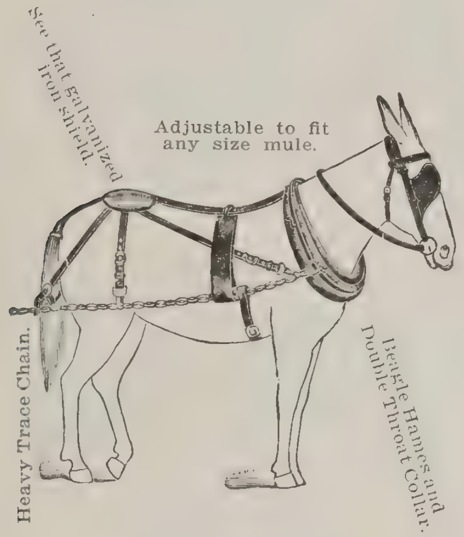
Catalog upon Request.

PITTSBURGH HARNESS SUPPLY CO.

325 PENN AVENUE, PITTSBURGH, PA.

Department 18. Bell Phone 2077 Court.

WE MANUFACTURE HARNESS AND STRAP WORK FOR EVERY PURPOSE.


See that galvanized iron shield.
Adjustable to fit any size mule.
Heavy Trace Chain.
Beagle Hames and Double Throat Collar.

This is the King of All Mine Collars
No. 1—Double Throat Mine Collar.

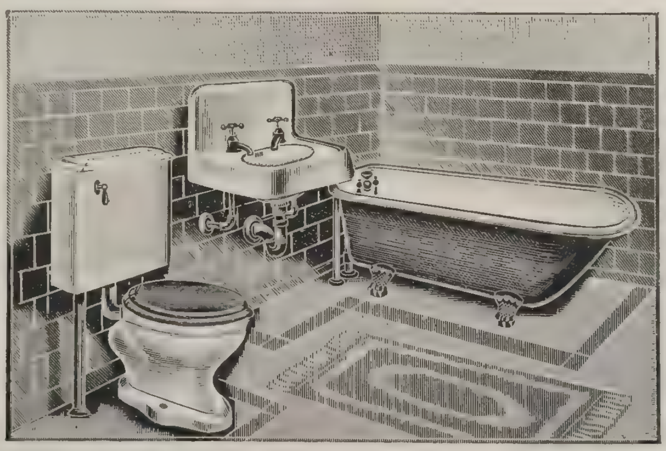
Over 1,000,000
Pairs in Use.

SEND FOR HARNESS CATALOG, SHOWING FULL LINE OF HARNESS SUPPLIES FOR THE HORSE, MULE OR STABLE.

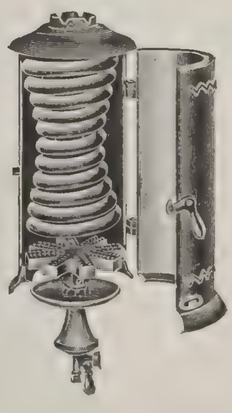
We sell all kinds of Plumbing Fixtures, including Bath Room Outfits, Shower Baths for your workshop, Toilets, Lavatories, Cast Iron Soil Pipe and Fittings.

Rubber Mine Cap.

Range Boilers.



Up-to-Date Bath Room Outfit.



Gas Water Heater.

Write for our Special Plumbing Goods **Catalog No. 18E22¾**, showing a full line of plumbing goods.

R. A. HUMPHRYS' SONS

1020-1030 Callowhill Street
PHILADELPHIA, PA.

Products

- AWNINGS
- BAGS: FEED
- BAGS: COAL & COKE
- BAGS: MAIL
- BAGS: TOOL, LINEMEN'S
- CANVAS: ROOFING
- CLOTHING: OILED
- CLOTHING: RUBBER
- COATS: RUBBER
- COATS: SHEEPSKIN LINED
- COVERS: AUTO
- COVERS: WAGON, CANVAS, ETC.
- DUCK: BLACK ENAMELED
- DUCK: PARAFINE
- DUCK: TARPAULIN
- FLAGS: (COTTON OR WOOL)
- FLAGS: RAILWAY SIGNAL
- SLICKERS (RIDING)
- STRIPES: AWNING & TENT
- TARPAULINS
- TENTS: MISC. DUCK, CANVAS, ETC.

Mail Bags or Merchandise

We manufacture Mail or Merchandise Bags in either Leather or Canvas. This should be of special interest to coal mining companies. Write us for prices.

Cotton Duck

We carry a complete line of Cotton Duck of all kinds, colors and weather-proof for all uses around a mine such as bratticing, etc.

WILLOW MILLS
EXTRA
COTTON DUCK
PHILA.

Oiled Clothing

We make the following brands of Oil Clothing, both black or yellow: "Girard Brand," "Spar Brand," "Cape Ann Brand." Oil Clothing is becoming generally used in coal mines and is the most serviceable garment to use, giving you complete comfort in damp and wet places, wears well and gives general satisfaction. We will be pleased to quote you prices on any of the above-mentioned brands.

CAPE ANN
GENUINE
ALWAYS READY
FINE WEAR
POPULAR GRADE
R.A.HUMPHRYS' SONS
PHILADELPHIA

Tents and Awnings

We have on hand Tents of all sizes for sale or rent for all purposes. We would also be pleased to receive your inquiries for Awnings for your stores, offices or homes.

KEYSTONE
THE MINING CATALOG
COMBINED WITH
COAL FIELD DIRECTORY
CONSOLIDATED PUBLISHING COMPANY INC.

MINERS' TOOLS & SUPPLY SECTION

The following manufacturers have catalogue descriptions in this section:

Allison Coupon Co.
Fulton Tool Co.
Hardsocg Mfg. Co.
Hardsocg, Martin, Co.
Leetonia Tool Co.
Nixon Mining Drill Co.
Rand-McNally & Co.
Southern Coupon Co.
Warwood Tool Co.

For additional descriptions of Miners' Tools and Supplies, not appearing in this section, refer to Index of Products in front of book.

THE MARTIN HARDSOCG CO.

PITTSBURGH, PA.

HARDSOCG MFG. CO.

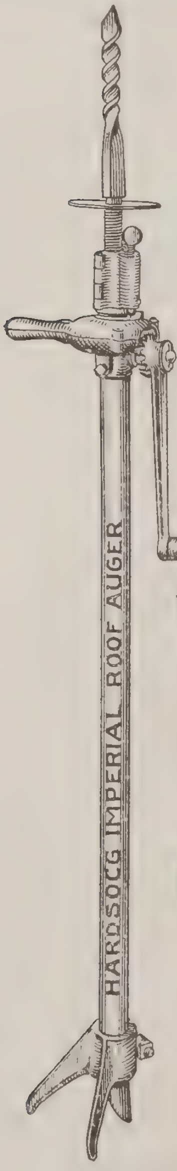
OTTUMWA, IOWA
Main Office and Works

Branch:
EVANSVILLE, IND.

Branch:
PITTSBURG, KANSAS.

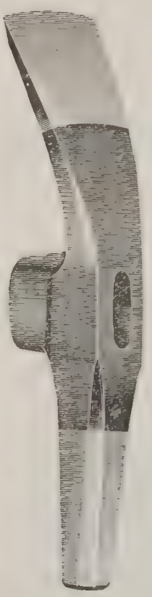
In addition to the items illustrated below, which are especially designed for the personal use of coal companies in their own work, and some of which are new to many mine managers, we make every tool used by the coal miner. We cater especially to quality, and with nearly 40 years experience should be able to serve you with intelligence. We can make any tool you need.

"Imperial" Automatic Feed Roof Auger, Patented.



This drill is especially designed for boring holes for insulator pegs.

It adjusts itself automatically to hard or soft drilling by means of our patent feed feature, having the effect of any thread from the coarsest for fast work to the finest for hard rock—**on the same thread bar.** Being adjustable in height with reversible thread bar and quite light it is strictly a **one man drill** and is absolutely guaranteed to do your work or **your money back.**



Hardsocg Track Adze

A new tool. Original with us.

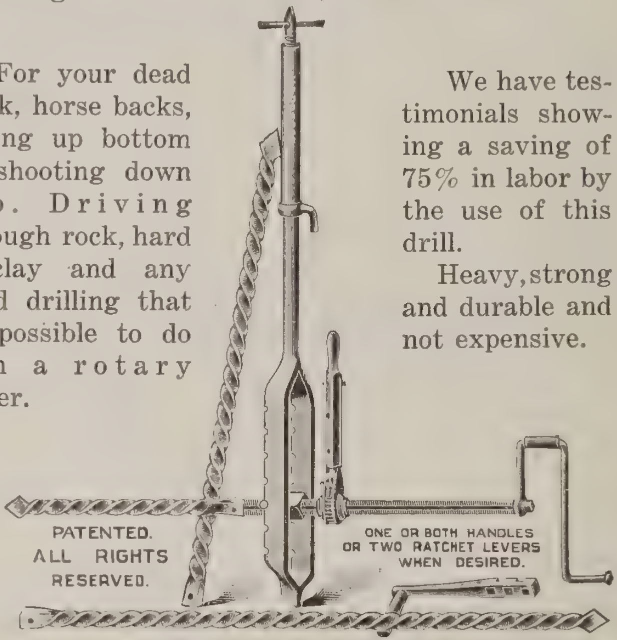
YOU NEED IT.

Hardsocg Rock Ratchet Drill, Eastern Pattern.

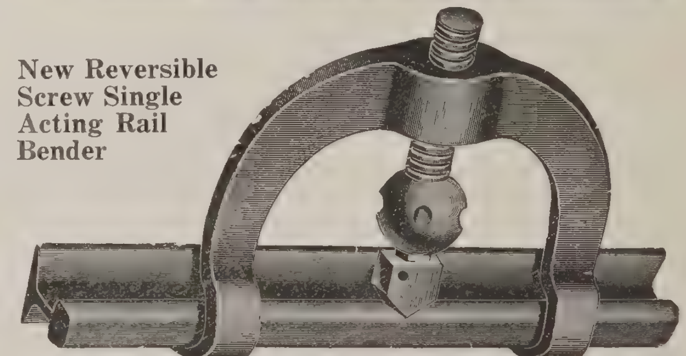
For your dead work, horse backs, taking up bottom or shooting down top. Driving through rock, hard fireclay and any hard drilling that is possible to do with a rotary auger.

We have testimonials showing a saving of 75% in labor by the use of this drill.

Heavy, strong and durable and not expensive.



New Reversible Screw Single Acting Rail Bender



Coke Pulleys, Lifting Jacks, Air Drills, "Atlas" Car Movers. Better prices on same quality. Better quality at same prices on "HARDSOCG" goods.

We make more Bits and Punchers of every pattern than any other concern in the world. Get Prices.

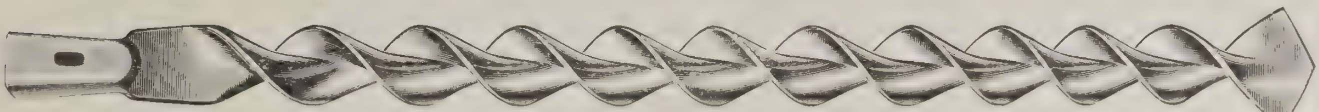
Costs Little

Saves Much Labor

This is Hardsocg's New "Imperial" Tracklayers Spike Bar. Note the special heel for driving under spike. It is a wonder.

HARDSOCG PRODUCTS---Continued

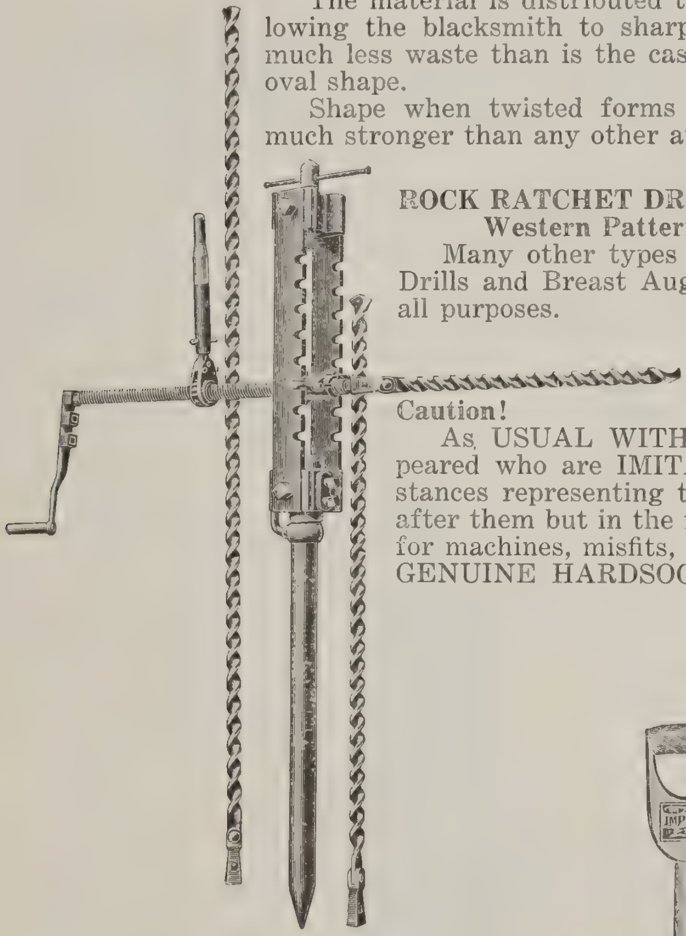
A NEW SHAPE AUGER



Look For the Name—HARDSOCG-PREMIER-PAT'D.—Rolled In the Steel.

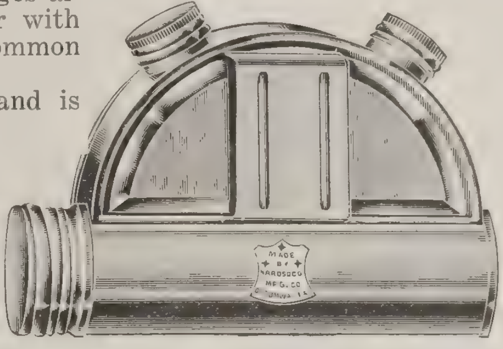
The material is distributed toward the edges allowing the blacksmith to sharpen the auger with much less waste than is the case with the common oval shape.

Shape when twisted forms a conveyor and is much stronger than any other auger.



ROCK RATCHET DRILL
Western Pattern

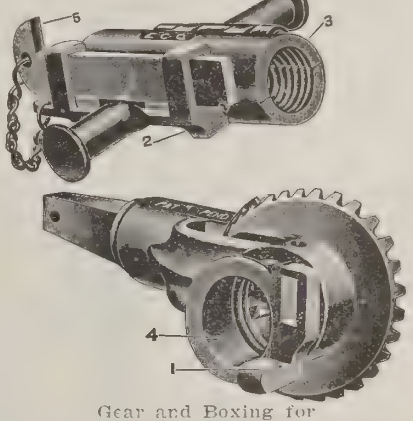
Many other types of Coal Drills and Breast Augers for all purposes.


MADE BY HARDSOCG MFG. CO.

Patent Compartment Canteen for Carbide, Water and Matches.

Caution!

As USUAL WITH ALL GOOD THINGS some PIRATES have appeared who are IMITATING HARDSOCG GOODS and are in some instances representing them to be HARDSOCG products. We are going after them but in the meantime if you want to save confusion in repairs for machines, misfits, and dissatisfaction of your customers generally, buy GENUINE HARDSOCG goods from the HARDSOCG FACTORIES.



Gear and Boxing for
OUR BEST COAL DRILL
E C "Q
Easy Cutting "Q"

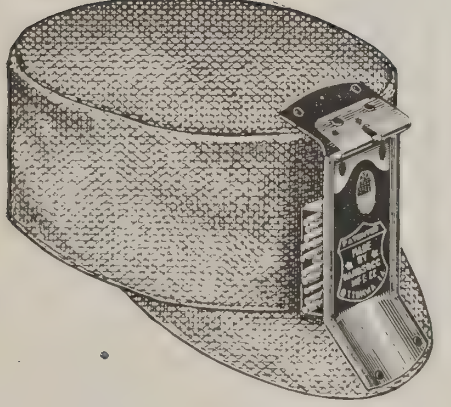
E C "Q" Coal Drill

Uses regular post (Post not shown).

Combines all the good features of our old "Q" Machine with several important improvements. Large Size Gear Wheel, no lost motion and Double Slot Thread Bar; make this the easiest running Coal Drill on the market.

Refering To the Above Cuts

1. Hook which engages lug on boxing.
2. Lug which fits into hook on gear frame.
3. Turned end of boxing which fits in recess in gear frame.
4. Recess in gear frame which receives end of boxing.
5. Key which locks boxing and gear together.



No. 5 Western Pattern

This is our No. 5 cap provided with a receptacle for matches. This receptacle is lined inside with cloth to prevent matches falling out. Matches are kept perfectly dry. A most convenient and attractive cap.

Hardsocg "Premier" and "Imperial" (Trade Mark Reg.) Brands. Finest polished shovel made.

THE FULTON TOOL COMPANY

Established 1882 New Location Re-organized 1916
HUNTINGTON, WEST VIRGINIA
Formerly at Canal Fulton, Ohio

Manufacturers of

THE **FULTON** LINE

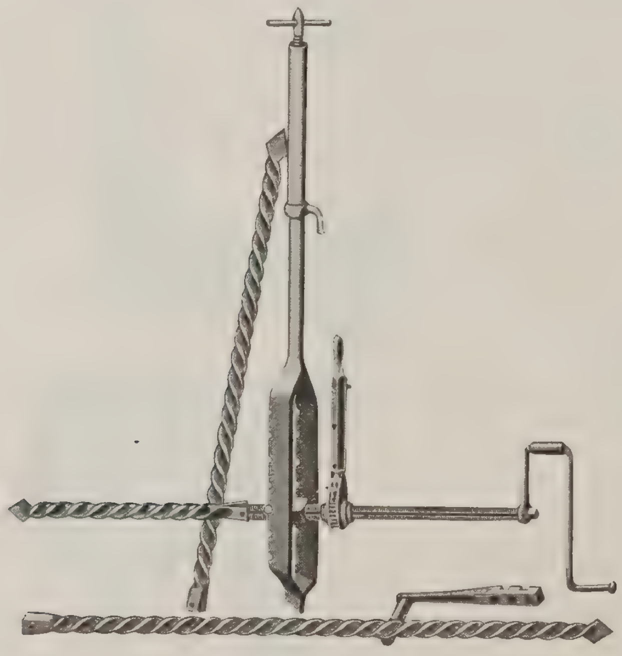
Coal and Rock Drills, Breast Augers, Coal Picks; Wedges, Copper Tools, Machine Bits, Bit Steel, Spike Bars

Announcement

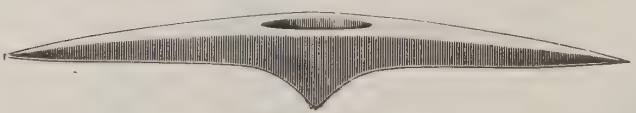
The Fulton Tool Works has been reorganized under the corporate name of "The Fulton Tool Company." For the present operation of the plant at Canal Fulton, Ohio, will be continued until we can complete the modern mining tool factory being erected at Huntington, W. Va., to which place we expect to remove about October 1st, 1916.

It is the intention of the management to greatly improve and increase the line of tools as formerly manufactured and we propose to furnish the trade the very best tools procurable making the name "FULTON" synonomous with Highest Quality.

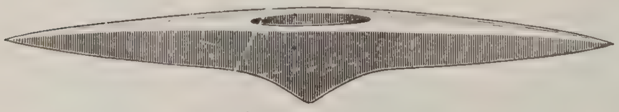
Your attention to the items illustrated below is especially invited as being worthy of your consideration when in the market. These are only a few of the many tools we manufacture:



Eastern Pattern Rock Drill.

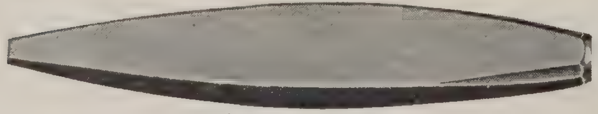


Mining Pick.

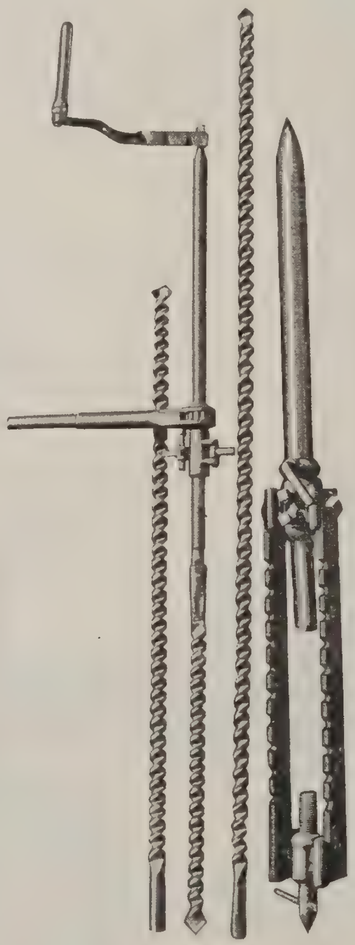


Cutting Pick.

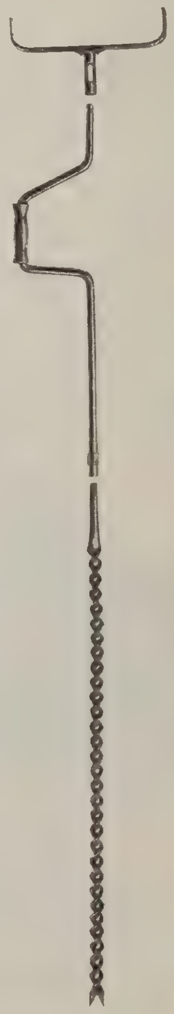
Eastern Pattern Wedge.



Western Pattern Wedge.



Western Pattern Rock Drill.



"FULCO." Breast Auger.

Bits and Bit Steel

Two qualities: **Crucible Grade and Special Analysis** "Fulton" Grade.

Sizes: ½" x ¾", ½" x ⅞" and ½" x 1".

THE LEETONIA TOOL COMPANY

LEETONIA, OHIO, U. S. A

THIS L.T.Co LEETONIA, O. ON TOOLS MEANS A GUARANTEE OF *Quality* TO DEALER AND USER.

Manufacturers of

HIGH GRADE TOOLS

Coal and Rock Drills, Specialties

Products

Hand-operated Coal, Rock and Plug Drills in Wood and Steel Post and Grip Bar types, Breast Augers, Coal Picks, Roadmen's Picks, Cleaner Picks, Garden Picks, Sledges, Wedges, Steel and Copper Needles, Steel and Copper Tipped Tamp Drills, Steel and Copper Tipped Combined Tampers and Scrapers, Cold Chisels, Carpenters' Wrecking Bars, Post Hole Digging Bars, Slate Bars, Pinch Bars, Jimmy Bars, Spike Bars, Machine Bits, Bit Steel, Track Gauges, Tie Holders, Roadmen's Hatchets, Trackmen's Adzes, Socket Wrenches, Set Screws, Rail Benders, Pipe Tongs, Shovels, Saws, Mine Harps, Trolley Wheels, Oil Lamps, Carbide Lamps, Caps, Complete Roadmen's Kits, etc.

Leetonia Tools are made from the best materials by skilled workmen. They are made, not with the object of having them interchange with other Tools that have been on the market for fifty years, but so as to enable the user to do more and better work with less effort. We are also prepared to make anything of a special character in our line.

Mr. Store Manager:

We know you want more customers, more profits. You are always figuring how to get them. Right here is where Leetonia Tools will help you just as they have others. Try them—you can't lose. We will take all the chances for we know that they will make good.

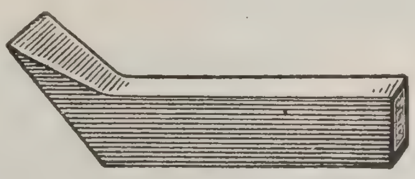
Mr. Mine Owner and Superintendent:

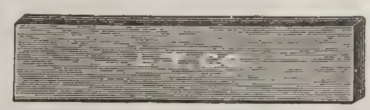
In these days of high wages and short hours you cannot afford to allow your day hands to work with poor Tools. Then, in fairness to yourself and us we ask you to carefully consider the many labor-saving tools which we manufacture. The prices we ask for them are so reasonable that you cannot afford to allow your blacksmith to make them.

Our Catalog illustrating and describing complete line of Tools and Supplies will be mailed upon request of Purchasing Agents, Mine Owners, Superintendents and Store Managers.

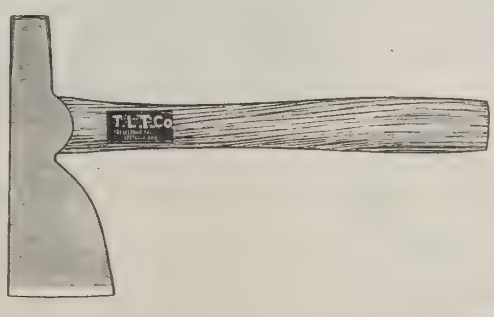
Chisel and Pick Point Bits

in sizes ½" x ¾", ½" x ⅞" and ½" x 1" in lengths of 4" or 4½". Our Bits will cut more tons of coal than any other Bits made. A broad statement, but we will be glad to prove it.



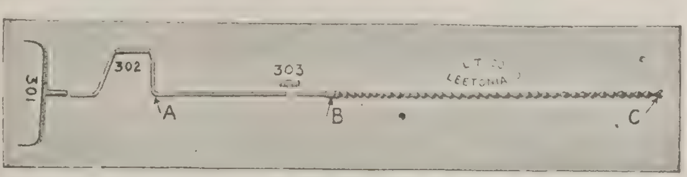


We have in stock for prompt shipment, the various sizes of Bit Steel, which we cut to any length. Our Steel is of special carbon. Prices reasonable. Trial order solicited.



We make more small Tools to be used by day hands than any other firm in America. There is a reason. We will gladly tell you why.

Where there is efficient management of coal or clay mines, there you will find Leetonia Tools.



We make Breast Augers in any size and length desired, either single or double crank.

NIXON MINING DRILL COMPANY

MANUFACTURES OF

Nixon Patent Rachet Mining Drills and Supports.

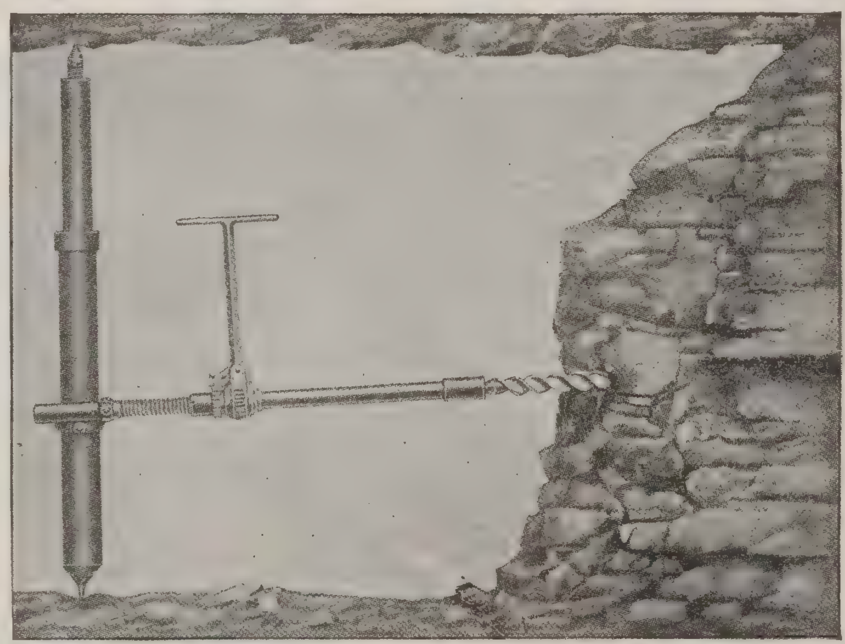
Office and Works--Chattanooga, Tenn

Products.

Manufacturers' Drills, Supports for Boring Coal, Iron Ore, Slate, Stone, etc.

Automatic Feed.

Automatic Feed, faster or slower, as material bored is soft or hard, ranging from 0 to 2½ turns per inch. Strong, simple, durable, economical — requiring but one man to operate, and works in any close place. Established in 1888. Favorably known in every mining camp in the United States and Mexico.



This illustration represents a Nixon Patent Rachet Mining Drill and Support set up in a Rock Entry.

Cheapness in Operation.

As a general proposition holes can be bored per foot, all costs considered, cheaper with **Nixon Ratchet Mining Drills** than with any other machine, hand or power. In mines already equipped with power it is frequently profitable to drive isolated or outlying entries or workings with **Nixon Drills.**

Special Features.

The **Nixon** has eight inches differential in set up of post, which no other drill has. All large mine supply houses handle **Nixon Ratchet Mining Drills** and supports. All **Nixon Drills** and parts are now branded with trade mark.

For Driving Entries.

Mining hard coal, iron ore, slate, etc., or taking top or bottom in coal or ore mines, it is the best drill in the world. Bores rock, slate and ore no other ratchet drill will bore. And any material that others will, the **Nixon Ratchet** bores faster and easier.

Get prices from dealers or commissary and accept nothing but the genuine **Nixon Drill.** Unscrupulous people are offering imitations made of inferior materials and workmanship.

For Boring Coal, Iron Ore, Slate, Stone, Etc.

Price of Drill only (either No. 1 or Patent Feed (P. F.)	$21.00
Support, under 5 feet	5.00
Set of Three Bits	5.00
One Drill complete	$31.00

Liberal discounts allowed purchasing agents and commissary storekeepers.

WARWOOD TOOL COMPANY

WHELING, W. VA.

Manufacturers of

Coal Miner's Tools

Products

We manufacture Coal Picks, Machine Twist-Bits, Coal Miners' Drills, Scrapers, Tamping Bars, Needles, Etc., Pinch and Lifting Bars, Spike Pullers, Crow Bars, Post Hole Diggers and Nail Pullers, Wedges, Sledges and Mattocks, Shovels, Bits and Picks.

The Warwood Tool Company was started sixty-two years ago to manufacture Coal Miner's Tools exclusively. Its variety of products has been broadened to include a great variety of tools for mining, railroad and construction work. The product is shipped all over the world.

In tools and material for coal mining we specialize on reliable, scientifically constructed grades.

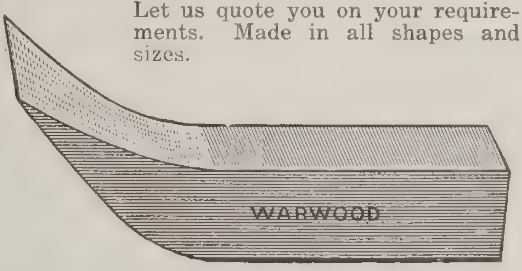
Warwood tools are cheaper in service, if first cost may be a trifle higher.

Unfinished Machine Bit Blanks

Warwood Special Bit Steel is standard in all the important workings. Best quality, Service guaranteed. Blanks cut any length desired, 4 inches long is usual, Carried in stock ¾ x ½″, ⅞ x ⅝″, 1 x ½″, and othes· sizes and shapes. Packed in 200 lb. kegs.

Machine Bits

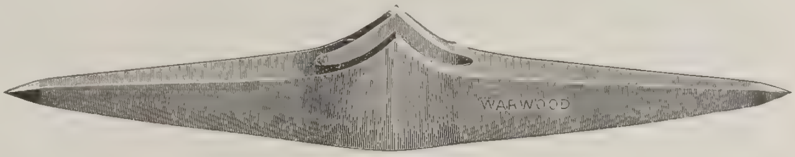
Made of high grade materials to meet exacting service. We guarantee Maximum wear. Let us quote you on your requirements. Made in all shapes and sizes.

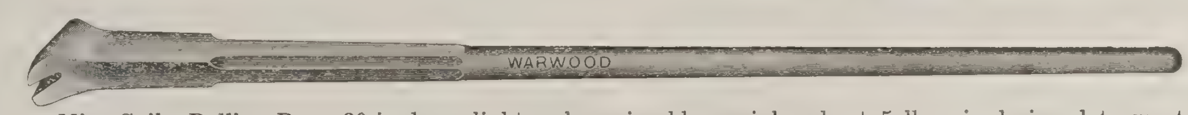


Warwood Coal Picks

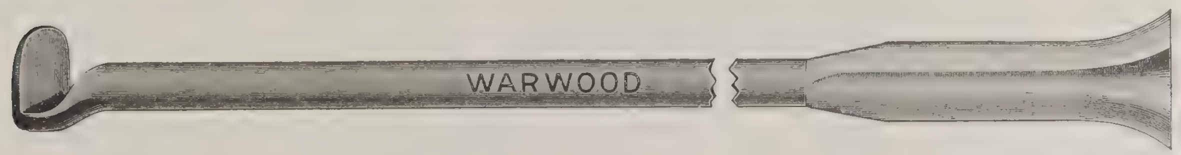
Warwood Brand Coal Picks are pointed with best grade Crucible Steel. Hammer forged by expert workmen. The highest type of Pick. Finished in baked Japan anti-rust finish.

Columbia Brand Coal Picks are solid steel. Superior to competing product of that grade. Hammer forged. Finished in baked anti-rust Japan.



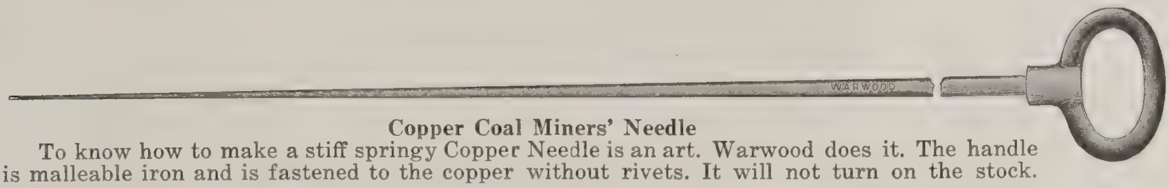


Mine Spike Pulling Bar. 30 in. long, light and serviceable; weighs about 5 lbs.; is designed to meet special mine conditions. It's a great puller. Note the well-proportioned Heel which gives it the lift necessary for quick work.



Copper Tamp Coal Miners' Tamper with Scraper

The Copper Tamper is made under our patented device, as is the drill. The copper in both tools is as hard and tough as it can be made and will give the longest possible wear.

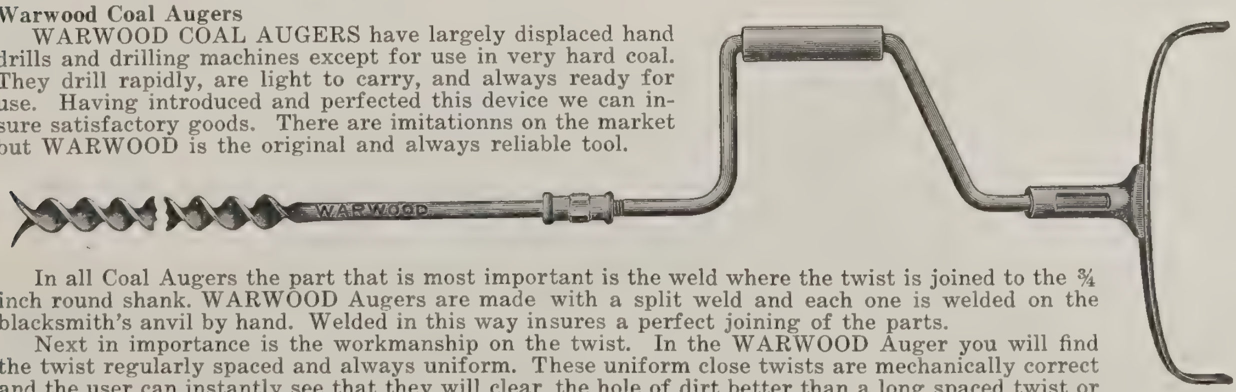


Copper Coal Miners' Needle

To know how to make a stiff springy Copper Needle is an art. Warwood does it. The handle is malleable iron and is fastened to the copper without rivets. It will not turn on the stock.

Warwood Coal Augers

WARWOOD COAL AUGERS have largely displaced hand drills and drilling machines except for use in very hard coal. They drill rapidly, are light to carry, and always ready for use. Having introduced and perfected this device we can insure satisfactory goods. There are imitationns on the market but WARWOOD is the original and always reliable tool.



In all Coal Augers the part that is most important is the weld where the twist is joined to the ¾ inch round shank. WARWOOD Augers are made with a split weld and each one is welded on the blacksmith's anvil by hand. Welded in this way insures a perfect joining of the parts.

Next in importance is the workmanship on the twist. In the WARWOOD Auger you will find the twist regularly spaced and always uniform. These uniform close twists are mechanically correct and the user can instantly see that they will clear the hole of dirt better than a long spaced twist or one irregular in spacing, one or two close and then several long spaces for the dirt to stop in.

ALLISON COUPON CO.

INDIANAPOLIS, IND.

Manufacturers of

Allison Coupon Books

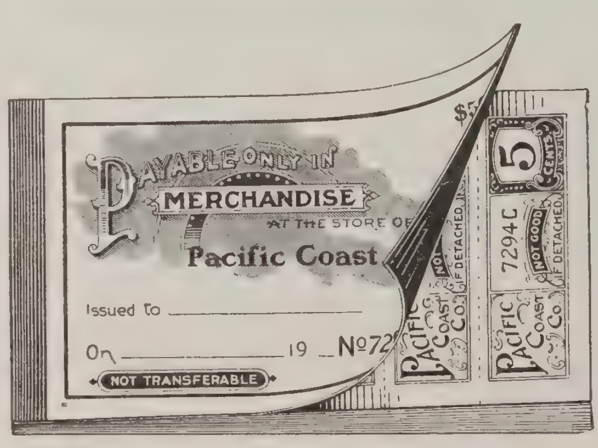
For Use In "Company" Stores, Dairies, Clubs, Ice Companies, Water Companies
Theatres, Garages, Laundries, Restaurants, Etc.

Product—

The Allison Coupon Books were thought out and manufactured especially to fill a requirement existing in the "Company Store," proposition.

There is probably no other place where the Coupon System is more necessary,—more nearly indispensable. It is, of course, possible for any company store,—even a large one—to go right along performing its functions without the Allison Coupon System, but no such store ever saved anything by so doing.

From time immemorial there has been an urgent need of some arbitrary medium of exchange for employees who must be supplied from the store on some sort of account against the next time-check. This is evidenced by the general use, until recently, of metal disks, tags, paper slips, punch-out cards, pass-books, etc., which make-shifts rapidly disappeared on the advent of the Allison Coupon System.



One of the most important features of their system is its simplicity. Where the former usages breed errors and misunderstandings, Allison Coupon Books insure accuracy. Where loss was prevalent, and naturally to be expected, these books brought safety. Where the forerunners of these books involved extra work and bother, this coupon system reduces bookkeeping to the minimum and eliminates every element of annoyance.

When an Allison Coupon Book is issued to the pay-roll employee, he signs for it on the form provided on the first leaf of the book, which the storekeeper tears out and retains for the time-keeper, who deducts the amount from the man's next time-check. One entry on the books, and the transaction is closed!

As the man requires goods from the store, he pays in coupons, just as he would pay in cash, and the coupons are kept and counted the same as cash, but aside from this they have no value, and if lost or stolen, are worth no more than waste paper to the finder.

The great plant where Allison Coupon Books are manufactured is devoted exclusively to this one task, and in every department is an astonishing model of efficiency. The Allison people have their own methods, perfected through long years of experience in supplying Coupon Books for most of the civilized world. Even the paper is made especially and the machinery built after their designs. They do no commercial printing—even sending out their printing such as stationery, catalogs, etc., to the commercial print shops.

So far have their efforts for accuracy been carried, that a mistake in count or numbering is impossible.

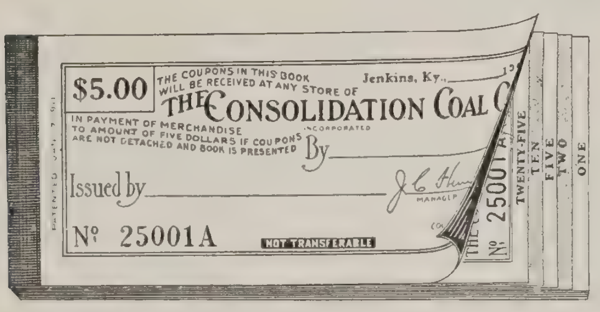
RAND McNALLY & COMPANY

CHICAGO NEW YORK

Manufacturers of

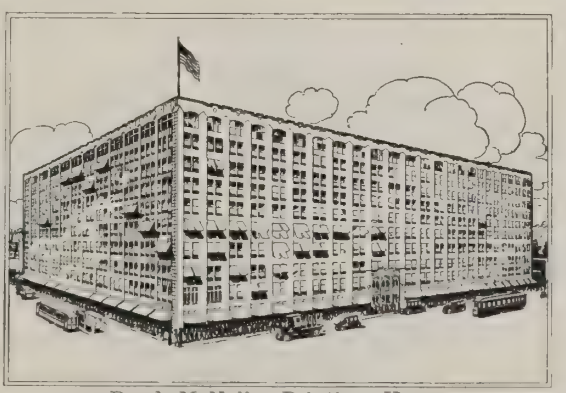
Patented Self-Indicating Coupon Books for Commissaries

The Coupon Book System of keeping store accounts with employees is becoming more and more general in the Coal Mining business. No other invention provides such a simple and perfect check upon small transactions, or so effectually stops the leaks possible where a separate charge is necessary for each purchase.


$5.00
THE COUPONS IN THIS BOOK WILL BE RECEIVED AT ANY STORE OF
Jenkins, Ky.,
THE CONSOLIDATION COAL C
INCORPORATED
IN PAYMENT OF MERCHANDISE TO AMOUNT OF FIVE DOLLARS IF COUPONS ARE NOT DETACHED AND BOOK IS PRESENTED
By
Issued by
MANAGER
Nº 25001A
NOT TRANSFERABLE
Nº 25001 A
TWENTY-FIVE
TEN
FIVE
TWO
ONE

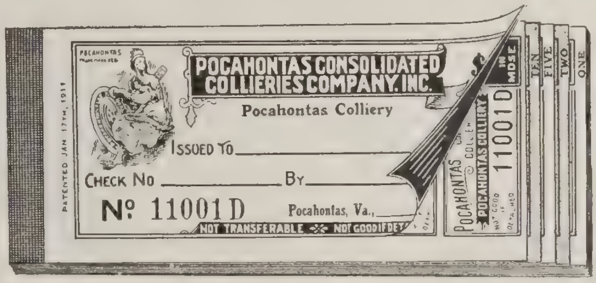
The Commissary Manager issues the book and takes a receipt which he turns over to the Paymaster with instructions to deduct the face value from the next pay check issued to the purchaser of the book.

The Coupon Books simplify the work of the book-keeper. Instead of an entry for each purchase, however small, the posting is reduced to one entry for each book issued. By this method there is practically no opportunity for dispute regarding an account, for the reason that when an employee presents his coupon book, he knows how many coupons are in it, he sees what are taken out in exchange for his purchase and still has his book for a more deliberate examination if he is so inclined.



Rand McNally Printing House
Clark & Harrison Sts., Chicago

There are various Coupon Books, but the Patented Self-Indicating Coupon Books excel because of their simplicty.



It will be noted, by consulting the above illustrations, that each denomination is indexed at the bottom of its page. This feature aids materially in the detachment of any denomination without the necessity of turning a number of pages. It is considered the very best Coupon Book on the market.

If you are using Coupon Books, are you entirely satisfied with the goods, the service, etc., you are now paying for? If not, we shall be very glad to have an opportunity of introducing the "Rand McNally Service."

We have special representatives, calling on the Coal Mining Commissaries at regular intervals, who are well acquainted with the merits of the Coupon System, and who can give any information desired in regard to installing this method. Prompt attention will be given to an inquiry in this direction.

Send for Samples and Prices.

SOUTHERN COUPON COMPANY

Office and Factory

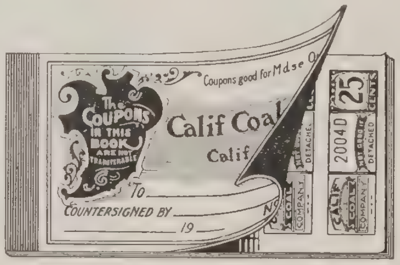
BIRMINGHAM, ALA.

Exclusive Manufacturers of **COUPON BOOKS** of Every Description

---

Products

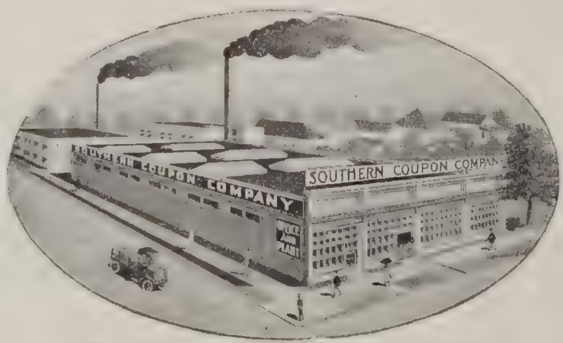
The Southern Coupon Company confines itself exclusively to the manufacture of Coupon Books of every description, such as Mercantile, Ice, Laundry, Meal, Dairy, Street Railway, Automobile Supply, Club, and many other books, and with its large, modern plant and complete, up-to-date, automatic equipment is in position to handle all orders promptly at minimum cost, and to guarantee absolute accuracy. Its product is printed in all modern languages and its market reaches the four corners of the world.



The coupon system has long since passed the experimental stage and has proved most effective in satisfactorily discharging obligations between the company and its employees. The Southern Coupon System reduces the complicated bookkeeping associated with the lose check and card "punch-outs" to a minimum, and, at the same time, eliminates much of the red tape connected therewith. It is a safe method for the company and a simple method for the employees. The Southern Coupon System makes bookkeeping unnecessary, the accounts being kept automatically, while it presents no intricacies to bewilder the employee in his transactions with the company.

Advantages of the Coupon System

Coupon books have many advantages but to the business man the saving of time and money affected by their use possibly appeal the most. The multitudinous petty transactions which involve exhaustive bookkeeping, creating possibilities for errors, which often cannot be traced, are taken care of by an automatic, self-regulating system, the simplicity of which protects the most careless employee from mistakes, and prevents disputes, because it can be grasped by the most ignorant patron.



Office and Plant of the Southern Coupon Co.

Perfect Checking Upon All Transactions

The Southern Coupon System provides a perfect check upon small cash or charge transactions and makes impossible the leaks and losses to which such transactions are susceptible in a more effective manner than can be accomplished by any other method. Until the coupon book is issued, properly countersigned, it is valueless and, even then, if lost or stolen, worthless.

Dishonesty or carelessness cannot creep in, as each book issued must be accounted for by cash, note or receipt covering its full value. At any moment, in a relatively short time, an audit may be made merely by comparing receipts for books issued with those on hand.

The coupons are worthless unless presented in the original book of which they form a part and the owner of the book is concerned only in obtaining the full exchange to which he is entitled when surrendering the coupons. There is no incentive to retain or lose coupons surrendered in this manner, as they are of no value either to the clerk who takes them or to any other person who may become possessed of them. The absence of coupons will affect the total sales for the day, therefore, particular care is taken to see that they go into the cash drawer or any other receptacle designed for the purpose. No actual loss is incurred even should the coupons be missing.

Further information, samples and prices cheerfully furnished to anyone interested, on application.

KEYSTONE
THE.
MINING
CATALOG
COMBINED WITH
COAL FIELD
DIRECTORY
CONSOLIDATED PUBLISHING
COMPANY INC.

DIRECTORY OF COAL MINES

The Following Pages Contain a Complete Directory of Coal Mines in the United States and Canada in Alphabetical Order Starting With Alabama

---

Keystone Consolidated Publishing Co., Inc.
PUBLISHERS
302 PENN AVENUE, PITTSBURGH, PA.

ABBREVIATIONS

PO——Post Office Address.
SP——Freight Station of Mine.
CTY——County.
RR——Name of Railroad.
PR——Name of President.
VP——Name of Vice President.
TR——Name of Treasurer.
GM——Name of General Manager.
PA——Name of Purchasing Agent.
GS——Name of General Superintendent.
EM——Name of Mining Engineer.
MS——Name of Mine Superintendent.
MF——Name of Mine Foreman.
CE——Name of Consulting Engineer.
EE——Name of Electrical Engineer.
MM——Name of Master Mechanic.
SM——Name of Manager of Store.
SCO——Name of Supply Co. or Store.
S of H—System of Hauling.
S of M—System of Mining.
PP——Power Plant Equipment.
EMP——Number of Men Employed.
CO——Number of Coke Ovens.

ALABAMA

For List of Abbreviations See Page 622.

AARON, M. COAL CO.
Cordova, Ala. No. report.

ABERNANT COAL CO.
Out of Business.

ALABAMA CO. (THE)
General Office, Birmingham, Ala.
PR—J. Williams Middendorf, Balt., Md.
TR—J. E. Whitney, " "
VP—H. W. Coffin, " "
VP—W. E. Leake, " "
PA—E. B. Heiser..Birmingham, Ala.
SM—E. B. Heiser, " "
EM—E. C. Morgan, " "
Sales Agent, J. W. Porter, " "

Brookwood Mine, Slope and Drifts; Brookwood, Milldale & Carter Seams; 32 to 46 in. thick; operate washery.
PO—Brookwood, Ala.; SP—Same; CTY Tuscaloosa; RR—L. & N.
MS—A. W. Reed....Brookwood, Ala.
SM—S. H. Williams, " "
S of H—Mules and rope, track gauge 36 in.
S of M—Hand.
PP—4 Water tube and 3 return tubular boilers, total 700 H. P., 2 air comp. and 3 pumps.
EMP—250. Coke ovens, 315 Bee Hive. Last fiscal year output, 89,399 tons.

Lewisburg, (Mary Lee) Mine, Slope; Mary Lee Seam; 5 to 6 ft. thick; operate washery.
PO—Lewisburg, Ala.; SP—Boyles, Ala.; CTY—Jefferson; RR—Mary Lee.
MS—J. C. Caldwell..Lewisburg, Ala.
SM—A. T. Hogan, " "
S of H—Mules and rope, track gauge 36 in.
S of M—Hand.
PP—3 Return tubular boilers total 400 H. P.; 2 pumps; purchase elec. power; gen. units, 220 volts A. C., 60 cycles.
EMP—230. Coke ovens, 350 Bee Hive. Last fiscal year output 257,902 tons.

Searles Mine; Drift, Brookwood and Milldale Seams, 72 to 84 in. thick; Operate Washery.
PO—Searles, Ala.; SP—Same; CTY—Tuscaloosa; RR—L. & N., Tuscaloosa Br.
MS—A. W. Reed........Searles, Ala.
S of H—Mules and rope; track gauge 36 in.
S of M—Hand.
PP—6 Water tube, 3return tubular boilers, total 900 H. P., 1 gen. unit, 7 pumps.
EMP—400 Coke ovens, 250 Bee Hive. Last fiscal year output, 186,129 tons.

ALABAMA COAL MINERAL & LUMBER CO.
General Office, Reading, Pa.
Ruby Mine, Slope, Marylee or Big Seam 28 to 64 in. thick.
PO—Cordova, Ala.; SP—Same; CTY—Walker; RR—Southern.
Note—In the hands of Receiver.

ALABAMA FUEL & IRON CO.
General Office, Birmingham, Ala.
PR—J. M. Overton..Nashville, Tenn.
TR—Overton Fullton, Birmingham, Ala.
GM—Chas. F. De Bardeleben,
PA—R. F. Culvahause..Birmingham, Ala.
EM—P. L. Dryer, " "
EE—Martin J. Lide, " "
GS—I. C. Delony, Margaret, Ala.
Sales Mgr. W. C. Adams, Birmingham, Ala.

Acton Mine, Slopes; Helena Seam; 5½ ft. thick.
PO—Acton, Ala.; SP—Same; CTY—Shelby; RR—L. & N., Helena Br.
MS—F. G. Long..........Acton, Ala.
SM—C. A. Jones, " "
S of H—Mules, track gauge 36 in.
S of M—Hand.
PP—1 pump.
EMP—211. Last fiscal year output 110,197 tons.

Acmar Mine, Slope; Henry Ellen Seam; 12 ft. thick.
PO—Acmar, Ala.; SP—Same; CTY—St. Clair; RR—Cent. of Georgia Ry., Henry Ellen Br
MS—W. J. Hand......Acmar, Ala.
SM—J. T. Upshaw, " "
S of H—Mules, track gauge 36 in.
S of M—Hand.
PP—1 pump; power from Central sta.
EMP—213. Last fiscal year output 366,298 tons.

Margaret Mine, Slope; Harkness Seam. 6 ft. thick; central washery. Output from all mines is washed.
PO—Margaret, Ala.; SP—Same; CTY—St. Clair; RR—Cent. of Georgia Ry., Henry Ellen B.
MS—Wm. Evans......Margaret, Ala.
SM—W. A. Walker.....Margaret, Ala.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—Central Station.
EMP—438. Last fiscal year output 318,843 tons.

ALABAMA SEMI CANNEL COAL CO.
Gas Light Mine; Drift; Corona Seam; 39 to 66 in. thick.
PO—Oakman, Ala.; SP—Same; CTY—Walker; RR—Southern.
TR—B. F. Corry........Oakman, Ala.
GM—B. F. Corry, " "
GS—B. F. Corry, " "
PA—B. F. Corry, " "
MS—B. F. Corry, " "
CE—Paul Haley,
S of H—Mules.
S of M—Hand.
EMP—12. Last fiscal year output 1,650 tons.
Note—Successors to Gas Light Coal & Coke Co. and Semi-Cannel Coal Co.

AMERICAN COAL CORPORATION.
General Office, Birmingham, Ala.
Burnwell Mine; Slope; Big Seam, 5½ ft. thick.
PO—Burnwell, Ala.; SP—Same. CTY—Walker. RR—Sou.
GM—H. E. Fleetwood, Birmingham, Ala
MF—T. M. Byram.......Burnwell, Ala.
S of M—Hand.
EMP—75. Last fiscal year output, 80,000 tons.

AMERICAN CO-OPERATIVE COAL MNG. CO.
Out of business.

AMERICAN MINING CO.
Jasper, Ala.
SUPT—Cain O'Rear.
No report.

ATLANTIC COAL & COKE CO.
Seloca Mine· Slope; Jefferson Seam, 32 to 42 in. thick.
PO—Warrior, Ala., R. F. D. No. 2; SP—Seloca, Ala.; CTY—Jefferson; RR—L. & N., Warrior br.
PR—W. K. Saulsbury..Warrior, Ala.
MS—W. K. Saulsbury, " "
TR—J. W. Ellis,.....Birmingham, Ala.
EM—A. H. Witt, " "
EE—John T. Walford, " "
SM—Jas. McClendon, " "
S of H—Mules and rope. Track gauge 36 in.
S of M—Hand.
PP—1 Return tubular boiler, 100 H. P., 220 volts A. C., 3 phase, 60 cycle.
EMP—75 Last fiscal year output 32,-120 tons.

BARNEY COAL CO.
Barney Mine, Slope; Big Seam; 3 to 7 ft. thick.
PO—Cordova, Ala.; SP—Same; CTY—Walker; RR—Southern
PR—T. N. Koehler....Chicago, Ill.
TR—M. G. Hubbard......Cordova, Ala.
GM—M. G. Hubbard, " "
PA—M. G. Hubbard, " "
MS—W. A. Spruoll, " "
SM—G. C. Lewis, " "
CE—C. A. Brown, Birmingham, Ala.
S of H—Mules and rope; track gauge 40 in.
S of M—Hand.
PP—2 Casey-Hedges return tubular boilers, total 180 H. P.
EMP—100. Last fiscal year output 80,000 tons.

BARTON BROS.
Lynn Mine; Drift, Black Creek Seam, 28 in. thick.
PO—Lynn, Ala.; SP—Same. CTY—Winston. RR—Sou.
Not—Mine closed down indefinitely.

BENOIT COAL MINING CO.
Benoit Mine; Drift; Mary Lee Seam; 32 to 48 in. thick. Operate washery.
PO—Benoit, Ala.; SP—Same; CTY—Walker; RR—Frisco.
PR—R. H. Palmer........Jasper, Ala.
TR—J. W. Ellis........Warrior, Ala.
GM—C. S. Bissell, " "
PA—Ollie L. Davis, " "
CE—Martin Lide, " "
MS—A. A. Herndon.......Benoit, Ala.
MM—Preston Pogue, " "
EE—Preston Pogue, " "
SCO—Benoit Coal Mining Co. Buyer,. J. F. Ensor, Benoit, Ala.
S of H—2 elec. locos. Track gauge 42 in.
S of M—2 Shortwall elec. mach.
PP—2 return tubular boilers, total 300 H. P., two 75 K. W. gen. units, 1 pump.
EMP—160. Last fiscal year output, 42-503 tons.
New Mine.

BESSEMER COAL, IRON & LAND CO.
General Office, Birmingham, Ala.
PR—H. L. Badham...Birmingham, Ala.
TR—H. L. Badham, " "
PA—H. L. Fickett....Belle Ellen, Ala.
EM—H. L. Fickett, " "
MS—C. N. Milam, " "
MM—E. J. Stovall, " "
EE—E. J. Stovall, " "
SM—J. H. Clifton, " "

No. 2 Mine; Slope; Youngblood Seam; 66 in. thick. Operate washery.
PO—Belle Ellen, Ala.; SP—Same; CTY Bibb; RR—L. & N. and Southern.
S of H—Mules and rope. Track gauge 36 in.
S of M—Hand.
PP—3 water tube boilers, total 900 H. P., 2 gen. units, 2300 volts A. C., 3 phase, 60 cycles, 1 pump.
Last fiscal year output 160,517 tons.

No. 7 Mine; Drift; Thompson Seam; 48 to 108 in. thick.
PO—Belle Ellen, Ala.; SP—Same; CTY—Bibb; RR—Sou. & L. & N.
S of H—Mules. Track gauge 42 in..
S of M—Hand.
Last fiscal year output 40,815 tons.

No. 8 Mine; Slope; Youngblood Seam; 60 in. thick. Operate washery.
PO—Belle Ellen, Ala.; SP—Morgan; CTY—Bibb; RR—L. & N. and Sou.
S of H—Mules.
S of M—Hand.
PP—1 pump.
EMP—60.

BIRMINGHAM FUEL CO.
General Office, 1033—1st Natl. Bank Bldg., Birmingham, Ala.
Townley Mine, Shaft, "Jagger" Seam, 54 to 66 in. thick; operate washery.
PO—Townley, Ala.; SP—Same; CTY—Walker; RR—Frisco.
PR—John R. Pill .....; Corona, Ala.
GM—John R. Pill, " "
TR—E. L. Adler....Birmingham, Ala.
PA—L. M. Adler, " "
MS—John B. Munfroy..Townley, Ala.
EM—P. S. Haley.........Corona, Ala.
MM—Jas. Blenkinsopp....Townley, Ala.
SCO—Birmingham Fuel Co. Store, Buyer, J. W. Porter, Corona, Ala.
S of H—Mules, track gauge 40 in.
S of M—17 Comp. air mach.
PP—4 Return tubular boilers total 600 H P., 3 air comp., 1 pump.
EMP—385. Last fiscal year output 153,-000 tons.
Sales Agent, B. R. Smith, Birmingham, Ala.

BIRMINGHAM WATER WORKS (THE)
General Office, Birmingham, Ala.
Birmingham Water Works Mines; Slope; Hackness Seam, 3 ft. 9 in. to 4½ ft. thick.
PO—Birmingham, Ala., R. D. No. 4; CTY—Jefferson.
PR—A. M. Lynn, 50 Broad St,. New York, N. Y.
TR—M. F. Riley, 50 Broad St., New York, N. Y.
GM—J. H. Purdy......Pittsburgh, Pa.
PA—H. H. Horner..Birmingham, Ala.
GS—H. H. Horner, " "
S of H—1 Steam loco. and mules; track gauge 32 in.
S of M—Hand.
PP—1 Return tubular boiler, 1 gen. unit, 1 pump.
EMP—16. Last fiscal year output 22750 tons.

BLACK CREEK COAL CO.
PR—J. B. Whitfield....Demopolis, Ala.
VP—T. L. Sharpe.......Nauvoo, Ala.
TR—T. L. Sharpe........Nauvoo, Ala.
GM—Wm. Cook, " "
MS—Wm. Cook, " "
PA—A. L. Hayley, " "
SM—A. L. Hayley, " "
EM—A. H. Witt.....Birmingham, Ala.

No. 1 Mine; Drift; Black Creek Seam; 30 to 40 in. thick; operate one washery.
PO—Nauvoo, Ala.; SP—Same; CTY—Walker; RR—Northern Ala.
S of H—Mules and 1 steam loco. Track gauge 40 in.
S of M—8 Comp. air mach. and hand.
PP—1 Columbus return tubular boiler. total 100 H. P., 1 air comp. and 2 pumps.
EMP—46. Last fiscal year output 24,-542.5 tons.

No. 2 Mine; Drift; Black Creek Seam; 24 to 30 ins. thick.
PO—Nauvoo, Ala.; SP—Same; CTY—Walker; RR—Northern Ala.
S of H—Mules and 1 steam loco. Track gauge 40 ins
S of M—4 comp. air mach.
PP—2 return tubular boilers; total 150 H. P., 1 air comp., 3 pumps.
EMP—25. Last fiscal year output 7,471.6 tons.
Sales agent, F. A. Grider, Birmingham, Ala.

BLACK DIAMOND COAL MINING CO.
General Office, Birmingham, Ala.
Castella Mine; Shaft; Jaggers Seams, 4 to 6½ ft. thick; operate washery.
PO—Townley, Ala.; SP—Same; CTY—Walker; RR—Frisco.
PR—C. S. Bissell....Birmingham, Ala.
GM—C. S. Bissell, " "
TR—H. E. Bissell, " "
PA—Ollie L. Davis, " "
CE—Martin Lide, " "
EM—W. L. Turner, " "
MS—A. A. Chamblee.....Townley, Ala.
MM—J. B. Keenam, " "
SM—G. H. Rush, " "
EE—Preston Pogue........Benoit, Ala.
Sales Agent, H. E. Bissell, Brimingham, Ala.
S of H—Rope and mules; track gauge 36 in.
S of M—8 Air mach.
PP—3 Return tubular boilers, total 375 H. P., 1 comp., 3 pumps.
EMP—140. Last fiscal year output, 54,908 tons.

BLAIR COAL CO.
Blair Mine; Drift; Goree Seam; 42 in. thick.
PO—Tuscaloosa, Ala.; SP—Same; CTY Tuscaloosa; RR—Warrior River.
PR—F. G. Blair....Tuscaloosa, Ala.
PA—F. G. Blair, " "
TR—C. M. Culpepper, " "
MS—C. J. Greer ....Holt, Ala.
SM—C. J. Greer, " "
EM—C. M. Ayres....Tuscaloosa, Ala.
S of H—Mules; track gauge 36 in.
S of M—Hand.
EMP—16. Last fiscal year output 10,000 tons.
Sales Agent, F. G. Blair, Tuscaloosa, Ala

BLOCTON CAHABA COAL CO.
Coleanor Mine; Slope; Thompson Seam 5 ft. thick. Operate washery.
PO—Coleanor, Ala.; SP—Same; CTY Bibb; RR—L. & N., Sou.
PR—J. R. Smith, Jr., Fayetteville, Tenn.
GS—Jas. Wilcox......Coleanor, Ala.
PA—Benj. E. Sherrod, " "
SM—Wm. Hopkins, " "
S of H—Mules.
S of M—Hand.
PP—7 Return tubular boilers, 3 pumps.
EMP—250.

BRILLIANT COAL CO.
General Office, Birmingham, Ala.
GM—David Roberts, Birmingham, Ala.
EM—Sumter Lea, Jr., " "
GS—E. W. Tarwater, Brilliant, Ala.
MM—D. Self, " "
Brilliant Mine; Slope and Drift; Black Creek Seam, 24 to 32 in. thick.
PO—Brilliant, Ala.; SP—Same; CTY—Marion; RR—I. C.
MS—E. W. Tarwater..Brilliant, Ala.
S of H—Mules and elec., track gauge 36 in.
S of M—Comp. air.
PP—3 Rust water tube, 2 Atlas return tubular boilers, total 600 H. P., 3 gen. units D. C.
EMP—125. Last fiscal year output 49,183.4 tons.

Calumet; Slope; Big Seam, 4 to 6 ft. 7 in. thick.
PO—Jasper, Ala.; SP—Calumet, Ala.; CTY—Walker; RR—Sou, N. A. Div.
MS—S. W. Jackson......Jasper, Ala.
S of H—Mules.
S of M—Hand and comp. air.
PP—1 Casey & Hedges return tubular boiler, 150 H.P.
EMP—45. Last fiscal year output 66,351.5 tons.

BROOKSIDE-PRATT MINING CO.
General Office, Birmingham, Ala.
PR—James Bonnyman, Birmingham, Ala.
GM—James Bonnyman, " "
PA—John Bonnyman, " "
TR—P. J. Garland, " "
MS—A. R. Long........Cardiff, Ala.
SM—W. M. Rodgers, " "
CE—H. A. Turner, Birmingham, Ala
EM—H. A. Turner, " "

(Continued on Next Page.)

Brookside-Pratt Mining Co.—Cont.
Pinckney City, Stockton, Cardiff and Brookside Mines, Drifts; Pratt and "Nickle Plate" Seams; 32 to 36 in. thick.
PO—Cardiff, Ala.; SP—Same; CTY—Jefferson; RR—Southern.
S of H—Mules, track gauge 36 in.
S of M—Hand.
EMP—200. Last fiscal year output 102,134 tons. Sales agent, Bonnyman-Norman, Birmingham, Ala.

Warrior River Mines, 1 Slope, 2 Drifts; Jagger Seam, 4 ft. 8 in. to 5½ ft. thick; operate washery.
PO—Carbon Hill, Ala.; SP Same; CTY—Walker; RR—Frisco, Main Line.
S of H—1 Comp. air loco. and mules; track gauge 36 in.
S of M—Hand.
PP—3 Return tubular boilers, total 1,250 H. P., 1 comp. 2 pumps delivering water to surface.

BRYAN COAL CORPORATION.
Red Star Mine, Drifts; "Big" Seam; 4 to 6 ft. thick.
PO—Red Star, Ala.; SP—Same; CTY—Walker; RR—Southern.
PR—Frank Nelson, Jr., Birmingham, Ala.
TR—Geo. Cole Scott, ..Richmond, Va.
MS—W. A. Upton....Red Star, Ala.
PA—N. R. Shockley, " "
EM—Theo. Nelson, " "
S of H—Rope.
S of M—Hand.
PP—4 Return tubular boilers, 2 pumps,
EMP—150. Last fiscal year output 93,332 tons.
Sales Agency, F. A. Grider, Birmingham, Ala.

BUTTAHATCHEE COAL CO.
Mary Etta Mine; Drift; Black Creek Seam, 28 to 36 in. thick.
PO—Delmar, Ala.; SP—Same; CTY—Winston; RR—Sou.
PR—Opie Gamble.......Delmar, Ala.
GM—Opie Gamble, " "
MS—Opie Gamble, " "
TR—W. A. Gamble, " "
PA—W. A. Gamble, " "
SM—W. A. Gamble, " "
EM—J. R. Smith, " "
S of H—Mules and rope, track gauge 36 in.
S of M—Hand.
EMP—17. Last fiscal year output 7500 tons.

BURNWELL COAL MINING CO.
Burnwell Mine; Slope; Big Seam 3 to 7 ft. thick.
PO—Burnwell Mines, Ala.; SP—Same; CTY—Walker; RR—Southern.
PR—Priestly Toulmin, Birmingham, Ala.
TR—S. L. Yerkes, " "
CE—H. A. Turner, " "
GM—H.E.Fleetwood, Burnwell Mines, Ala
PA—H. E. Fleetwood, " "
MS—T. M. Byram, " "
SM—M. L. Tubb, Burnwell Mines, Ala.
MM—J. J. Martin, " "
S of H—Mules and Rope; track gauge 36 in.
S of M—Hand.
PP—3 Return tubular boilers, total 310 H. P., 3 pumps.
EMP—105. Last fiscal year output 82,096 tons.
Sales Agent, F. A. Grider, Birmingham, Ala.

CAHABA CENTRAL COAL COMPANY.
Leland Slope Mine; Slope; Schute or Youngblood Seam; 2 to 4 ft. thick.
PO—West Blocton, Ala.; SP—Blocton, Ala.; CTY—Bibb. RR—A. G. S. Sou., L. & N., and M. & O.
PR—W. R. Young...West Blocton, Ala.
PA—W. R. Young, " "
TR—Geo. W. Randall, " "
MS—J. P. Rind, " "
EM—C. C. Huckabee, Birmingham, Ala.
S of H—Mules and rope, track gauge 39 in.
S of M—Hand.
PP—1 Water tube; 1 Air comp.; 1 pump.
EMP—40. New Mine.
Sales Agent. J. W. Lewis, 217 Woodward Bldg., Birmingham, Ala.
Note—Idle during past year.

CAHABA SOUTHERN COAL MINING CO.
Hargrove Mine; Slope; Underwood Seam; 66 in. thick.
PO—Hargrove, Ala.; SP—Same; CTY—Bibb; RR—Sou. L. & N.
PR—Daniel Pierson, Jr...Newark, N. J.
GM—Harold R. Sanson, Birmingham, Ala.
EM—A. H. Witt " "
MS—Frederick Dorricott, Hargrove, Ala.
S of H—Mules and rope; track gauge 42 in.
S of M—Hand.
PP—4 Return tubular boilers, total 500 H. P., I compressor.
EMP—150. Sales Agent, F. A. Grider, Birmingham, Ala.

CALEDONIA COAL CO.
Bankhead Mine; Shaft; Mary Lee Seam, 54 to 92 in. thick.
PO—Jasper, Ala.; SP—Bankhead, Ala.; CTY—Walker; RR—Northern Ala.
PR—J. H. Bankhead, Jr., Jasper, Ala.
TR—W. B. Bankhead, " "
GM—W D. Leake, " "
MS—J. S. Waldorp, " "
SM—C. S. Howard, " "
EM—A. H. Witt....Birmingham, Ala.
S of H—Mules, track gauge 40 in.
S of M—4 Comp. air mach. and hand.
PP—2 Return tubular boilers, 1 comp.
EMP—100. Last fiscal year output 91,581 tons.

CARBON HILL MINING CO.
Out of business.

CARDIFF MINING CO.
Riverside Mine; Drift; Nickelplate Seam, 30 to 36 in. thick.
PO—Cardiff, Ala.; SP—Same; CTY—Jefferson; RR—Sou.
PR—L. B. Pettiford, ...Cardiff, Ala.
TR—W. R. Pettiford, " "
GM—Chas. Hodge, " "
GS—Chas. Hodge, " "
S of H—Mules; track gauge 35 in.
S of M—Hand.
EMP—75. Output 150 tons per day.
Sales Agency, Bonnyman-Norman Coal Co.

CENTRAL COAL CO.
General Office, Kimberly, Ala.
Kimberly No. 2 Mine; Slope; Jefferson Seam, 34 in. thick.
PO—Kimberly, Ala.; SP—Same; CTY—Jefferson; RR—L. & N., Warrior branch.
Trustee—J. P. Pearson...Kimberly, Ala.
SM—P. A. Ellis, " "
S of H—Mules and 3 elec. locos. Track gauge 36 in.
S of M—1 elec. mach.
PP—220 volts A. C., and 250 volts D. C., purchase power.

CENTRAL IRON & COAL CO.
General Office, Holt, Ala.
Central Mine; Drift; Brokwood & Milldale Seam; 48 to 84 in. thick.
Operate washery.
PO—Kellerman, Ala.; SP—Same: CTY Tuscaloosa; RR—M.&O. and Southern.
PR—Waddill Catchings, New York, N.Y.
TR—de Courcey Cleveland, " "
GM—W. L. Klutz..........Holt, Ala.
PA—W. M. Joyner, " "
CE—H. S. Geismer..Birmingham, Ala.
MS—G. M. Powell....Kellerman, Ala.
EM—G. H. Howell, " "
MM—B. K. Perkins....Kellerman, Ala.
S of H Mules and 2 steam loco. Track gauge 44 in.
S of M—Hand.
PP—5 Water tubular Boilers, total 750 H. P., 2300 volts A. C., 3 phase, 60 cycles, 3 air comp., 7 pumps. Power purchased.
EMP—300. 161 Bee Hive coke ovens and 60 by product. Last fiscal year output 249,628 tons.

CHILDERS, S. J., & SON.
Childers Mine, Slope, "Coal City" Seam, 4 to 5 ft.
PO—Jasper, Ala.; SP—Same; CTY—Walker; RR—Frisco & Southern.
PR—S. J. Childers......Jasper, Ala.
GM—T. M. Childers, " "
MS—T. M. Childers, " "
SM—S. J. Childers, " "
S of H—Horses; track gauge 36 in.
S of M—Hand.
Last fiscal year output 1200 tons.

CHOBERT COAL CO.
West Corona Mine; Slope; Corona Seam, 30 to 36 ins. thick.
PO—Corona, Ala.; SP—Same; CTY—Walker; RR—Southern.
PR—C. P. Chobert........Corona, Ala.
GM—C. P. Chobert, " "
PA—C. P. Chobert, " "
MS—C. P. Chobert, " "
CE—P. S. Haley, " "
SCO—Chobert Merc. Co. Buyer, B. H. Richardson, Corona, Ala.
S of H—Mules, comp. air, and steam locos.
S of M—5 comp. air mach.
PP—2 boilers, 1 compressor, 5 pumps,
EMP—65. Output for 118 days, 21,586.7 tons.
Sales Agency, H. P. Gibson, Corona, Ala.
Operated under lease from the West Corona Coal Co.

CITY COAL CO.
PO—Jasper, Ala.; CTY—Walker.
No report.

CLIMAX COAL CO.
Climax Mine; Slope; Climax Seam, 2 ft. thick.
PO—Maylene, Ala.; SP—Same. CTY—Shelby; RR—Sou., Mobile div.
PR—G. F. Peter........Maylene, Ala.
GM—G. F. Peter, ... Maylene, Ala.
PA—G. F. Peter, " "
EM—G. L. Chamberlain, " "
MM—C. T. Little, " "
MS—J. S. Kellum, " "
SM—J. R. Hunter " "
S of H—Rope and mules. Track gauge 36 in.
S of M—6 comp. air mach.
PP—4 Brownell return tubular boilers, total 575 H. P., 1 air comp., 1 pump.
EMP—103. Last fiscal year output 27,288 tons.

COAL CITY MINING CORPORATION.
General Office 41 Broad street, New York, N. Y.
Coal Branch No. 3, Outcrop No. 2 and Glenn Nos. 1 and 2 Mines; Slopes; Coal City Seams, 36 to 96 ins. thick.
PO—Coal City, Ala.; SP—Same; CTY—St. Clair; RR—Seaboard Air Line, Pell City Br.
PR—F. T. Rubidge....New York, N. Y.
TR—E. O. Mann, " "
GM—O. F. Pattberg,
De Kalb Jct., N. Y.
GS—M. L. O'Neele......Coal City, Ala.
PA—M. L. O'Neele, " " "
EM—M. L. O'Neele " " "
SCO—Alveron & Moore, " " "
S of H—Mules and rope, track gauge 36 in.
S of M—Hand.
PP—6 return tubular boilers, total 440 H. P., 2 comp., 4 pumps.
EMP—95. Last fiscal year output 39,350 tons. 60 bee hive coke ovens. Sales agency, F. A. Grider, Birmingham, Ala., successors to the Seaboard Coal & Coke Company.

COMMERCIAL COAL MINING CO.
Mine worked out April, 1916.

CONNORS-WEYMAN COAL CO.
General Office, Birmingham, Ala.
Rolling Mill Mine, Slope, Helena Seam, 4 ft. thick.
PO—Helen, Ala.; SP—Same. CTY—Shelby. RR—L. & N.
MS—G. W. Postell......Helena, Ala.
S of M—Hand.
EMP—90. Last fiscal year output 48,100 tons.

CONSUMERS COAL & FUEL CO.
Out of business.

CORONA COAL & IRON CO.
General Office, Birmingham, Ala.
TR—E. L. Adler....Birmingham, Ala.
PA—L. M. Adler, " "
GM—John R. Pill.......Corona, Ala.
EM—P. S. Haley, " "
MM—C. M. Waldran.....Patton, Ala.
SM—J. W. Porter......Corona, Ala.
Sales Mgr., B. R. Smith, Birmingham, Ala.

Corona No. 3 Mine; Drift; Corona Seam; 36 to 52 in. thick; operate washery.
PO—Corona, Ala.; SP—Same; CTY—Walker; RR—Sou.
MS—P. S. Savage, ... Corona, Ala.
SM—W. D. Allison, " "
S of H—Mules and rope; track gauge 36 in.
S of M—6 Comp. air mach., hand.
PP—3 Return tubular boilers, total 300 H. P., 1 comp. and 5 pumps; Some air from Patton.
EMP—161. Last fiscal year output 104,092 tons.

Patton Mine; Drift; Corona Seam, 38 to 52 in. thick.
PO—Patton, Ala.; SP—Same; CTY—Walker; RR—Sou.
MS—J. K. Kirkwood....Patton, Ala.
SM—L. L. Allison, Patton, Ala.
S of H—2 Gasoline loco. and mules; track gauge 36 in.
S of M—16 Comp. air mach.
PP—6 Return tubular boilers total 990 H. P., 1 gen. unit 2,300 volts A.C., 3 phase 60 cycles, 2 comp. and 5 pumps.
EMP—246. Last fiscal year output 163586 tons.

Mary Emma Mine, Drift, "Corona" Seam, 42 in. thick.
PO—Coal Valley, Ala.; SP—Oakman, Ala.; CTY—Walker; RR—Southern.
MS—R. H. McLendon, Coal Valley, Ala.
S of H—Mules and 1 steam loco; track gauge 36 in.
S of M—Hand.
EMP—68. Last fiscal year output 47,274 tons.

Coal Valley Mine, Drift, "Corona" Seam 38 to 50 in. thick.
PO—Coal Valley, Ala.; SP—Oakman, Ala.; CTY—Walker; RR—Southern.
MS—John McKendrick, Coal Valley, Ala.
SM—R. H. McLendon, " "
S of H—Mules and 1 elec. loco.; track gauge 36 in.
S of M—9 Comp. air and 32 elec. mach.
PP—4 Return tubular boilers total 600 H.P., 1 gen. unit, 250 volts D.C. 1 air compressor, 3 pumps.
EMP—193. Last fiscal year output 105,791 tons.

Mine No 7, Drift, "Corona" Seam, 42 in., thick.
PO—Coal Valley, Ala.; SP—Oakman, Ala.; CTY—Walker; RR—Southern.
MS—J. M. Kirkwood, Coal Valley, Ala.
S of H—Mules; track gauge 36 in.
S of M—Hand.
Last fiscal year output 28791 tons.
Lockhart Mine abandoned.

DAVIS CREEK COAL & COKE CO
Rock Castle Mine, Slope; Jagger Seam, 6 ft. thick.
PO—Rock Castle, Ala.; SP—Same; CTY—Tuscaloosa; RR—L. & N.
PR—J. C. Maben....New York, N. Y.
TR—J. C. Maben, Jr, Birmingham, Ala.
GM—T. H. Tutwiler, Rock Castle, Ala.
SEC—T. H. Tutwiler, " " "
PA—T. H. Tutwiler, " " "
MS—Geo. Kuffner, " " "
SM—B. L. Bradley, " " "
MM—J. B. Ambrose, " " "
CE—A. H. Witt,...Birmingham, Ala.
EM—A. H. Witt, " "
S of H—Mules and rope, track gauge 36 in.
S of M—Hand.
PP—4 Boilers total 500 H. P., 1 air comp.; 4 pumps.
EMP—155. Last fiscal year output 84,142 tons.
Sales Agent, Bonnyman-Norman Coal Co., Birmingham, Ala.

DE BARDELEBEN COAL CO., INC.
General Office, Brown-Marx Bldg., Birmingham, Ala.
Sipsey Mine; Drift; Black Creek Seam; 30 to 40 in. thick. Operate Washery.
PO—Sipsey, Ala.; SP—Same; CTY—Walker; RR—St. Louis and San Francisco, Empire branch.
PR—H. T. De Bardeleben..Birmingham, Ala.
TR—H. T. De Bardeleben..Birmingham, Ala.
PA—G. W. Bowers..Birmingham, Ala.
GM—Milton H. Fi s......Sipsey, Ala.
PA—G. M. Bowers, " "
MS—J. W. Whatley, " "
EM—L. C. Harville, " "
EE—M. T. McGowan, " "
MM—M. T. McGowan, " "
SM—A. J. McDanal, " "
CE—Martin J. Lide, Birmingham, Ala.
S of H—6 elec. loco.; track gauge 42 in.
S of M—11 elec. mach.
PP—3 return tubular boilers, total 450 H. P., 2 gen. units, 280 volts D. C.
EMP—600. Last fiscal year output 279,985 tons.
Successors to the Maryland Coal & Coke Company.

DE SOTO COAL MINING & DEVELOPMENT CO.
See Majestic Coal Co.

DIAMOND COAL CO.
Oak Leaf Mine; Drift; Big or Prat Seam; 30 to 36 in. thick.
PO—Cordova, Ala; SP—Same; CTY—Walker; RR—Frisco.
PR—J. S. Shannan.....Cordova, Ala.
PA—W. H. Walker & Co., " "
MS—Geo. Cavanist, " "
CE—W. L. Turner, " "
EM—W. L. Turner, " "
SM—M. L. Chapman, " "
S of H—Mules.
S of M—Hand.

DIXIE COAL MINING COMPANY
Slope Mine; Jagger Seam; 48 to 72 in. thick. Operate washery.
PO—Jasper, Ala.; SP—McCullon; CTY—Walker; RR—Frisco.
PR—J. W. Lewis..........Jasper, Ala.
TR—J. E. Ross, " "
GM—J. E. Ross, " "
GS—J. E. Ross, " "
PA—M. B. Taylor, " "
SM—M. B. Taylor, " "
MS—J. C. Wooton, " "
MM—Ben Treego, " "
S of H—Mules and rope.
S of M—Hand.
PP—Water tube boiler, total 125 H. P., 1 pump.
EMP—40. Daily output 100 tons.
Successors to Eagle Coal Mining Co.

DONALDSON-ROUTLEDGE COAL CO.
General Office, Ensley, Ala.
Nos. 1, 3, 4, 5, 6, Mines; Drifts; Pratt Seam; 38 to 40 in. thick.
PO—Watson, Ala.; SP—Mineral Springs; CTY—Jefferson; RR—L. & N., Praco Br.
PR—S. J. Routledge......Ensley, Ala.
GS—S. J. Routledge, " "
MS—S. J. Routledge, " "
TR—J. M. Donaldson, " "
EM—A. B. Mitchell..Birmingham, Ala.
S of H—Mules and 1 steam loco. Track gauge 36 in.
S of M—Hand.
PP—3 pumps.
EMP—50. Last fiscal year output 50,000 tons.

EAGLE COAL MINING COMPANY.
See Dixie Coal Mng. Co.

EAST PRATT COAL CO.
General Office, 205-6 Woodward Bldg., Birmingham, Ala.
Clift Mine, Drift; Pratt Seam; 36 in. to 44 in. thick.
PO—R. 7, Box 53, Birmingham, Ala.; SP—Clift, Ala.; CTY—Jefferson; RR—L. & N., Cain Creek Br.
PR—J. T. Morgan..Birmingham, Ala.
TR—J. T. Morgan, " "
GM—T. W. Morgan, Birmingham, Ala.
MS—T. W. Morgan, " "
EM—T. W. Morgan, " "
PA—D. S. Acuff, " "
SM—D. S. Acuff, " "
S of H—Mules, and 1 gasoline loco.; track gauge 36 in.
S of M—Hand.
EMP—80. Last fiscal year output 50,000 tons.

EDMONDS COAL CO.
Eclipse Mine, Drift; Black Creek Seam, 28 to 36 in. thick.
PO—Natural Bridge, Ala.; SP—Same, CTY—Winston; RR—N. A.
PR—J. A. Edmonds, Natural Bridge, Ala.
GM—J A. Edmonds, " "
PA—J. A. Edmonds, " "
MS—J. A. Edmonds, " "
CE—E. P. Lintz....Birmingham, Ala.
EM—E. P. Lintz, " "
S of H—Mules and Rope; track gauge, 36 in.
S of M—Hand.
PP—1 pump.
EMP—45. Last fiscal year output 16,947 tons.
Sales agency, Alabama Coal Mining Co.

ELDORADO COAL CO.
General Office, Birmingham, Ala.
Coalburg Mine; Drift; Pratt Seam, 38 in. thick. RR—L. & N.
MS—Chas. Atkins.....Birmingham, Ala.
MF—John C. Neil, " "
S of M—Hand.
EMP—80. Last fiscal year output 24,292 tons.

Wallmore Mine; Slope and Drift; Pratt Seam 38 in. thick. RR—Sou.
MS—T. J. Payne........Watson, Ala.
S of M—Hand.
EMP—50. Last fiscal year output, 43,605 tons. State report.

EMPIRE COAL CO.
General Office, Birmingham, Ala.
Empire Mine; Drift, Black Creek Seam, 26 to 36 in. thick. Operate washery.
PO—Empire, Ala.; SP—Same; CTY—Walker; RR—Frisco.
PR—Walter Moore....Birmingham, Ala.
TR—W. C. Hamilton, " "
EM—T. L. Nelson
MS—Chas. P. Moore......Empire, Ala.
MM—W. G. Heinz, " "
SM—J. D. Glasgow, " "
S of H—2 gasoline loco.; track gauge 36 in.
S of M—35 Comp. air mach.
PP—7 Casey-Hedges return tubular boilers, total 1,000 H. P., 3 compressors, 3 pumps.
EMP—450; coke ovens 100 Bee Hive. Last fiscal year output 225,000 tons.

EUREKA COAL CO.
General Office, Birmingham, Ala.
No. 2 Mine; Slope; Helena Seam, 36 to 72 in. thick.
PO—Helena, Ala.; SP—Falliston, Ala.; CTY—Shelby; RR—L. & N., A. B. & A.
PR—G. W. Connors, Birmingham, Ala.
GM—G. W. Connors, " "
TR—W. M. Hoke, " "
PA—W. M. Hoke, " "
GS—G. W. Postell, ...Helena, Ala.
MS—G. W. Postell, " "
EM—Chas. McCarroll,
MM—J. E. Douglass, ...Helena, Ala.
EE—J. E. Douglass, " "
SCO—Roebuck Commissionery. Buyer, A. R. Whorton, Helena, Ala.
S of H—1 elec. loco., elec. hoist and mules. Track gauge 36 in.
S of M—Hand.
PP—2 C. J. Walton & Sons, return tubular boilers, total 300 H.P., gen. unit, 250 volts D. C., 1 pump.
EMP—190. Last fiscal year output, 157,414 tons.
No. 3 Mine; Slope; Helena Seam; 36 to 72 in. thick. Will operate washery.
PO—Helena, Ala.; SP—Falliston, Ala.; CTY—Shelby; RR—L. & N., Mineral branch; A. B. A.
S of H—Mules and steam hoist. Track gauge 36 in.
S of M—Hand.
PP—1 Walsh & Weidner Marine boiler and 1 Walton return tubular boiler, total 230 H. P., 220 volts A. C., 3 phase, 60 cycles, 1 pump. Purchase power.
EMP—35. Last fiscal year output 6,000 tons.
Sales Agency, D. H. Brown & Co., Birmingham, Ala.

EXCELSIOR COAL & IRON COMPANY.
Excelsior Mine, Slope; Jagger Seam; 3 to 5 ft. thick.
PO—Cordova, Ala. SP—Same. CTY—Walker; RR—Frisco, I. C. and Southern.
PR—D. S. Gregg......Cordova, Ala.
TR—A. M. Konkle, " "
PA—A. M. Konkle, " "
MS—W. L. Miller, " "
SM—A. M. Konkle, " "
S of H—Mules and rope; track gauge 36 in.
S of M—Hand.
PP—1 Return tubular boiler total 100 H. P.; 1 engine; 1 pump.
EMP—35. Last fiscal year output 25,000 tons.
Note—Idle during past year.

EXPORT PRATT COAL CO.
Export Pratt Mine, Drift, Nickle Plate Seam, 32 to 38 in thick.
PO—Quinton, Ala.; SP—Praco, Ala.; CTY—Jefferson; RR—L. & N.
PR—T. T. Ferrell.......Quinton, Ala.
TR—T. T. Ferrell, " "
GM—T. T. Ferrell, " "
PA—R. C. Harvey, " "
GS—L. F. Bryson, " "
EM—C. E. Miller, " "
CE—C. E. Miller,
S of H—Mules.
S of M—Hand.
EMP—50. Last fiscal year output 19,458 tons.

FAIRCHILDS COAL & COKE CO.
Fairchilds Mine.
See Alabama Coal Co.

GALLOWAY COAL CO.
General Office, Memphis, Tenn.
PR—R. Galloway......Memphis, Tenn.
TR—Cryus Garnsey, Jr. " "
GM—Cyrus Garnsey, Jr.
GS—James Nicol, Jr. Carbon Hill Ala.
PA—H. T. Peters, " "
EM—S. Cummings, " "
MM—D. C. Johnson, " "
SM—H. T. Peters,

No. 11 Mine; Slope; Jagger Seam, 40 to 56 in. thick. Operate washery.
PO—Carbon Hill, Ala.; SP—Same; CTY—Walker; RR—Frisco.
MS—V. West........Carbon Hill, Ala.
S of H—6 elec. locos. Track gauge 40 in.
S of M—8 elec. mach.
PP—5 return tubular boilers, total 670 H. P., 2—150 K. W. gen. units, 250 volts D. C., 1 pump, 1 air compressor.
EMP—350. Last fiscal year output 146,059 tons.

Great Elk Mine; Shaft; Jagger Seam; 42 to 58 in. thick. Operate washery.
PO—Carbon Hill, Ala.; SP—Same; CTY—Walker; RR—Frisco.
MS—James Nicol, Sr., Carbon Hill, Ala.
S of H—Mules and rope. Track gauge 36 in.
S of M—12 comp. air mach.
PP—5 return tubular boilers, total 465 H. P., 5 pumps, 2 air comp.
EMP—200. Last fiscal year output 95,081 tons.

No. 10 Mine; Slope; Jagger Seam; 52 to 56 in. thick.
PO—Carbon Hill, Ala.; SP—Same; CTY—Walker; RR—Frisco.
MS—J. M. Townley, Carbon Hill, Ala.
S of H—Mules and rope. Track gauge 40 in.
PP—1 return tubular boiler, total 40 H. P., 1 pump.
EMP—15. Last calendar year output 39,996 tons.

Alabama Coal Co. Mine; Slope; Jagger Seam; 36 to 48 in. thick.
PO—Carbon Hill, Ala.; SP—Same; CTY Walker; RR—Frisco.
MS—J. M. Gray.....Carbon Hill, Ala.
S of H—Mules and rope.
PP—1 return tubular boiler, total 75 H. P., 1 pump.
EMP—12. Last calendar year output 15,473 tons.

Chickasaw Mine; Shaft; Pagger Seam; 48 to 54 in. thick. Operate washery.
PO—Chickasaw, Ala.; SP—Same; CTY—Walker; RR—Frisco.
MS—Robert Lang......Chickasaw, Ala.
SM—G. L. Wakefield, " "
PP—6 return tubular boilers, total 240 H. P., 2 pumps, 1 air comp.
EMP—42. Last calendar year output 62,077 tons.

Garnsey Mine; Slope; Thompson Seam; 72 in. thick. Operate washery.
PO—Garnsey, Ala.; SP—Same; CTY—Bibb; RR—Southern & L. & N.
Asst Supt—J. G. Teaford, Garnsey, Ala.
MS—J. G. Teaford, " "
EM—J. S. Watts, " "
S of H—Mules and 2 gasoline locos.
PP—8 boilers, total 680 H. P., 1 pump.
EMP—308. Last fiscal year output 174,122 tons.

GLEN MARY COAL CO.
Drift Mine; Black Creek Seam; 18 to 32 in. thick.
PO—Natural Bridge, Ala.; SP—Glen Mary, Ala.; CTY—Winston, Ala. RR—N. A.
GM—J. M. Thomasson, Natural Bridge, Ala.
PR—J. M. Thomasson, " "
PA—J. M. Thomasson, " "
S of H—1 gasoline loco. and mules.
S of M—Hand.
EMP—15. Last fiscal year output 3,000 tons.

GULF STATE STEEL CO.
General Office, Birmingham, Ala.
Virginia Mine; Slope, Nickle Plate Seam, 50 to 54 in. thick.
PO—Bessemer, Ala.; SP—Same; CTY—Jefferson; RR—L. & N.
PR—James Bowron....Birmingham, Ala.
TR—A, R. Forsythe, " "
GS—James E. Strong, " "
PA—B. F. Tyler,
MS—W. M. Mason, R. F. D., Bessemer, Ala.
S of H—2 gasoline motors and mules; track gauge 36 in.
S of M—Hand.
PP—9 return tubular boilers, total 1,000 H. P., 2 compressors.
Sales Agent, H. Sanborn Smith, Birmingham, Ala.
Coke ovens 301 Bee Hive.

HELENA-CAHABA MINING CO.
General Office, Birmingham, Ala.
Coalmont Mine; Slope; Woodstock Seam; 48 to 60 in. thick. Operate washery.
PO—R. F. D. No. 1, Maylene, Ala.; SP—Coalmont, Ala.; CTY—Shelby; RR—L. & N. and A. B. & A.
PR—James Bonnyman, Birmingham, Ala.
TR—P. J. Garland, " "
PA—John Bonnyman, " "
SM—John Bonnyman,
MS—J. H. Tinney, R. F. D. 1, Maylene, Ala.
S of H—Mules and hoist. Track gauge 36 in.
S of M—Hand.
PP—3 Atlas return tubular boilers, total 375 H. P., 1 gen. unit, 2200 volts A. C., 3 phase, 60 cycle, 2 pumps.
EMP—225. Last fiscal year output 93,000 tons.

HENRY, JOHN. COAL CO.
Mine worked out.

HILLS CREEK MINING CO.
General Office, Blocton, Ala.
Hills Creek Mine; Slope, Woodstock Seam, 24 to 60 in. thick.
PO—Blockton, Ala.; SP—Same; CTY—Bibb; RR—L. & N., M. & O., Woodstock & A. G. S. Sou., Blocton br.
PR—George W. Randall..Blocton, Ala.
TR—S. S. Allen, " "
GM—W. R. Young, " "
PA—W. R. Young, " "
GS—W. R. Ray, " "
MS—W. R. Ray, " "
MM—W. J. Lawrence, " "
SM—H. R. Cook,, " "
EE—W. J. Lawrence,
EM—A. H. Witt.....Birmingham, Ala.
S of H—Mules and rope; track gauge 35 in.
S of M—Hand and 1 elec. mach.
PP—2 return tubular boilers, total 250 H. P., 2 pumps.
EMP—150. Last fiscal year output 53,800 tons.
Sales Agency, T. H. Benners & Co., Birmingham, Ala.

HOLT COAL CO.
Winfield, Ala. No report.

IMPERIAL COAL & COKE CO.
General Office, Birmingham, Ala.
Dixiana Mine; Slope; Black Creek Seam; 30 in. thick; Operate Washery.
PO—Pinson, Ala.; SP—Bradford, Ala.; CTY—Jefferson; RR—L. & N., Mineral Br.
PR—M. W. Bush, Box 287 Birmingham, Ala.
TR—H. Hammond, " "
PA—H. L. Morrow, " "
MS—J. O. Colley........Pinson, Ala.
S of H—2 elec. loco. and rope.
S of M—Hand.
PP—5 return tubular boilers, total 280 H. P., gen. unit, 250 volts D. C., 7 pumps.
EMP—230. Coke ovens 103 Bee Hive. Output 800 tons per day.

INDIAN HEAD MILLS OF ALABAMA.
Indian Head Mine; Drift; Mt. Carmel Seam, 32 to 60 in. thick.
PO—Cordova, Ala.; SP—Same; CTY—Walker; RR—Sou, Frisco.
PR—Geo. A. Draper, ..Boston, Mass.
TR—Harcourt Amory, " "
PA—Scott Maxwell, ...Cordova, Ala.
GS—Scott Maxwell, " "
MS—W. B. Earnest, " "
MM—R. Thisk,
S of H—Mules and rope.
S of M—1 Comp. air mach.
PP—Power furnished from millplant.
EMP—10. Last fiscal year output 14,000 tons.
Mine coal for their own use.

JAGGER COAL CO.
General Office, Birmingham, Ala.
Jagger Mine; Slope, Jagger Seam, 54 in. thick.
PO—Prospect, Ala.; SP—Jagger, Ala.; RR—N. A.
PR—J. C.Patterson....Birmingham, Ala.
GM—E. P. Rosamond, " "
MS—W. W. Clark......Prospect, Ala.
S of H—Mules.
S of M—6 comp. air mach.
PP—2 return tubular boilers, total 205P H. P., 1 compressor, 3 pumps.
EMP—65.

JAGGER CREEK FUEL CO.
Jagger Mine, Drift.
PO—Carbon Hill, Ala. SP—Same—CTY—Walker. RR—Frisco.
PR—Chas. J. Smith...Birmingham, Ala.
VP—Jos. R. Smith, Jr., " "
TR—Hunter M. Smith, " "
GM—Hunter M. Smith, " "
PA—Henley J. Smith, " "
MS—P. O. Goodwin...Carbon Hill, Ala.
EM—Motley & Dryer..Birmingham, Ala.
S of H—2 Loco., mules and rope.
S of M—7 Comp. air mach.
PP—4 boilers, total 380 H.P. 1 comp.
EMP—101.

JONES COAL CO.
Out of business.

JORDAN COAL CO.
Sleepy Hollow Mine, Drift, Pratt Seam, 36 in. thick.
PO—Blossburg, Ala.; SP—Same; CTY—Jefferson; RR—Sou., Blossburg Div.
PR—P. R. Jordan......Blossburg, Ala.
TR—P. R. Jordan, " "
GM—P. R. Jordan, " "
PA—P. R. Jordan, " "
MS—P. R. Jordan, " "
EM—P. R. Jordan, " "
S of H—Mules; track gauge 36 in.
S of M—Hand.
EMP—100. Last fiscal year output 42,000 tons.

LEHIGH COAL CO.
Lehigh Mine, 3 Drifts, Black Creek Seam, 30 to 40 in. thick.
PO—Lehigh, Ala. SP—Same. CTY—Blount.
PR—Priestley Toulmin, ..Lehigh, Ala.
TR—Priestley Toulmin, " "
GM—Priestley Toulmin, " "
PA—Priestley Toulmin, " "
MS—Aug. Binner, " "
SM—D. O. McGhee, " "
S of H—Mules. Track gauge, 36 in.

LITTLE CAHABA COAL CO.
Piper Nos. 1 and 2 Mines.
PO—Piper, Ala.; SP—Same; CTY—Bibb; RR—Southern L. & N.
PR—J. R. Smith, Jr.......Piper, Ala.
TR—W. E. Henley, " "
PA—W. E. Henley, " "
MS—Jas. Wilcox, " "
SM—Geo. Atwood, " "
EM—Geo. T. Elliott, " "
MM—L. H. Perry, " "
S of M—Hand.

LINE CREEK COAL & COKE CO.
Line Creek Mine; Drift; Black Creek Seam; 24 to 60 in. thick.
PO—Sligo, Ala.; SP—Same; CTY—Etowah; RR—N. C. & St. L. Huntsville Br.
PR—H. H. Camp........Sligo, Ala.
GM—Hope H. Camp, Jr., " "
GS—John Shaw Camp, " "
PA—John Shaw Samp, " "
EM—F. G. Lee............Sligo, Ala.
MS—Jess T. Lochart........Sligo, Ala.
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—1 pump
EMP—20 to 35. Last fiscal year output, 23,000 tons.
Note—Idle for several months past.

McCORMACK & RAMSEY.
General Office, Birmingham, Ala.
New Castle Mine; Slope; Mary Lee Seam; 60 to 84 in. thick. Operate washery.
PO—New Castle, Ala.; SP—Same; CTY—Jefferson; RR—L. & N.
PR—G.B.McCormack, Birmingham, Ala.
GM—C. McCormack...Birmingham, Ala.
PA—W. E. Hendrick..New Castle, Ala.
MS—C. M. Parker, " "
EM—A. S. Pow, " "
SM—W. E. Hendricks, " "
MM—J. M. Denton, " "
S of H—Mules, rope and 3 steam loco.; track gauge 36 in.
S of M—Hand.
PP—6 return tubular boilers, total 675 H. P., 4 air comp., 4 pumps.
EMP—350. 374 Bee Hive coke ovens. Last fiscal year output 100,000 tons.

MABEL MINING COMPANY.
Rio Dell Mine, Drift, "Black Creek" Seam; 30 to 36 in. thick.
PO—Warrior, Ala.; SP—El Vista, Ala., (Prepay); CTY—Jefferson; RR—L. & N., Linton br.

(Continued on Next Page.)

Mabel Mining Co.—Cont.
PR—T. M. Davidson.....Warrior, Ala.
TR—T. M. Davidson, " "
GS—L. K. Moss, " "
CM—L. K. Moss, " "
PA—G. D. Etter, Jr. " "
MS—G. D. Etter, Jr., " "
SM—J. B. Huffstutter.
EM—A. H. Witt,...Birmingham, Ala.
MM—Walter Tuck, " "
EE—Walter Tuck, " "
S of H—1 steam loco., track gauge 36 in.
S of M—Hand.
EMP—50. Last fiscal year output 12,790 tons. Sales agent, D. H. Brown & Co., Birmingham, Ala.

MAJESTIC COAL COMPANY
General Office, Birmingham, Ala.
Shaft Mine; Black Creek Seam.
PO—R. F. D. No. 2, Morris, Ala.; SP—Majestic, Ala.; CTY—Jefferson; RR L. & N.
PR—M. W. Bush.....Birmingham, Ala.
GM—M. W. Bush, " "
TR—H. Hammond, " "
GS—J. O. Colley,
R. F. D. No. 2, Pinson, Ala.
S of H—Steam loco.
Note—Successors to De Sota Coal Mining & Development Co.

MILLER COAL CO.
Miller Mine; Drift; Mt. Carmel Seam, 34 to 36 in. thick.
PO—Cordova, Ala.; SP—Same; CTY—Walker; RR—Frisco and I. C.
PR—W. L. Miller........Cordova, Ala.
GM—W. L. Miller, " "
PA—W. L. Miller, " "
MS—W. L. Miller, " "
CE—Hooper Collier, "
SCO—Cordova Supply Co. Buyer, W. L. Miller, Cordova, Ala.
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—1 Boiler, 1 pump.
EMP—10. Output for 3 months, 415 tons.
Sales Agency, J. B. Robinson & Co., Birmingham, Ala.

MONTEVALLO MINING CO.
Gen. Office, 1903 Amer. Trust Bldg., Birmingham, Ala.
Aldrich Mine, Slope; Montevallo Seam; 30 to 36 in. thick; operate washery.
PO—Aldrich, Ala.; SP—Same; CTY—Shelby; RR—Southern, Mobile div.
PR—W. S. Lovell,
1903 Amer. Trust Bldg., Birmingham, Ala.
TR—W. S. Lovell,
1903 Amer. Trust Bldg., Birmingham, Ala.
GM—W. S. Lovell,
1903 Amer. Trust Bldg., Birmingham, Ala.
PA—W. S. Lovell,
1903 Amer. Trust Bldg., Birmingham, Ala.
SEC—D. A. Thomas,
1903 Amer. Trust Bldg., Birmingham, Ala.
MS—W. M. Lacey......Aldrich, Ala.
SM—George Yessick, " "
EM H. M. McFarland, " "
MM—C. B. Brown, " "
EE—R. G. Merrill, " "
S of H—Mules, rope, 2 elec. and 5 gasoline locos. Track gauge 36 in.
S of M—7 elec. and 3 comp. air mach.
PP—7 Water tube boilers total 925 H. P. 2 gen. units, 250 volts, D. C.; 1 air comp., and 1 pump.
EMP—311. Last fiscal year output 109,322 tons.

MONTEVALLO DOMESTIC COAL CO.
General Office, Montevallo, Ala.
Dogwood Mine; Slope; Montevallo Seam 24 to 96 in. thick.
PO—Montevallo, Ala. SP—Dogwood, Ala. CTY—Shelby RR—Southern.
PR—A. J. Watrous,...Montevallo, Ala.
GM—A. J. Watrous, " "
TR—S. B. Tiley,........Essex, Conn.
MS—J. W. Curd,......Montevallo, Ala.
S of H—Mules & Rope. Gauge of track 36 in.
S of M—Hand & Compressed Air Mach.
PP—One boiler Total 80 H. P., 1 pump, 1 Air compressor.
EMP—30.

MONTEVALLO—SHELBY COAL CO.
Straven Mine, Slope, Montevallo Seam 30 to 36 in. thick.
PO—Straven, Ala.; SP—Same; CTY—Shelby; RR—Southern.
PR—F. B. Dunlap......Straven, Ala.
TR—F. B. Dunlap, " "
MS—Wm. Murray, " "
PA—C. A. Killian, " "
SM—C. A. Killian, " "
MM—Robt. Cotter, " "
S of H—Rope and steam.
S of M—Hand.
PP—2 Return tubular boilers, 1 pump. Purchase power.
Last fiscal year output 24,000 tons.

NEW FOUND CREEK COAL CO.
Eulamo Mine, Drift; Pratt Seam, 40 in. thick.
PO—Morris, Ala.; SP—Eulamo, Ala., CTY—Jefferson; RR—L. & N. Cone Creek Br.
PR—A. F. Morton,
R. F. D. 1, Box 70, Morris, Ala.
GM—A. F. Morton,
R. F. D. 1, Box 70, Morris, Ala.
MS—A. F. Morton,
R. F. D. 1, Box 70, Morris, Ala.
TR—J. C. Patterson, Birmingham, Ala.
EM—J. C. Patterson, " "
PA—J. C. Arnold........Morris, Ala.
SM—J. C. Arnold, " "
S of H—Mules and 2 gasoline loco. Track gauge 36 in.
S of M—Hand.
Last fiscal year output, 54,006 tons.

NICKEL PLATE COAL CO.
Jasper, Ala. No report.

NORTH PRATT COAL CO.
Hillhouse Mine, Drift; Pratt Seam; 3 to 4 ft. thick.
PO—Adamsville, Ala. SP—Udora, Ala CTY—Jefferson. RR—L. & N. Praco Branch.
PR—Jas. Hillhouse, Birmingham, Ala.
TR—H. C. Hillhouse, Adamsville, Ala.
GM—J. D. Hillhouse, " "
MS—J. D. Hillhouse, " "
PA—Harry C. Hillhouse, " "
SM—W. L. Arnold, " "
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—Purchase power.
EMP—50. Last fiscal year output 40,000 tons. Sales agent, T. H. Benners & Co., Birmingham, Ala.

OAKMAN MINING CO.
Leonora Mine; Drift; Corona Seam, 30 to 36 in. thick.
PO—Oakman, Ala.; SP—Same; CTY—Walker. RR—Southern.
PR—Geo. B. Hooper, .. Oakman, Ala.
GM—Geo. B. Hooper, " "
PA—Geo. B. Hooper, " "
MS—S. Robbins, " "
EM—H. Collier..........Oakman, Ala.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
Last fiscal year output, 13,752 tons

O'REAR MINING CO.
O'Rear Mine, Drift; America and Pratt Seam 52 in. thick.
PO—Parrish; SP—Drifton; CTY—Walker; RR—Sou.
PR—Guy V. O'Rear......Parrish, Ala.
TR—Guy V. O'Rear, " "
GM—Guy V. O'Rear, " "
SM—Guy V. O'Rear, " "
MS—L. E. Broom.......Drifton, Ala.
S of H—Mules.
S of M—Hand.
EMP—45. Last fiscal year output 12,500 tons.

PAYNE BEND WARRIOR COAL CO.
General Office, Birmingham, Ala.
Payne Bend Mine; drift; Pratt Seam, 35 to 42 in. thick.
PO—Quinton, Ala.; SP—Maxine; CTY—Walker.
PR—Dr. W. C. Head......Johns, Ala.
TR—D. M. Lewis........Ensley, Ala.
PA—D. M. Lewis, " "
GM—C. C. Huckabee, Birmingham, Ala.
EM—C. C. Huckabee " "
CE—C. C. Huckabee " "
MS—W. P. Crane.......Quinton, Ala.
SCO—Payne Bend Warrior Coal Co. Buyer, W. B. Brown, Quinton, Ala.
S of H—Mules. Track gauge 42 in.
S of M—Hand.
EMP—45. Last fiscal year output 36,500 tons.

PIERCE COAL & LUMBER CO.
General Office, Bridgeport, Ala.
Belmont Mine; Drift; Belmont Seam; 36 to 48 in. thick.
PO—Pierceton, Ala.; SP—Lime Rock, Ala.; CTY—Jackson. RR—Southern, Pierceton Br.
PR—Dr. F. D. Pierce..Bridgeport, Ala.
GM—Dr. F. D. Pierce, " "
PA—Dr. F. D. Pierce, " "
TR—R. W. Pierce, ... Buffalo, N. Y.
MS—P. Kilgore........Pierceton, Ala.
SM—Earle Smith, " "
S of H—3 Steam loco. and mules. Track gauge 36 in.
S of M—2 Elec. and 2 comp. air mach. and hand.
PP—2 Return tubular boilers, total 300 H. P., gen. units, 250 volts D. C., 1 comp. and 1 pump.
EMP—20. Last fiscal year output 2,000 tons.

PRATT CONSOLIDATED COAL CO.
General Office, Birmingham, Ala.
PR—G. B. McCormack, Birmingham Ala.
TR—J. A. Shook, " "
GM—H. E. McCormack, " "
GS—E. B. Pennington
and E. P. Rosamond, " "
PA—R. N. Magill, " "
EM—Erskine Ramsay, " "
MM—R. G. Williams, Quinton, "
EE—R. G. Williams, " "
Sales agent, K. A. Conville, Birmingham, Ala.

New Pratt Mine, Drift; "Pratt" Seam, 36 to 42 in. thick.
PO—Blossburg, Ala.; SP—Same. CTY—Jefferson. RR—Southern Ry.
S of H—Mules. Track gauge gauge 36 in
S of M—Hand.
EMP—140. Last fiscal year output 59,010 tons.

Toga and Jett Mines, Drifts; "Pratt' Seam, 36 to 42 in. thick.
PO—Adamsville, Ala. SP—Toga, Ala., and Erskine, Ala.; CTY—Jefferson. RR—Southern Ry., and L. & N.
MS—E. B. Pennington, Birmingham, Ala.
S of H—Mules. Track gauge 36 and 42 in.
S of M—Hand.
EMP—115. Last fiscal year output 4,780 tons.

Mineral Springs Mine, Drift; "Pratt" Seam, 36 to 42 in. thick.
PO—Watson, Ala.; SP — Mineral Springs, Ala. CTY—Jefferson. RR L. & N.
MS—E. B. Pennington, Birmingham, Ala.
S of H—Mules. Track gauge 42 in.
S of M—Hand.
EMP—144. Last fiscal year output 57,943 tons.

Banner Mine, Shaft; "Big Seam," 84 in. thick. Operate washery.
PO—Littleton, Ala. SP—Banner, Ala. CTY—Jefferson. RR—L. & N.
S of H—Mules and 3 Electric Locomotives. Track gauge 42 in.
S of M—11 Electric Machines.
PP—6 boilers, total 900 H.P., 250 volts, D.C.; 1 Air Compressor.
EMP—275. Last fiscal year output 447,483 tons.

Arcadia Mine, Drift; "Pratt" Seam; 36 to 42 in. thick.
PO—Birmingham, Ala., R.F.D. No. 7; SP—Arcadia, Ala.; CTY—Jefferson. RR—L. & N.
MS—E. B. Pennington, Birmingham, Ala.
S of H—Mules. Track gauge 42 in.
S of M—Hand.
..EMP—106. Last fiscal year output 71,819 tons.

Crocker Mine, Drift; "Pratt" Seam; 36 to 42 in. thick.
PO—Morris, Ala., R.F.D. SP—Durant, Ala. CTY—Jefferson. RR—L.&N.
MS—E. B. Pennington, Birmingham, Ala
S of H—Mules. Track gauge 42 in.
S of M—Hand.
EMP—76. Last fiscal year output 33,620 tons.

Dora Nos. 8 and 10 Mines; Drift and Slope; "Big Seam" 48 to 84 in. thick. Operate washery.
PO—Dora, Ala.; SP—Same. CTY—Walker. RR—Frisco, R.R.
MS—C. S. Ramsay, ... Dora, Ala.
S of H—Mules and 2 Electric Locomotives. Track gauge 36 in.
S of M—Hand.
PP—6 boilers, total 740 H.P., 250 volts, D.C.
EMP—237. Coke ovens—60 Bee Hive.
Last fiscal year output 79,350 tons.

Clipper Mine, Slope; "Big Seam," 48 to 84 in. thick.
PO—Dora, Ala.; SP—Same, and Red Star, Ala.; CTY—Walker. RR—Southern Ry.
MS—C. S. Ramsay....... Dora, Ala
S of H—Mules. Track gauge 36 in
S of M—Hand.
EMP—173. Last fiscal year output 123,810 tons.

Colta, Gamma and Wegra Mines, Slopes; "Big Seam," 60 to 96 in. thick. Operate washeries.
PO—Quinton, Ala.; SP—Colta, Ala., and Wegra, Ala. CTY—Walker. RR—L. & N.
MS—J. D. Hollis, ...Quinton, Ala.
S of H—Mules. Track gauge 42 in.
S of M—Hand.
PP—5 Erie City Return tubular boilers, total 750 H.P.; 3 generating units, 500 volts, D.C.
EMP—206. Last fiscal year output 129,795 tons.

Maxine Mine, Slope and Drift, "Pratt" Seam; 36 to 48 in. thick. Operate Washery.
PO—Quinton, Ala.; SP—Maxine, Ala CTY—Jefferson. RR—Southern Ry
MS—C. B. McCormack, Quinton, Ala
S of H—Mules and 1 Electric Locomotive. Track gauge 42 in.
S of M—Hand.
PP—2 boilers, total 300 H.P., 250 volts, D.C.
EMP—118. Last fiscal year output, 42,908 tons.

Gamble Mine, Slope; "Big Seam," 42 to 84 in. thick.
PO—Gamble Mines, Ala.; SP—Same CTY—Walker. RR—Northern Ala. Ry.
MS—J. A. Brakefield, Gamble Mines Ala.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
EMP—100. Last fiscal year output 20,764 tons.

Eldorado Mine, Slope, "Pratt" Seam; 36 to 42 in. thick.
PO—Watson, Ala. SP—Eldorado, Ala. CTY—Jefferson. RR—L. & N.
MS—G. B. McCormack, Jr., Watson, Al.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
EMP—114. Last fiscal year output 84,174 tons.

Praco Mine, Drift; "Big Seam," 84 in. thick.
PO—Quinton, Ala.; SP—Praco, Ala; CTY—Jefferson. RR—L. & N.
S of H—Mules. Track gauge 42 in.
S of M—Hand.

RACCOON MINING COMPANY.
General Office, Gadsden, Ala.
Altoona Mine; Drift! Black Creek Seam: 40 in. thick. Operate washery.
PO—Altoona, Ala.; SP—Same. CTY—Etowah. RR—L. & N. Ry. Co.
PR—E. T. Schuler......Gadsden, Ala.
TR—E. T. Schuler, " "
GM—E. T. Schuler, " "
GS—W. L. Smith.......Altoona, Ala.
S of H—1 elec. loco. Track gauge 40 in.
S of M—Hand and 2 Elec. mach.
PP—1 Heine water tube boiler, 125 H. P., 1 gen. unit, 250 volts A. C.
EMP—75. Last fiscal year output, 30,000 tons.

RED EAGLE COAL COMPANY.
General Office, Birmingham, Ala.
Weatherford Mine; Slope; Blocton No. 1 Seam; 42 in. thick.
PO—Blocton, Ala.; SP—Weatherford, Ala. CTY—Bibb. RR—Mobile & Ohio, Blocton Branch.
PR—Hampton S. Smith,
Birmingham, Ala.
GM—Hampton S. Smith, " "
TR—Hampton S. Smith, " "
MS—C. E. Crandell......Blocton, Ala.
EE—B. C. Steadman, " "
SM—A. B. Kaub, " "
MM—Alvin Whitten, " "
CE—Motley & Dryer,
Birmingham, Ala.
S of H—Mules, rope, elec. and steam locos; track gauge 42 in.
S of M—Hand.
PP—Boilers, total 300 H. P., 2 pumps. Purchase power.
EMP—130. Last fiscal year output 80,000 tons.
Sales Agent, J. B. Robinson & Co., Borminghom, Ala.

RED FEATHER COAL CO.
General Office, Blocton, Ala.
Red Feather Mine; Slope; Underwood Seam; 18 to 72 in. thick. Operate washery.
PO—Blocton, Ala.; SP Red Feather; CTY—Bibb; RR—Mobile & Ohio.
PR—C. B. Wilburn.......Blocton, Ala.
TR—J. B. Campbell......Atlanta, Ga.
PA—C. B. Wilburn.......Blocton, Ala.
MS—R. T. Boone, " "
EM—C. C. Huckabee..Birmingham, Ala.
MM—T. E. Peyton......Blocton, Ala.
SM—C. F. Wilburn, " "
S of H—Mules, rope, and 3 comp. air locos.
PP—4 water tube boilers, total 500 H. P., 2 pumps, 2 air comp.
EMP—250.

REPUBLIC IRON & STEEL CO. (SOUTHERN DISTRICT.)
General Office, Youngstown, O.
PR—T. J. Bray........Youngstown, O.
TR—H. M. Hurd, " "
GM—C. T. Fairbairn..Birmingham, Ala.
PA—R. L. Cross, " "
CE—M. J. Lide, " "
GS—F. G. Morris......Sayreton Ala.
EM—(Chief) R. E. Butler " "
EE—(")W. J. Donahoo, " "

Palos Mine; Slope, Mary Lee Seam, 102 to 168 in. thick.
PO—Palos, Ala.; SP—Same; CTY—Jefferson; RR—Frisco.
MS—W. W. Kicker........Palos, Ala.
MM—Tom Pinion, " "
S of H—Rope, mules and gravity plane; track gauge 36 in.
S of M—3 Elec. mach. and hand.
PP—4 Return tubular boilers, total 500 H. P., gen. unit, 440 volts A. C., 3 phase 60 cycles; 2 pumps.
EMP—227. Last fiscal year output, 145,723 tons.

Warner No. 1 Mine; Slope and drift; Pratt Seam, 30 to 62 in. thick; Operate Washery.
PO—Republic, Ala.; SP—Same; CTY—Jefferson; RR—Sou.
MS—R. C. Wynn........Republic, Ala.
MM—Chas. Griffin, " "
S of H—11 Elec. loco., rope and mules; track gauge 36 in.
S of M—Hand.

(Continued on Next Page.)

PP—10 Return tubular boilers, total 1,250 H. P., 2 gen. units, 500 volts D. C., 5 pumps.
EMP—449; Coke ovens, 100 Bee Hive. Last fiscal year output 273,543 tons.

Sayreton Mine; Slope, Mary Lee Seam, 60 to 108 in. thick; Operate Washery.
PO—Sayreton, Ala.; SP—N. Birmingham, Ala.; CTY—Jefferson; RR—Thomas & Sayreton (Company owned).
MS—J. G. Meagher......Sayreton, Ala.
MM—C. C. Peyton, " "
S of H—5 Elec. loco., mules and gravity plane; track gauge 42 in.
S of M—Hand.
PP—6 Return tubular boilers, total 900 H. P., 2 gen. units, 250 volts D. C., 550 volts A. C., 3 phase, 60 cycles.
EMP—386. Coke ovens, 910 Bee Hive, at Thomas, Ala. Last fiscal year output, 381,918 tons.

ROBBINS COAL CO.
Winston Mine; Drift; Brack Creek Seam, 20 to 38 inches thick.
PO—Lynn, Ala.; CTY—Winston; RR—N. A.
PR—S. O. Robbins........Lynn, Ala.
MS—S. O. Robbins, " "
TR—J. M. Romine,......Nauvoo, Ala.
PA—J. M. Romine, " "
EMP—3.
S of H—Mules; track gauge 36 in.
Sales Agency, T. E. Bradford.

RODEN COAL COMPANY.
Marvel Mine; Slope; Clark Seam 36 to 70 in. thick. Operate washery.
PO—Marvel, Ala.; SP—Same CTY—Bibb. RR—L. & N. and Southern.
PR—B. F. Roden, ... Marvel, Ala.
GM—B. F. Roden, " "
PA—B. F. Roden, " "
TR—J. H. Pheylen, " "
GS—T. B. Dryer, " "
EM—I. W. Miller, " "
MM—W. F. Cochrane, " "
EE—J. R. Liddle, " "
SM—G. E. Ellis, " "
CE—Martin J. Lide,..Birmingham,- Ala.
SCO—Roden Coal Co., Marvel, Ala.
S of H—Mule. Track gauge 42 in.
S of M—Hand.
PP—3 Wick's water tube boilers, total 900 H.P.; 2 generating units, 2,300 volts, A.C.; 3 phase; 60 cycle.
EMP—600. Last fiscal year output 268,000 tons. Sales agent, B. B. Smith, Birmingham, Ala.

ROMINE MERCANTILE CO.
Nauvoo, Ala. No report.

SAMOSET COAL CO.
General Office, Burnwell Mines, Ala.
Samoset Mine, Slope; "Big Seam," 3 to 8 ft. thick.
PO—Samoset, Ala.; SP—Same. CTY—Walker. RR—Illinois Central and Frisco System.
PR—Harry S. Jenkins.
TR—F. A. Grider, Birmingham, Ala.
GM—H. E. Fleetwood, Burnwell, Ala.
GS—H. E. Fleetwood, " "
PA—H. E. Fleetwood, " "
MS—Jas. Cantley........Samoset, Ala.
MM—W. Cantley, " "
CE—H. A. Turner.....Birmingham, Ala.
EM—H. A. Turner, " "
SM—C. A. Butler, " "
S of H—Mules and tail rope. Track gauge 36 in.
S of M—Hand.
PP—3 return tubular boilers, total 240 H.P.
EMP—58. Last fiscal year output 58,140 tons. Sales agent, F. A. Grider.

SAYRE MINING & MFG. CO.
General Office, Birmingham, Ala.
Sayre Mine, Slope; Mary Lee Seam, 4 ft. thick.
PO—Sayre, Ala.; SP—Same. CTY—Jefferson. RR—L.&N., Praco Br.
PR—A. N. Cleaver, South Bethlehem Pa
TR—T. F. Randolph, Birmingham, Ala.
MS—F. T. Palmer, ... Sayre, Ala.
SM—W. H. Dennis, " "
S of H—2 Elec. loco. and endless rope. Track gauge 42 in.
S of M—Hand.
PP—7 Return tubular boilers, total 450 H.P.; 2 gen. units, 250 volts D.C.; 2 pumps.
EMP—250. Coke ovens, 150 Bee Hive.

SEMI-CANNEL COAL CO.
See Alabama Semi-Cannel Coal Co.

SIBLEY BRICK CO.
General Office, Birmingham, Ala.
Langley Nos. 1 and 2 Mines, Drift. "Black Creek" Seam; 20 to 36 in. thick.
PO—Warrior, Ala.; SP—Langley, Ala.; CTY—Jefferson; RR—L. & N.
PR—Edward Hiller, Birmingham, Ala.
TR—Sidney Hiller, " "
GM—W. C. Scott........Warrior, Ala.
PA—W. C. Scott, " "
MS—Paul Bromlehe, " "
CE—Motley & Dryer, Birmingham, Ala.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
EMP—58. Last fiscal year output 6,521 tons.

SIPSEY COAL MINING CO.
General Office, R. F. D. No. 1, Empire, Ala.
Dilworth Mine; Drift; Black Creek Seam; 26 to 30 in. thick. Operate washery.
PO—Empire, Ala.; SP—Dilworth, Ala.; CTY—Walker; RR—Frisco, Empire br.
PR—John E. Dilworth, R. D. No. 1, Empire, Ala.
TR—John E. Dilworth, R. D. No. 1, Empire, Ala.
EM—Motley & Dryer, Birmingham, Ala.
MM—Edw. Sargent, R. F. D. No. 1, Empire, Ala.
SM—S. H. Dilworth, R. F. D. No. 1, Empire, Ala.
SCO—Sipsey Coal Mining Co. Store.
S of H—Mules. Track gauge 42 in.
PP—1 water tube boiler, total 50 H. P.
EMP—75. Last fiscal year output 21,000 tons.

SLIGO COAL MINING CO.
Sligo Mine; Drift; Howard Seam; 24 to 36 in. thick.
PO—Sligo, Ala.; SP—Same; CTY—Etowah; RR—N. C. & St. L., Gadsden Br.
PR—J. H. Harden.......Gadsden, Ala.
GM—J. H. Harden,......Gadsden, Ala.
MS—J. M. Smith..........Sligo, Ala.
GS—J. M. Smith, " "
PA—J. M. Smith, " "
SCO—Address the Company. Buyer, J. M. Smith, Sligo, Ala.
S of H—Mules.
S of M—Hand.
EMP—20. Last fiscal year output 8,500 tons.
Sales Agent, J. H. Harden, Gadsden, Ala.

SLOSS-SHEFFIELD STEEL & IRON CO.
General Office, Birmingham, Ala.
PR—J. C. Maben....New York, N. Y.
TR—E. L. Morris..Birmingham, Ala.
GM—J. C. Maben, Jr., " "
GS—J. G. Moore, " "
PA—W. B. Dowell, " "
SM—W. B. Dowell, " "
Fur Mgr—J. P. Dovel, " "

New Found and Brookside No. 1 Mines, Drift and slope; Nickle Plate Seam 3 ft. thick. Operate washery
PO—Brookside, Ala.; SP—Same. CTY—Jefferson. RR Sou.
MS—H. J. Thomas, ..Brookside, Ala.
SM—Clifton Pool, " "
S of H—Rope and mules. Track gauge 36 in.
S of M—Hand.
PP—2 Return tubular boilers 300 H.P.
EMP—175. Coke ovens, 185 Bee Hive type. Last fiscal year output 87,732 tons.

Crocker Hollow, Cardiff and Brazil Mines Drift; Nickle Plate, 3 ft. thick.
PO—Cardiff, Ala.; SP—Same. CTY —Jefferson. RR—Sou.
MS—H. J. Thomas, .. Brookside, Ala.
SM—Clifton Pool, " "
S of H—Mules. Track gauge 36 in.
S of M—Hand.
EMP—375. Last fiscal year output 135,538 tons.

Flat Top Mine; Slope; Mary Lee Seam, 10 ft. thick. Operate Washery.
PO—Maben, Ala.; SP—Flat Top, Ala.; CTY—Jefferson. RR—Sou.
MS—J. W. Turner......Maben, Ala.
SM—W. L. White, " "
S of H—1 steam loco., mules and rope, Track gauge 42 in.
S of M—2 Comp. air mach. and hand.
PP—2 Water tube, 7 return tubular boilers, total 1,200 H.P. 1 gen unit 110 D.C., 3 compressors and 1 pump.
EMP—500. Coke ovens, 200 Bee Hive. Last fiscal year output, 382,897 tons.

Bessie Mine, Slope; Mary Lee Seam; 7 ft. thick. Operate washery.
PO—Maben, Ala.; SP—Bessie Mines, Ala. CTY—Jefferson. RR—Sou and Frisco.
MS—W. R. Thomas, ... Maben, Ala.
MS—J. N. Holt, " "
S of H—Mules and rope. Track gauge 42 in.
S of M—25 Comp. air mach.
PP—2 Water tube, 4 return tubular boilers, total 750 H.P., 4 air compressors and 1 pump.
EMP—350. Last fiscal year output 392,302 tons.

Ivy Mine, Slope; Mary Lee Seam, 6½ ft. thick Operate washery.
PO—Dora, Ala. SP—Same. CTY—Walker. RR—Frisco.
MS—L. M. Palmer........Dora, Ala.
SM—Gordon Hagan, " "
S of H—1 Steam, 2 gasoline loco. and endless rope. Track gauge 42 in.
S of M—Hand.
PP—4 Return tubular boilers, 500 H. P..
EMP—400. Coke ovens, 200 Bee Hive. Las fiscal year output, 320,366 tons.

Drifton Mine; Drift; America Slope; 4 ft. thick.
PO—Drifton, Ala.; SP—Same. CTY—Walker. RR—Sou. Drifton Branch.
MS—Alex. Bremis, ... Drifton, Ala.
SM—W. A. Turner, " "
S of H—Mules. Track gauge 36 in.
S of M—Hand. Last fiscal year output, 65,777 tons.

SOUTH BRILLIANT COAL CO.
Parker Mine; Drift; Elk River Seam, 30 in. thick.
PO—Brilliant, Ala.; SP—Same; CTY—Marion; RR—I. C.
PR—Geo. H. Parker, Cullman, Ala.
PA—A. A. Griffith, " "
MS—J. D. Sumner, ...Brilliant, Ala.
EM—Sumter Lea, ..Birmingham, Ala.
SCO—Gihho Bros., ...Brilliant, Ala.
S of H—Mules; track gauge 36 in.
S of M—3 Comp. air mach.
PP—1 return tubular boiler, 125 H. P., 1 air comp., 1 pump.
EMP—31. Last fiscal year output 18,000 tons.
Sales Agency, Bonnyman Coal Co., Birmingham, Ala. and Nauvoo, Ala.

SOUTHERN CLAY MFG. CO.
General Office, Chattanooga, Tenn.
One Mine in Alabama, 1 mine in Tennessee.
Coaldale Mine, Drift; Black Creek Seam, 20 to 30 in. thick.
PO—R. F. D. 1, Warrior, Ala.; SP—Coaldale, Ala; CTY—Jefferson; RR—L. & N., Linton Br.
PR—W. M. Lasley, Chattanooga, Tenn.
TR—W. C. Brown, " "
GM—J. D. Harvey, " "
GS—O. S. Adams...Chattanooga, Tenn.
EM—H. Whelock.....Birmingham, Ala.
MS—W. R. Gibbs........Warrior, Ala.
SM—B. B. Hargrave.....Warrior, Ala.
S of H—Mules. Track gauge 36 in.
EMP—30. Last fiscal year output 14,000 tons. Mine coal for their own use.

SOUTHERN COAL & COKE CO.
General Office, Maylene, Ala.
Glen Carbon Mine; Slope; Gholson Seam, 36 in. thick.
PO—Glen Carbon, Ala.; SP—Same; CTY—Shelby; RR—Sou., Mobile div.
GM—G. F. Peter.......Maylene, Ala.
PA—G. F. Peter, " "
EM—G. L. Chamberlain.
MS—Wm. Kellum....Glen Carbon, Ala.
MM—S. L. Symes, " "
SM—W. L. Wooten.......Gurnee, Ala.
SCO—Southern Coal & Coke Co. Gurnee, Ala.
S of H—Mules and rope. Track gauge 36 in.
S of M—Hand.
PP—5 boilers, total 450 H. P., 2 air comp., 1 pump.
EMP—85. Last fiscal year output 54,585 tons.

Glen Carbon No. 3 Mine; Slope; Gholson Seam; 36 in thick.
PO—Gurnee, Ala.; SP—Boothton, Ala.; CTY—Shelby; RR—Sou., Blocton branch.
Just commencing development.

STITH COAL CO.
Bon Air Mine, Drift; America Seam, 30 to 50 in. thick. Operate washery.
PO—America, Ala.; SP—Lee Speer, Ala. CTY—Walker. RR—Sou., Ensley Branch.
PR—J. P. Dimmick, Montgomery, Ala.
TR—A. B. Aldridge ...America, Ala.
GM—A. B. Aldridge, " "
MS—A. B. Aldridge, " "
PA—E. P. Randle, " "
SM—E. P. Randle, " "
MM—Jas. House, " "
EM—C. F. Wheelock, Jr., Birmingham, Ala.
S of H—1 Gasoline loco. and mules. Track gauge 36 in.
S of M—Hand.
PP—1 Return tubular boiler, 80 H. P. 3 pumps.
EMP—120. Last fiscal year output 50,006 tons.

STOUT'S MOUNTAIN COAL & COKE CO.
General office, Birmingham, Ala.
Stout's Mountain Mine, Drift; Jefferson & Black Creek Seam; 3 to 4 ft. thick.
PO—Stout's Mountain, Ala.; SP —Same. CTY—Cullman. RR—L. & N.
PR—Robert Stephens, Birmingham, Ala.
TR—Z. L. Nabers, " "
GM—S. T. Stephens, Stout's Mountain, Ala.
MS—S. T. Stephens, " " "
PA—J. A. Maddow, " " "
SM—J. A. Maddow, " " "
EM—A. J. Turner..Birmingham, Ala.
S of H—Mules and 1 steam Locomotive. Track gauge, 36 in.
S of M—Hand.
(Old information.)

STUDDARD COAL CO.
Studdard Mine, Slope; Jaggers Seam, 42 in. to 60 in. thick.
PO—Kansas, Ala. SP—Carbon Hill, Ala. CTY—Walker.
PR—J. D. Studdard, .. Kansas, Ala.
MS—J. D. Studdard, " "
TR—A. Studdard, " "
S of H—Mules. Track gauge 40 in.
S of M—Hand.
PP—Boilers, total 40 H.P.
EMP—18. Last fiscal year output 8,500 tons.
Note—Idle during past year. Expect to resume shortly.

SUN LIGHT MINING CO.
Jasper, Ala. No report.

TENNESSEE COAL, IRON & RAILROAD COMPANY.
General Office,.... Birmingham, Ala.
20 Mines in Alabama and 1 mine in Tennessee.
PR—Geo. G. Crawford, Birmingham, Ala.
TR—L. T. Beecher, " "
Mine Mgr.—Edwin Ball, " "
PA—Geo. H. Gray, " "
SM—Geo. H. Gray, " "
CE—Robert Hamilton, " "
EM—N. A. Hamilton, " "
GS—Jno. F. Meagher...Pratt City, Ala.
MM—R. Faull.........Bessemer, Ala.
EE—H. M. Gassman......Ensley, Ala.
GM of Sales—F. A. Burr, and J. W. Whatley, Birmingham, Ala.
SCO—Address the Company.

Pratt No. 1, 2 and 10 Mines; Shaft and Slope.
"Pratt" Seam, 45 to 46 in. thick. Operate washery.
PO—Pratt City, Ala. SP—Shafton and Ridgefield, Ala. CTY— Jefferson. RR—Birmingham Southern.
MS—P. J. Rogers, .. Pratt City, Ala.
S of H—Electric Locomotive and rope.
S of M—Hand and Electric Machines.
PP—Boilers, gen. units, 500 volts D. C.

Pratt No. 3 Mine; Slope; Pratt Seam, 48 in. thick. Operate washery.
PO—Ensley, Ala. SP—Same. CTY—Jefferson. RR—Birmingham Sou.
MS—P. J. Rogers, .. Pratt City, Ala.
S of H—Elec. loco. and rope.
S of M—Elec. mach. and hand.
PP—6.600 volts A.C. Power from Central Station.

Pratt No. 4 Mine; Slope, Pratt Seam, 48 in. thick. Operate washery.
PO—Ensley, Ala.; SP—Same. CTY —Jefferson.
MS—J. R. Brown, ... Ensley, Ala.
S of H—Elec. loco. and rope.
S of M—Elec. mach. and hand.
PP—6,600 A.C. from Central station.

Pratt No. 5 and 8; Slope; Pratt Seam, 48 and 49 in. thick. Operate washery.
PO—Wylam, Ala.; SP—Same and Brynton, Ala. RR—Birmingham Sou.
MS—J. R. Brown.......Ensley, Ala.
S of H—Elec. loco. and rope.
S of M—Elec and hand.
PP—6,600 volts A.C. From Central station.

Pratt No. 7 and 14, Slope and drift; Pratt Seam, 48 in. thick.
PO—Pratt City, Ala.; SP—Laketon and Thompson, Ala. CTY—Jefferson. RR—Birmingham Sou.
MS—P. J. Rogers, ... Pratt City, Ala
S of H—Elec. loco., mules and rope.
S of M—Hand.
PP—500 volts D.C.

Docena Mine, Shaft; Pratt Seam, 42 in. thick.
PO—Adamsville, Ala., R. D. No. 4 SP Docena, Ala. CTY—Jefferson. RR—Birmingham Sou.
MS—W. H. Stirling, Adamsville, Ala.
S of H—Elec.
S of M—Elec. and hand.
PP—250 volts D. C.

Edgewater Mine; Shaft; Pratt Seam, 52 in. thick.
PO—Wylam, Ala.; SP—Edgewater, Ala. CTY—Jefferson. RR—Birmingham Sou.
MS—J. M. McHugh, ... Wylam, Ala.
S of H—Elec.
S of M—Elec and hand.
PP—250 volts D.C.

(Continued on Next Page.)

Tennessee Coal, Iron & Railroad Co.—Cont.
Blue Creek Nos. 3 and 4; Slope; Blue Creek Seam, 80 to 82 in. thick. Operate washery.
PO—Johns, Ala. SP—Same and Sumter, Ala. CTY—Jefferson. RR—L. & N.
MS—H. M. Byars, ... Johns, Ala.
S of H—Mules and rope.
S of M—Hand.
PP—250 and 500 volts D.C.

Blue Creek Nos. 5 and 6; Slope; Blue Creek Seam, 84 in. thick.
PO—Johns, Ala.; SP—Adger and Apache, Ala. CTY—Jefferson. RR—L. & N.
MS—H. M. Byars, ... Johns, Ala.
S of H—Mules and rope.
S of M—Hand.

Blocton Nos. 2, 3, 7 and 8; Slope; Thompson Seam, 66 to 70 in. thick.
PO—Blocton, Ala.; SP—Same. CTY—Bibb. RR—L. & N., W. & B.; A. G. S. Sou., M & O.
MS—James Stewart, .. Blocton, Ala.
S of H—Mules and rope.
S of M—Hand.
PP—2,300 volts A.C.

Blossburg "A" "B" and "E"; Drift; Pratt Seam, 42 in. thick. Operate washery.
PO—Blossburg, Ala.; SP—Same. CTY—Jefferson. RR—Sou.
MS—Harry McCrarie....Blossburg, Ala.
S of H—Mules.
S of M—Hand.
EMP—At all mines, 3,837. Last fiscal year output at all mines 3,358,354 tons. Total number of coke ovens at all mines, Bee Hive, 2,974; By-Product, 280.

THOMASSON, J. M.
See Glen Mary Coal Co.

TUSCALOOSA MINING CO.
Tuscaloosa Mine; Drift; America Seam.
PO—Oakman, Ala.; SP—Same; CTY—Walker; RR—Sou.
GM—George B. Hooper..Oakman, Ala.
PA—George B. Hooper, " "
EM—Hooper Collier, " "
MS—S. A. Robbins, " "
S of H—Mules.
S of M—Hand.
EMP—30.
Note—Not operating at present.

TUSCALOOSA EXPORT COAL CO.
General Office, Birmingham, Ala.
Gilmore Mine, Drift, Brookwood Seam, 4 ft. 8 in. to 5 ft. 4 in. thick. Operate washery.
PO—Cottondale, Ala., R.F.D. No; 2. SP—Shiras. CTY—Tuscaloosa. RR—L. & N., Warrior River Branch.
PR—W. J. Gilmore, Birmingham, Ala.
TR—M. R. Gilmore, " "
PA—R. M. Gilmore, " "
GM—A. J. Gilmore, " "
MS—A. J. Gilmore, " "
SB—R. M. Gilmore, " "
SM—A. M. Duncan, Cottondale, Ala., R.F.D. No. 2.
EM—J. D. Walker, East Lake, Ala.
S of H—Mules and Steam. Track gauge 40 in.
S of M—Hand.
EMP—96.
Idle for past year; expect to resume shortly.

VULCAN SUPPLY CO.
General Office, Coal City, Ala.
PR—H. N. Van Devander, Cedartown, Ga.
TR—H. N. Van Devander, " "
EM—H. N. Van Devander, " "
GM—C. R. Fay........Coal City, Ala.
PA—C. R. Fay, " "

Smith Mine; Slope; Eureka Seam; 36 to 48 in. thick.
PO—Coal City, Ala.; SP—Same; CTY—St. Clair; RR—S. A. L.
MS—W. W. Wilson.....Coal City, Ala.
S of H—Rope. Track gauge 36 in.
S of M—Hand.
PP—2 return tubular boilers, total 80 H. P., 1 engine, 2 pumps.
EMP—30. Last fiscal year output 17,000 tons.

Pike Mine; Slope; Marion Seam; 26 to 30 in. thick.
PO—Coal City, Ala.; SP—Same; CTY—St. Clair; RR—S. A. L.
MS—E. L. Pike.......Coal City, Ala.
S of H—Rope. Track gauge 36 in.
S of M—Hand.
PP—1 return tubular boiler, total 50 H. P., 1 engine, 1 pump.
EMP—20. Last fiscal year output 3700 tons.

Vulcan Mines Nos. 1, 3, 6; Slopes; Eureka and Rutelia Seams; 26 to 48 in. thick.
PO—Coal City, Ala.; SP—Same; CTY—St. Clair; RR—S. O. L.
MS—W. W. Wilson, Coal City, Ala.
S of H—Mules and rope. Track gauge 36 in.
S of M—Hand.
PP—1 water tube boiler, 3 return tubular boilers, total 200 H. P., 4 pumps.
EMP—50. Last fiscal year output 20,777 tons.
Note—Formerly operated by Branch Coal Co.

WADSWORTH-CAHABA COAL CO.
Out of business.

WALKER COUNTY COAL CO.
Bankrupt.

WARALA COAL COMPANY.
General Office, Reading, Pa.
Borden Mine, Drift, America Seam, 2 ft. 6 in. to 4 ft. 6 in. thick.
PO—Drifton, Ala.; SP—Same. CTY—Walker. RR—Southern, Enslee Branch.
PR—Frank J. Boyer,.. Reading, Pa.
TR—Geo. Speer, ... Bangor, "
GM—J. H. Boyer, ... Drifton, Ala.
SM—Geo. R. Browne, " "
S of H—Mules. Track gauge 36 in.
S of M—Hand.
EMP—60.
—Note—Mine not operated during past year on account of business depression.

WARRIOR BLACK CREEK COAL CO.
Nyota Nos. 1, 2 and 3 Mines; Drift, "Black Creek" Seam, 28 to 40 in. thick. Operate washery.
PO—Warrior, Ala.; SP—El Vista, Ala.; CTY—Jefferson. RR—L. & N., Linton Branch.
PR—G. B. McCormack, Birmng'hm, Ala
TR—C. L. Moss, ... Warrior, "
GM—C. L. Moss, " "
PA—C. L. Moss, " "
MS—Fred. Moss, " "
SCO—Nyota Store, " "
Buyer, C. S. Fletcher, " "
S of H—Mules and 2 steam locomotives. Track gauge 36 in.
S of M—Hand.
EMP—150. Last fiscal year output, 62,000 tons. Sales agent, D. H. Brown & Co., Birmingham, Ala.

WARRIOR PRATT COAL CO.
General Office, Birmingham, Ala.
Porter Mine, Slope, Mary Lee Seam.
PO—Porter, Ala.; SP—Same; CTY—Jefferson; RR—Sou.
PR—Daniel Pierson, Jr., Birmingham, Ala.
TR—Harold R. Sanson, " "
GM—Harold R. Sanson, " "
PA—Geo. C. Walter, " "
EM—A. H. Witt, " "
MS—Dan McDevitt........Porter, Ala.
SM—E. B. Fikes, " "
S of H—Rope and mules.
S of M—Hand and 15 comp. air mach.
PP—4 Atlas boilers, total 600 H. P., 2 comp. and 4 pumps.

WARRIOR RIVER COAL CO.
See Brookside-Pratt Mining Co.

WEST CORONA COAL CO.
Leased to Chabert Coal Co.

WIDOWS CREEK COAL CO.
Montague Mine.
PO—Bridgeport, Ala.; SP—Same; CTY—Jackson.
Note—Mine closed down.

WOODWARD IRON CO.
General Office, Woodward, Ala.
PR—Jos. H. Woodward, Birmingham, Ala.
GS—B. E. Purser......Dolomite, Ala.
ASST TO VPR—J. J. Shannon, Woodward, Ala.
TR—D. E. Wilson, " "
PA—Herbert E. Smith, " "
MM—J. D. Gaboury, " "
EE—E. P. Winters, " "
SM—J. H. Leonard, " "
EM—A. F. Harper......Mulga, "
Dolomite Nos. 1 and 2 Mines; Slope, Pratt Seam, 4½ ft. thick.
PO—Dolomite, Ala.; SP—Same; CTY—Jefferson; RR—A. B. & A.
MS—B. E. Purser......Dolomite, Ala.
S of H—Elec. locos.
S of M—Hand.
EMP—720. Last fiscal year output 623,565 tons.

Mulga No. 1 Mine; Shaft; Pratt Seam 3½ ft. thick.
PO—Mulga, Ala.; SP—Same; CTY—Jefferson; RR—A. B. & A.
MS—B. E. Purser.......Dolomite, Ala.
S of H—Elec. locos.
S of M—Mach.
EMP—395. Last fiscal year output 255,606 tons.

YOLANDE COAL & COKE CO.
General Office, Birmingham, Ala.
Yolande Mine.
PO—Yolande, Ala.; SP—Same; CTY—Tuscaloosa; RR—L. & N.
PR—J. B. McClary, Birmingham, Ala.
GM—J. B. McClary, " "
PA—J. B. McClary, " "
TR—E. J. Rowe, " "
MS—D. E. Morrow.....Yolande, Ala.
EM—D. E. Morrow, " "
SM—T. W. Moore, " "
EMP—400. Coke ovens, 100 Bee Hive. Last fiscal year output, 158,038 tons.
Sales agent, E. J. Rowe, Birmingham, Ala.

ARKANSAS

For List of Abbreviations See Page 622.

ARKANSAS VALLEY COAL CO.
Porter Mine, Slope, Hartshorne Seam, 36 to 42 in. thick.
PO—Hacket, Ark.; SP—Same; CTY—Sebastian; RR—M. V.
GM—Wm. C. Caudle.....Hackett, Ark.
PA—Wm. C. Caudle, " "
MS—Wm. C. Caudle, " "
CE—Wm. C. Caudle, " "
EM—A. D. Porter, " "
S of H—Mules and rope.
S of M—Hand.
PP—1 Nagle return tubular boiler, 60 H. P.; 1 gen. unit.
EMP—45. Last fiscal year output, 10,000 tons. Sales Agentcy, Wm. C. Caudle, Hackett, Ark.

CENTRAL ANTHRACITE COAL CO.
Central Mine.
PO—Clarksville, Ark.; No report.

CENTRAL COAL & COKE CO.
General Office, Kansas City, Mo. 7 mines in Arkansas, 9 in Kansas, 3 in Missouri, 3 in Wyoming, and 2 in Oklahoma.
PR—Charles S. Keith, Kansas Cty, Mo.
VP—Harry N. Taylor..Kansas City, Mo.
PA—Thos. Mackie....Kansas City, Mo.
GS—Wm. Harkes, " "
CE—J. C. Flaherby, " "

Nos. 2 and 3 Mines; Shaft and drift; Hart Seam.
PO—Huntington, Ark. SP—Same. CTY Sebastian. RR—Frisco.
MS—D. H. Cadmus....Huntington, Ark.
S of H—Rope and 36 elec. locos.
S of M—Hand and 5 elec. mach.
PP—8 boilers.
EMP—560..

No. 6 Mine; Shaft, Hart Seam.
PO—Huntington, Ark. SP—Same CTY—Sebastian. RR—Frisco.
MS—D. H. Cadmus....Huntington, Ark.
S of H—Mules.
S of M—Hand and 4 elec. mach.
PP—4 boilers.
EMP—492.

Nos. 4 and 10 Mines; Slopes; Hart Seam.
PO—Huntington, Ark. SP—Hartford, Ark.; CTY—Sebastian. RR—C.R.I. & P.
MS—M. McMorrow.......Hartford, Ark.
S of H—Mules and rope.
S of M—Mach.
PP—4 boilers.

CLARK, McWILLIAMS & COMPANY
General Office, Spadra, Ark.
Black Diamond Mine; Shaft; Anthracite Seam; 48 in. thick.
PO—Spadra, Ark.; SP—McWilliams' Spur, Ark.; CTY—Johnson; RR—Mo. Pac.
GM—T. M. Clark........Spadra, Ark.
PA—T. M. Clark " "
MS—T. M. Clark, " "
SM—T. M. Clark, " "
GS—N. R. Clark, " "
EM—Robt. Miller.......Hartman, Ark.
MM—C. R. Middaugh, " "
S of H—1 gasoline loco. and 1 storage battery. Track gauge 36 in.
S of M—Hand.
PP—1 water tube and 1 return tubular boiler, total 200 H. P.
EMP—150. Last fiscal year output, 400,000 tons.

CORONADO COAL COMPANY.
Receiver, A. S. Dowd, Fort Smith, Ark.
General Office, Fort Smith, Ark.
Coronado No. 1, Shaft; Lower Hartshorne Seam; operate washery.
PO—Midland, Ark.; SP—Same; CTY—Sebastian; RR—Frisco.
PR—F. Bache........Ft. Smith, Ark.
VP—C. H. Finley, " "
TR—E. D. Joyner, " "
GS—J. S. Cameron ....Midland, Ark.
S of H—Mules and rope.
S of M—Hand.
Sales Agent, McAlester Fuel Co., McAlester, Okla.

DALLAS COAL CO.
Dallas Nos. 4 and 8 Mines, Shaft and 5 drifts, Hartshorne, Seam 34 to 48 in. thick.
PO—Huntington, Ark.; SP—Burnea, Ark.; CTY—Sebastian; RR—St. Louis & San Francisco, Mansfield Br.
PR—J. E. Finney.....Huntington, Ark.
TR—L. E. Turner, " "
GM—L. E. Turner, " "
PA—L. E. Turner, " "
MS—A. Bair.........Huntington, Ark.
S of H—Mules, rope and 1 steam loco., track gauge 28 in.
S of M—Hand.
PP—1 Water tube boiler, total 100 H. P.. 1 pump.
Note—Idle during past year.

DODSON, GEORGE E. COAL CO.
PR—George E. Dodson,.......Alix, Ark.
TR—George E. Dodson, " "
GS—George E. Dodson, " "
PA—George E. Dodson, " "
MM—Arthur McDonald, " "
SM—Bertha T. Dodson, " "
EM—Wilber Ruhl,.....Fort Smith, Ark.
SCO—George E. Dodson, Genl. Mdse.

Dodson No 1 Mine; Shaft; Ark. Semi-Anthracite Seam; 40 to 48 in. thick.
PO—Alix, Ark.; SP—Denning Yards; CTY—Franklin; RR—Mo. Pacific.
S of H—Mules, rope and 1 steam loco. Track gauge 36 in.
PP—2 boilers, total 200 H P., 2 pumps, 1 air comp.
EMP—60. Last fiscal year output 16,834 tons.

Dodson No. 2 Mine; Shaft; Ark. Semi-Anthracite Seam; 40 to 48 in. thick.
PO—Alix, Ark.; SP—Denning Yards; CTY—Franklin; RR—Mo. Pacific.
S of H—Mules. Track gauge 36 in.
PP—1 return tubular boiler, total 85 H. P., 1 pump.
EMP—60. Last fiscal year output 20,312 tons.

EUREKA MINING CO.
Eureka Mine; Shaft, Spadra Seam; 36 to 48 in. thick.
PO—Clarksville, Ark.; SP—Spadra, Ark.; CTY—Johnson; RR—Mo. Pac.
PR—H. L. Mardis....Clarksville, Ark.
TR—E. J. Mardis, " "
GM—E. J. Mardis, " "
PA—E. J. Mardis, " "
MS—E. J. Mardis, " "
SCO—Needmore-Pigg Merc. Co. Buyer, E. J. Mardis, Clarksville, Ark.
S of H—Mules and rope. Track gauge 34 in.
S of M—Hand.
PP—2 Return tubular boilers, total 180 H. P., 3 pumps.
EMP—100. Last fiscal year output 12,425 tons. Sales agency, Spadra Clarksville Coal Co., Spadra, Ark.

GRAND COAL COMPANY.
Grand Mine; Shaft; Paris Seam; 24 to 32 in. thick.
PO—Paris, Ark; SP—Same; CTY—Logan; RR—Mo. Pacific, Ark. Central branch.
PR—John D. Deen,......Paris, Ark.
TR—Chas. L. Wahl, " "
GM—Chas. L. Wahl, " "
PA—Chas. L. Wahl, " "
MS—John Shaffer, " "
MM—Chas. Wahl, Jr. " "
SCO—John Brothers, buyer, Chas. L. Wahl, Paris, Ark.
S of H—Mules, rope and steam. Track gauge 28 in.
S of M—Hand.
PP—2 Return tubular boilers, total 100 H. P., 2 pumps.
EMP—70. Last fiscal year output, 19,600 tons.
Note—Successors to Standard Coal Co.

GREENWOOD COAL CO.
Gunther No. 2 Mine; Slope; Semi-Anthracite Seam; 5 to 8 ft. thick.
PO—Greenwood, Ark.; SP—Same; CTY—Schastian; RR—Midland Val.
PR—A. P. Gunther....Greenwood, Ark.
GM—A. P. Gunther, " "
TR—M. E. Gunther, " "
GS—R. A. Young, " "
MS—C. N. Alexander, " "

(Continued on Next Page.)

PA—Frank Gunther....Greenwood, Ark.
CE—H. O. Lewis, " "
EM—H. O. Lewis, " "
MM—M. C. Mathews, " "
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—3 boilers, 1 air comp.; 4 pumps.
EMP—185. Last fiscal year output 120,000 tons.
Sales Agent, Star Coal Co., Kansas City, Mo.
Note—Idle at present.

HARPER COAL & COKE CO.
Harper Mine, Slope, Hartshorne Seam 40 to 44 in. thick.
PO—Bates, Ark.; SP—Same; CTY—Scott; RR—K. C. So.
PR—I. R. Packard.......Bates, Ark.
GM—I. R. Packard, " "
PA—I. R. Packard, " "
MS—I. R. Packard, " "
TR—C. P. Wilson....Fort Smith, Ark.
SCO—I. R. Packard Mdse. Co., buyer I. R. Packard, Bates, Ark
S of H—Rope; track gauge 36 in.
S of M—Hand.
PP—2 Water tube boilers, total 180 H. P., 1 gen. unit, 2 pumps.
EMP—80. Last fiscal year output 200 tons per day.

HARTFORD COAL CO.
Receiver, A. S. Dowd, Fort Smith, Ark.
General Office, Fort Smith, Ark.
No. 1 Mine; Slope; Hartshorne Seam.
PO—Midland, Ark.; SP—Same; CTY—Sebastian; RR—Midland Valley.
GM—F. Bache ......Fort Smith, Ark.
MS—H. P. Sweeney......Midland, Ark.
S of H—Mules and rope.
S of M—Hand.
PP—Boiler 125 H. P.
EMP—75.

HIAWATHA SMOKELESS COAL CO.
Coaldale Mine; Slope.
PO—Greenwood, Ark.; SP—Same; CTY—Sebastian; RR—Arkansas & Western.
GM—R. A. Young....Greenwood, Ark.
PA—R. A. Young, " "
MS—R. A. Young, " "
S of H—Mules and rope.
S of M—Hand.
PP—2 Boilers total 250 H. P.
EMP—60.

McKINNEY COAL CO.
Sunshine Mine; Shaft; Spadra Seam; 36 to 44 in. thick.
PO—Montana, Ark.; SP—Spadra; CTY—Johnson; RR—S. L. I. M. & S.
GM—D. A. McKinney....Montana, Ark.
PA—D. A. McKinney, " "
MS—D. A. McKinney, " "
S of H—Mules and rope. Track gauge 36 in.
S of M—Hand.
PP—2 Houston Stanwood & Gamble return tubular boilers, 2 pumps;
EMP—30. Last fiscal year output 3,420 tons Sales agent, McAlester Fuel Co., McAlester, Okla.

McWILLIAMS, WARD & CO.
See Clark McWilliams & Co.

MAMA COAL CO.
No. 17½ Mine; Slope; Bituminous Seam, 60 to 84 in. thick.
PO—Jenny Lind, Ark.; SP—Same; CTY—Sebastian; RR—Iron Mountain. Greenwood branch.
PR—J. L. Henson....Jenny Lind, Ark.
TR—W. K. Leyden, " "
MS—W. K. Leyden, " "
S of H—Mules, track gauge 36 in.
S of M—Hand.
PP—1 boiler, 85 H. P.
EMP—87. Last fiscal year output 35,810 tons.

MAMMOTH VEIN COAL CO.
Receiver, A. S. Dowd, Fort Smith, Ark.
General Office, Fort Smith, Ark.
Mammoth Vein Nos. 1 and 6 Mines Slope and Shaft; Lower Hartshorne Seam; 7 to 10 ft. thick.
PO—Midland, Ark.; SP—Same; CTY—Sebastian; RR—Midland Valley and Rock Island.
PR—F. Bache........Ft. Smith, Ark.
VP—C. H. Finley " "
TR—E. P. Jayner, " "
GS—J. S. Cameron......Midland, Ark.
S of H—Mules and rope.
S of M—Hand and 2 comp. air mach.
Sales Agent, McAlester Fuel Co., McAlester, Okla.

MAYER COAL CO.
1 Mine in Arkansas, 8 in Kansas.
Fidelity No. 10 Mine, Slope, Semi-Anth-

PO—Greenwood, Ark.; SP—Same; CTY—Sebastian; RR—Midland Valley.
PR—John Mayer.....Kansas City, Mo.
GM—John Mayer, " " "
TR—J. C. Spurgeon...Kansas City, Mo.
PA—R. I. McGregor, " " "
GS—Joseph Humble, R. D. No. 1, Pittsburg, Kas.
EM—C. E. Welch, R. D. No. 1, Pittsburg, Kas.
EE—Sam Cunningham, R. D. No. 1, Pittsburg, Kas.
S of H—Mules; track gauge 42 in.
S of M—Hand.
PP—4 Return tubular boilers, total 400 H. P., 2 Air comp., 4 pumps.
Sales Agent, R. I. McGregor, Kansas City, Mo.

MERCK & SPAINLOUR.
Star Mine.
PO—Paris, Ark. No report.

MIDLAND SIX COAL CO.
General Office, Midland, Ark.
Midland-six Mine; slope and shaft; Midland-Burma seam; 36 to 40 in.
PO—Midland, Ark.; SP—Same; CTY—Sabastin; RR— M. V. and St. L. & S. F.
PR—J. E. Finney, ...Poteau, Okla.
GM—J. E. Finney .... Midland, Ark.
PA—J. E. Finney " "
TR—M. A. Finney ......Liberty, Mo.
CE—T. A. Freeze........Midland, Ark.
MS—H. E. Carruth, " "
MM—Thos. Patterson, " "
EE—F. C. Finney, " "
SCO—Midland Supply Co. Buyer, A. S. Johnson, Midland, Ark.
S of H—Mules.
S of M—Hand.
PP—3 return tubular boilers. Total 250 H. P., 1 comp., 2 pumps.
EMP—150.

NEW UNION COAL COMPANY.
New Union Coal Co. Mine; Slope; Semi-Anthracite Seam; 25 to 28 in. thick.
PO—Paris, Ark.; SP—Same; CTY—Logan; RR—A. C.
PR—H. S. Foster, ...Paris, Ark.
TR—Geo. M. Zeller, Sr. " "
GM—H. S. Foster " "
GS—H. S. Foster " "
PA—Geo. M. Zeller " "
MM—B. Cleary " "
SCO—Geo. M. Zeller Co. " "
S of H—Elec. loco. Track gauge 36 in.
S of M—Hand; 6 comp. air mach.
PP—2 return tubular boilers, 150 H. P., 1 air compressor, 1 pump.
EMP—50. Daily output, 100 tons.

PACKARD CONSOLIDATED COAL CO.
Packard Mine; Slope; Bates Seam, 6 ft. thick.
PO—Bates, Ark.; SP—Same; CTY—Scott; RR—K. S., Sou.
MS—I. R. Packard........Bates, Ark.
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—Boiler 60 H. P.
EMP—45. Output 100 tons daily.

PARIS COAL CO.
Pendleton Mine; Shaft; Paris Seam, 30 to 32 in. thick.
PO—Paris, Ark; SP—Same; CTY—Logan; RR—Ark. Central.
PR—Martin Theurer, Fort Smith, Ark.
GM—Anthony Hall........Paris, Ark.
PA—Anthony Hall, " "
GS—Anthony Hall, " "
MS—J. E. Daniel, " "
S of H—Mules; track gauge 36 in.
S of M—6 Comp. air mach and hand.
PP—2 Water tube boilers, total 120 H. P., 1 comp. and 1 pump.

PENNSYLVANIA MNG. CO.
General Office, Scranton, Pa.
Fernwood Mine, Shaft, Spadra Seam 36 in. thick.
PO—Clarksville, Ark. SP—Same. CTY Johnson. RR—M. P., St. L. I. M. & S.
PR—James K. Gearhart..Scranton, Pa.
TR—W. H. Gearhart .. " "
GM—Fremont Stokes...Clarksville, Ark.
MS—Fremont Stokes ... " "
EM—R. M. Eyster..... " "
PA—E. M. Eyster, " "
S of H—Mules. Track gauge 42 in.
S of M—3 elec. machines and hand.
PP—2 return tubular boilers, total 250 H. P., 1 gen. unit, 250 volts D. C., 1 pump.
EMP—200. Last fiscal year output 49,391 tons.
Sales agent, McAlester Fuel Co., McAlester, Okla.

PHOENIX COAL & MINING CO
No. 1 Mine: Slope and strip; Hartshorne Seam, 36 to 84 in. thick.
PO—Huntington, Ark.; SP—Arksol, Ark.; CTY—Sebastian; RR—St. L. & S. F.
PR—C. A. Beggs, Huntington, Ark.
GS—C. A. Beggs, " "
MS—C. A. Beggs, " "
TR—L. E. Lake, " "
PA—L. E. Lake, " "
EM—H. O. Lewis, Ft. Smith, Ark.
S of H—Mules; track gauge, 32½ in.
S of M—Hand.
PP—Power from central plant, 110-440 volts A. C., 3 phase 60 cycles.
EMP—50.
Output, 15,000 tons.
Sales Agency, McAlester Fuel Co., McAlester, Okla.

PRAIRIE CREEK COAL MINING CO.
Receiver, A. S. Dowd, Fort Smith, Ark.
General Office, Fort Smith, Ark.
No. 4 Prairie Creek Mine, Shaft and Slope; Lower Hartshorne.
PO—Midland, Ark.; SP—Same; CTY—Sebastian; RR—Midland Valley.
PR—F. Bache........Ft. Smith, Ark.
TR—E. P. Jayner, " "
VP—C. H. Finley, " "
GS—J. S. Cameron......Midland, Ark.
S of H—Rope and mules.
S of M—Hand and elec. mach.
Sales Agent, McAlester Fuel Co., McAlester, Okla.

SCHMIDT-BLAKELY COAL COMPANY.
Schmidt-Blakely Mine, Shaft; Hartshorne Seam; 36 to 52 ins. thick.
PO—Coal Hill, Ark.; SP—Denning Yards, and Coal Hill, Ark.; CTY—Johnson; RR—I. M. S.
PR Charles Schmidt, 1200 N. 11th St., Ft. Smith, Ark.
TR—R. A. Schmidt,....Coal Hill, Ark
GM—R. A. Schmidt, " "
PA—R. A. Schmidt, " "
MS—R. A. Smith, " "
S of H—Mules and rope; track guage 36 in.
S of M—Hand.
PP—2 Return tubular boilers total 180 H. P., 2 comp., 3 pumps.
EMP—25. Last fiscal year output 15,000 tons.
Note—Mine flooded during greater part of year. Work just resumed.

SMOKELESS ANTHRACITE COAL CO.
Duck Nest Mine; Shaft; Semi-Anthracite Seam; 34 to 39 in. thick.
PO—Spadra, Ark.; SP—Same; CTY—Johnson; RR—I. M. S.
PR—J. E. James.....Clarksville, Ark.
GM—J. E. James " "
MS—J. E. James, " "
EM—W. N. Cunningham, " "
MM—W. N. Cunningham " "
TR—George Heim.......Scranton, Ark.
PA—George Heim, " "
S of H—Mules.
S of M—Hand..
PP—Three pumps, 125 total H. P.
EMP—50. Output for 3 months, 8,182 tons. Sales Mgr., George Heim, Scranton, Ark.

SOUTHERN ANTHRACITE COAL MINING CO
Bernice Mine; Shaft; Shinn Basin Seam, 24 to 30 in. thick.
PO—Russellville, Ark.; SP—Bernice, CTY—Pope; RR—D. & R.
PR—J. G. Puterbaugh, McAlester, Okla.
TR—H. P. Ady........Russellville, Ark.
PA—Lee McDowell; " "
SM—A. Y. Hayes, " "
GS—Lee McDowell, " "
MM—Lee Kersey, " "
EE—Lee Kersey, " "
MS—Chess McDowell, " "
SCO—Address the company.
S of H—Steam gasoline and elec. hoists, rope and mules.
S of M—Hand.
PP—3 Heine water tube boilers, gen. units, 220 volts A. C., 60 phase. Power purchased.
EMP—250. Last fiscal year output 76,978 tons.

SPADRA CREEK COAL CO.
Spadra Creek Mine; Shaft; Spadra Seam, 36 to 42 in. thick.
PO—Clarksville, Ark.; SP—Spadra, Ark.; CTY—Johnson; RR—Mo. Pac.
PR—C. M. Jackman....Witchita, Kan.
TR—P. P. Mardis......Clarksville, Ark.
GM—P. P. Mardis, " "
PA—P. P. Mardis, " "
EM—P. P. Mardis, " "
MS—Robert Griffith, " "
S of H—Mules and rope track gauge 36 in.
S of M—Hand.
PP—2 Return tubular boilers, total 180 H. P., 1 pump.
EMP—95. Last fiscal year output 15,000 tons. Sales agency, Spadra Clarksville Coal Co.

STANDARD COAL CO.
See Grand Coal Co.

STERLING ANTRACITE COAL CO.
Sterling Mine; Spadra Seam, 30 to 36 in. thick.
PO—Clarksville, Ark.; SP—Same; CTY—Johnson; RR—St. L. I. M. & S.
PR—Max Heiman, Little Rock, Ark.
TR—J. E. Nichols, Clarksville, Ark.
GM—J. E. Nichols, " "
PA—J. E. Nichols, " "
GS—J. B. King, " "
SCO—Alvin Laser & Co., " "
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—Boiler, 100 H. P., 3 gen. units, 1 pump.
EMP—100. Output 25,000 tons.

TURNIPSEED COAL CO.
Drift Mine; Semi Anthracite Seam; 36 in. thick.
PO—Midland, Ark.; SP—Same; CTY—Sebastian; RR—Frisco.
PR—C. C. Turnipseed...Midland, Ark.
TR—C. C. Turnipseed, " "
GM—C. C. Turnipseed, " "
S of H—Mules.
EMP—14. Last fiscal year output 5,000 tons.

WEST COAL CO.
PO—Coal Hill, Ark. No report.

WESTERN COAL & MINING CO.
General Office, St. Louis, Mo.
3 Mines in Arkansas, 8 Mines in Kan. 1 Mine in Illinois, 6 Mines in Missouri.
PR—W. J. Jenkins......St. Louis, Mr.
TR—F. M. Hinkman....St. Louis, Mo.
GM—W. J. Jenkins, " "
GS—J. H. Shaw, " "
PA—D. Simpson, " "
EM—C. L. Moorman, " "
SCO—J. L. Worrall, " "

No. 2 Mine; Shaft; Seam 3 ft. 10 in. thick.
PO—Denning, Ark; SP—Same; CTY—Franklin; RR—I. Mtn.
MS—D. M. McGraw.....Denning, Ark.
S of H—Elec. loco. and mules.
S of M—Hand.

Nos. 17 and 18 Mines; Shaft; Seam, 4 ft. thick.
PO—Jenny Lind, Ark.; SP—Same; CTY—Sebastian; RR—I. Mtn.
MS—H. L. Adams....Jenny Lind, Ark.
S of H—Mules and elec.
S of M—Hand.

WOODSON COAL CO.
Woodson Mine; Slope; Hartford Seam, 42 to 54 in. thick.
PO—Hartford, Ark.; SP—Same; CTY—Sebastian; RR—M. V.
PR—C. C. Woodson....Huntington, Ark.
TR—C. C. Woodson, " "
GM—C. C. Woodson, " "
PA—C. C. Woodson, " "
GS—Chas. Woodson.....Hartford, Ark.
MS—Chas. Woodson, " "
SCO—B. L. Woodson Co.
S of H—Mules; track gauge 3 ft.
S of M—Hand.
PP—3 Return tubular boilers, total 290 H. P., 3 pumps.
EMP—62. Last fiscal year output 25,114 tons.

WOODSON-BARR COAL CO.
No. 135 Mine; Slope; Semi-Ant. Seam; 48 to 78 in. thick.
PO—Bonanza, Ark.; SP—Same; CTY—Sebastian; RR—Frisco.
PR—R. J. Barr.........Bonanza, Ark.
TR—John Barr, " "
GM—John Barr, " "
MS—R. J. Barr, " "
S of H—Mules.
S of M—Hand.
PP—2 Boilers, 100 H. P., and 3 pumps.
EMP—100. Last fiscal year output 63.000 tons.

CANADA

For List of Abbreviations See Page 622.

ACADIA COAL COMPANY, LTD.
General Office, Stellarton, Nova Scotia.
PR—Sir Montag Allan..Montreal, P. Q.
TR—Hector Prudhomme, Stellarton, N. S.
GM—Hector Prudhomme, " "
PA—Geo. Gray, " "
Chief EM—F. E. Notebaert, " "
ME—T. F. Courthope, " "
EE—E. L. Marth l.ur, " "
SCO—Central Store. Buyer, George Gray, Stellarton, N. S.

Allan Mine; Shaft; Foord and Cage Seam; 168 to 480 in. thick.
PO—Stellarton, N. S., SP—Same; CTY—Pictou; RR—I. R. C.
MS—M. Beaton.......Stellarton, N. S.
SM—Q. S. Mitchell, " "
S of H—Mules, comp. air and 1 steam loco. Track gauge 36 in.
S of M—6 comp. air mach.
PP—6 Babcock & Wilcox water tube boilers, total 2700 H. P., two 1500 K. W. turbo-generators, 3150 volts, A. C., 3 phase, 50 cycle, 2 air comp., 2 pumps.
EMP—468. Last fiscal year output 340,975 tons.

Albion Mine; Slope; Ford, Cage and Third Seam; 180 to 420 in. thick.
PO—Stellarton, N. S., SP—Same; CTY—Pictou; RR—I. R. C.
MS—John Higson.....Stellarton, N. S.
SM—Q. S. Mitchell, " "
S of H—Mules, comp. air and 1 steam loco.
S of M—3 comp. air mach.
PP—1 Stirling water tube boiler, total 500 H. P. Receives power from Allan Mine. 2 air comp.
EMP—400.

McGregor Mine; Slope; 120 to 168 in. thick.
PO—Stellarton, N S.; SP—Same; CTY—Pictou; RR—I. R. C.
Mine Mgr—S. Moso....Stellarton, N. S.
SM—Q. S. Mitchell, " "
S of H—Mules and comp. air.
S of M—9 comp. air mach.
PP—2 air compressors, 2 pumps.
EMP—476.

ALBERTA COAL MINING COMPANY, LTD.
Alberta Mine, Slope; Seam 6 to 12 ft.
PO—Cardiff, Alta.; SP—Same; RR—Canadian Northern, Athaboska Br.
PR—Jas. L. Bell,
B. N. A. Book Bldg., Edmonton, Alta.
TR—Geo. S. Montgomery,
B. N. A. Book Bldg., Edmonton, Alta.
GM—Geo. S. Montgomery,
B. N. A. Book Bldg., Edmonton, Alta.
PA—Geo. S. Montgomery,
B. N. A. Book Bldg., Edmonton, Alta.
MS—E. S. Bishop......Cardiff, Alta.
SM—E. S. Bishop, " "
CE—David Jones......Edmonton, Alta.
EM—David Jones, " "
S of H—Mules. Track gauge 32 in.
S of M—Hand.
PP—2 Boilers total 130 H. P.
EMP—108. Last fiscal year output 60,937 tons. Sales agent, Great Northern Coal Co., Edmonton, Alta.

BANKHEAD MINES, LTD.
General Office, Montreal, Que.
Bankhead Mine, Drift.
PO—Bankhead, Alta.; SP—Same; RR—C. P.
PR—R. B. Angus....Montreal, Que.
SECY—A. R. G. Heward, " "
TR—B. T. Coon, " "
GS—Louis Stockett ....Calgary, Alta.
..**SUPT**—D. E. Wilson....Bankhead, Alta.
MS—John Watters, " "
EM—R. Dougall, " "
MM—D. Smith, " "
S of H—Comp. air.
PP—110 Volts, A. C., 12 Boilers, total 1600 H. P.
EMP—500.

BATHURST COAL COMPANY, LTD.
Out of business.

BATTLE RIVER COLLIERIES.
General Office, Rosenroll, Alta.
Battle River Mine; Shaft; Edmonton, Lignite Seam, 78 to 96 in. thick.
PO—Rosenroll, Alta.; SP—Ohaton, Alta.; RR—C. P.
PR—A. S. Rosenroll......Wetaskiwin.
TR—A. S. Rosenroll, "
GM—C. G. Stacey...........Saskatoon
EM—Norman Fraser....Edmonton, Alta.
MM—W. B. Halladay...Rosenroll, Alta.
S of H—Mules.
S of M—3 Comp. air mach.
PP—3 Return tubular boilers, total 210 H. P., 1 compressor, 2 pumps.

BIG VALLEY COLLIERIES, LTD.
Drift Mine; Flat Seam, 72 in. thick.
PO—Big Valley, Alta.; SP—Same; RR—C. N. R.
PR—John Gillespie....Big Valley, Alta.
GM—John Gillespie, " "
TR—Wm. Gillespie, " "
PA—A. Albertson, " "
MS—A. Albertson, " "
EM—Nonna Fraco, " "
MM—F. Rattray, " "
S of H—1 Steam loco. and mules; track gauge 31 in.
S of M—1 Comp. air mach.
PP—Boiler, 50 H. P.
Output, 100 tons per day.

BLOCK COAL COLLIERIES.
Block Coal Collieries, Drift; Seam, 3½ to 4 ft. thick.
PO—Taber, Alta.; SP—Same; RR—C. P. R.
GM—J. Bilteryst.........Taber, Alta.
PA—J. Bilteryst, " "
MS—J. Biltersyt, " "
S of H—Rope and steam; track gauge 30 in.
S of M—Elec. cutting machine.
PP—2 Boilers, total 220 H. P., 1 gen. unit, 500 volts, D. C.

BRAS D'OR COAL COMPANY, LTD.
Colonial Mine; Slope; Collins Seam; 48 to 60 in. thick.
PO—Little Bras d'or, N. S.; SP—Same; RR—Canadian Government Railways.
PR—Hon. Nathaniel Curry, Transportation Bldg., Montreal, P. Q.
TR—Robert Blane,..North Sydney, N. S.
GM—George B. Burchell,
North Sydney, N. S.
MS—Samuel Gray
Little Bras d'or, N. S.
MM—James A. McDonald,
Little Bras d'or, N. S.
S of H—Horses.
PP—5 Return tubular boilers, total 500 H. P., 220 volts, A. C., 4 pumps. Purchase power.
EMP—80. Last fiscal year output 60,000 tons.
Note—Successors to Colonial Coal Co., Limited.

BRAZEAU COLLIERIES, LTD.
General Office, Toronto, Ont.
Nordegg Mine; Tunnel.
PO—Nordegg. Alta.; SP—Same; RR—Can. Nor., Brazeau Sub. Div.
PR—Sir William Mackenzie, Toronto, Can.
TR—R. P. Ormsby, "
VP—Martin Nordegg......Nordegg, Alta.

BRECKENRIDGE & LUND COAL CO., LTD.
PR—Harold Darling...Lundbreck, Alta.
VP—J. H. Wellington, " "
SECY—H. F. Breckenridge, " "
GM—H. C. Lancaster, " "

BRITISH COLUMBIA SKEENA COAL CO., LTD.
General Office, Hochelaga Bank Bldg., Quebec.
PR—James G. Scott............Quebec
TR—Alex Hardy, "
Developed eight tunnels on eight different seams, not yet producing coal.

CALGARY COLLIERIES, LTD.
General Office, Calgary, Alta.
Lessee—Wm. R. Walsh, Ardley, Alta.
Seam 6 ft. thick; 2 entries.
PO—Ardley, Alta; SP—Same; RR—Grand Trunk Pacific.
PR—Col. James A Walker, Calgary, Alta.
GM—Col. James A. Walker, " "
TR—F. E. Kenaston....Hopkins, Minn.

CAMBRIAN COLLIERIES, LTD.
Bell Mine; Shaft; Seam, 58 to 64 in. thick.
PO—Namao, Alta.; RR—E, D. & B. C., Bell Spur Br.
PR—D. M. Duggan......Namao, Alta.
TR—D. Jones, " "
GS—D. Jones, " "
EM—D. Jones, " "
S of M—Hand.
PP—1 Water tube boiler, 50 H. P., and 1 pump. Output, 100 tons per day.

CANADA WEST COAL CO., LTD., (THE)
Mine No. 1, Slope, Seam 45 to 56 in. thick.
PO—Taber, Alta.; SP—Same RR—Canadian Pacific, Crows Nest Pass Br.
PR—O. A. Robertson, San Francisco, Cal.
GM—J. R. Howard......Taber, Alta.
PA—J. R. Howard, " "
MS—Moses Johnson, " "
CE—E. S. F. Huntrods, " "
EM—E. S. F. Huntrods, " "
MM—A. J. Noble, " "
S of H—Mules and 4 Elec. locos; track gauge 36 in.
S of M—Hand and _ elec. and 24 comp air machines.
PP—6 Return tubular boilers, total 900 H. P., 3 gen. units, 2-250 D. C. and 2,400 A. C., 3 phases and 60 cycles, 2 comp., 2 pumps.
EMP—362. Last fiscal year output 125,000 tons.
Sales Agent, C. E. McQuaid, Regina, Sask.

CANADIAN PACIFIC RAILWAY (Dept. of Natural Resources.)
General office, Montreal, Que.
Galt Mines; Shafts; 48 to 60 in. thick.
PO—Lethbridge, Alta.; SP—Same; RR—C. P.
PR—Sir Thos. G. Shaughnessy,
Montreal, Que.
TR—H. E. Suckling, " "
GM—P. L. Naismith....Calgary, Alta.
GS—Lewis Stockett, " "
PA—J. T. H. Ferguson, " "
EM—B. L. Thorne, " "
MS—Robert Livingstone, Lethbridge, Alta.
MM—H. A. McMillan..Lethbridge, Alta.
S of H—8 comp. air locos., rope and horses. Track gauge 36 in.
S of M—Hand and comp. air mach.
PP—6 B. & W. water tube boilers, 10 return tubular boilers, total 2,500 H. P., 2 gen. units, 2,300 volts A. C., 2 phase, 60 cycles, 3 comp.
EMP—1000. Last fiscal year output 379,267 tons. Sales agent, B. T. Coon, Calgary, Alta.

CANADIAN COAL & COKE CO.
See North American Collieries, Ltd.

CANADIAN COLLIERIES (Dunsmuir) Ltd
General Office, Victoria, B. C.
PR—Sir Wm. Mackenzie, Toronto, Ont.
TR—A. J. Mitchell, " "
GS—J. R. Lockard..Cumberland, B. C.
PA—C. D. Hobbs.....Cumberland, B. C.
EE—Frank Sawford...Union Bay, B. C.
SCO—Island Supply Co. Buyer, W. E. Lawrence, Bevan, B. C.
Sales Agent, C. E. Thomas, Victoria, B.C.

Comox Mines, 2 Shafts and 2 Slopes; operate washery.
PO—Cumberland, B. C.; SP—Union Bay B. C.
MS—G. W. Clinton..Cumberland, B. C.
SM—W. E. Lawrence....Bevan, B. C.
S of H—Elec.
S of M—Hand and 3 Sullivan Elec Chain Mach.
PP—2 Gen. units 12,000 and 13,000 volts A. C. 3 phase, 25 cycles; Hydro Elec. plant.
EMP—1000. Coke ovens, 150 Bee Hive.

Wellington Mines; Slopes, operate washery
PO—Ladysmith, B. C.; SP—Same.
MS—J. H. Cunningham, Ladysmith, B. C.
S of H—3 Elec loco and mules
S of M—Hand.

CANMORE COAL CO.
Slope Mine.
PO—Canmore, Alta.; SP—Same; RR—C. P.
PR—James B. Neale....Minersville, Pa.
TR—S. B. Thorne, " "
MGR—Mont B. Morrow, Canmore, Alta.
PA—T. Lowdon, " "
MS—Wm. Musgrove, " "
EM—T. B. Williams, " "
MM—H. W. Evans, " "
EE—V. Pearson, " "
SCO—Rundle Mountain Trading Co.,
Canmore, Alta.
S of H—5 Comp. air loco.; track gauge 26 in.
S of M—Hand.
PP—5 Leonard & Son return tubular boilers, total 750 H. P., 3 gen. units A. C., 3 phase, 60 cycles, 2 compressors, 4 pumps.
EMP—290. Last fiscal year output 153,800 tons.

CAPE BRETON COAL, IRON & RAILWAY CO.
Broughton Mine, Slope, Broughton Seam 5 ft. 6 in. to 6 ft. 6 in. thick.
PO—Broughton, N. S.; SP—Homeville; RR—Sydney & Louisburgh
GM—D. J. Ferguson, Broughton, N. S.
Note—Operations suspended.

CAPITAL COAL CO.
Shaft Mine; Seam 144 to 168 in. thick.
PO—Cardiff, Alta.; SP—Same; RR—C. N. R.
PR—P. Gervais..........Cardiff, Alta.
TR—J. S. Ballantyne, " "
PA—P. J. Gorman, " "
CE—N. Fraser, " "
MM—E. Gervais, " "
S of H—Mules.
S of M—Hand.
PP—2 Water tube boilers, total 180 H. P., 2 pumps. Last fiscal year output, 90,500 tons.

CARDIFF COLLIERIES, LIMITED (THE)
General Office, Winnipeg, Man.
Slope Mine; seam 14 ft. thick.
PO—Cardiff, Alta.
PR—Lieut. Col. J. W. del O'Grady,
Winnipeg, Man.
VP—Andrew Kelly, " "
TR—J. C. Gage, " "
SECY—W. E. Brown, " "
GM—G. H. Eaton, ... Cardiff, Alta.
MS—F. B. Smith, " "

CHINOOK COAL CO., LTD.
General Office, Lethbridge, Alta.
Chinook Colliery Mine, Shaft. Lethbridge Seam, 4 ft. 2 in. to 5 ft. 6 in. thick.
PO—Commerce, Alta. SP—Kipp. RR—Canadian Pacific, Crow's Nest Branch.
PR—Wm. A. Wood, .. Hamilton, Ont.
GM—J. C. Reid, .. Lethbridge, Alta.
PA—H. W. Crawford, " "
MS—A. H. Reid, Commerce, "
EM—H. R. Brown, " "
MM—A. Higgins.......Commerce, Alta.
S of H—Rope and mules. Track gauge 3 ft. 6 in.
S of M—21 Comp. Air Machines.
PP—5 Return tubular boilers, total 750 H.P., 1 Gen. Unit, 2,300 volts A.C., 3 phases, 60 cycles, 2 Compressors, 1 pump.
EMP—290. Last fiscal year output 135,000 tons. Sales agent, J. P. Smyth, Lethridge, Alta.

CLOVER BAR COAL CO., LTD.
General Office, Edmonton, Alta.
Shaft Mine. Lignite Seam 7 ft. thick.
PO—Edmonton, Alta; RR—Grand. Trunk Pacific.
PR—H. E. Rogers,.. Edmonton, Alta.
VP—J. J. Milledge, " "
SECY—J. F. Hunter, " "
TR—H. H. Robertson, " "
GM—J. F. Hunter, Clover Bar, Alta.
MS—David Jones, " " "

COALBECK COAL & CLAY PRODUCTS CO.
Coalbeck Collieries & No. 1 Entry Mines, Slope and Drift, Pempina or Big Seam 5 to 8 ft. thick.
PO—Coalbeck, Castor. SP—Castor. CTY—Alberta. RR—C. P., Lacomb Branch.
PR—Carl Stettler, ... Castor, Alta.
GM—Otto Von Hough, " "
CE—T. B. Stephens, Calgary, "
MM—Albert Hallseth, Castor, "
MS—Otto VonHough, ... Castor, Alta.
S of H—Mules. Track gauge 32 in.
S of M—Hand.
PP—3 pumps, gasoline engine.
EMP—17 to 41. Last fiscal year output 12,000 tons. Sales agent, H. S. Northwood, Castor, Alta.

COLONIAL COAL CO., LTD.
See Bras d'or Coal Company, Ltd.

COLUMBIAN COAL & COKE CO., Ltd.
General Office, 614 Grain Exchange Bldg., Winnipeg, Man.
Coalmont Collieries; Drift; Seam 30 to 48 in. thick.
PO—Coalmont, B. C.; SP—Same; RR—C. P. R. & Great Northern.
PR—W. L. Parrish,
Grain Ex. Bldg, Winnipeg, Man.
TR—J. T. Haig, " " "
S of H—Mules.
S of M—Hand (Comp. air later).
PP—Air comp.
EMP—20. Last fiscal year output, 6,000 tons.

CONN, WILLIAM.
Plume Creek Mine, Drift, Lignite Seam, 12 ft. thick.
PO—Wolchester, Alta.
MS—Taras Manchenko, Wolchester, Alta
S of H—Mules. Track gauge 2 ft.
S of M—Hand.
EMP—4. Last fiscal year output 200 tons.

CORBIN COAL & COKE CO.
General Office, Spokane, Wash.
Nos. 3 and 4 Mines, Stripping and drift. Seam 40 to 260 ft. thick.
PO—Corbin, B. C. SP—Same, via McGillivray. RR—Eastern B. C. Ry.
PR—D. C. Corbin, .. Spokane, Wash.
GM—R. S. Ord.........Spokane, Wash.
TR—A. M. Allen, " "
PA—Charles Graham, .. Corbin, B.C.
MS—Charles Graham, " "
FM—W. B. Hetherington..Corbin, B. C.
SCO—Flathead Trading Co. Buyer, E. J. Roberts, Jr., Corbin, B.C.
S of H—1 Comp. air loco. and horses. Track gauge 24 and 36 in.
S of M—Hand.
PP—5 Return tubular boilers, total 500 H.P. 1 gen. unit, 2,300 volts A. C., 3 phase, 60 cycles; 1 compressor.

EMP—120. Last fiscal year output 64,750 tons.

CROW'S NEST PASS COAL CO. LTD.
General Office, Fernie, B. C.
Coal Creek, Michel and Carbonado Mines, Drift.
PO—Coal Creek, Michel and Carbonado B. C. SP—Fernie, Michel, Morrissey, Jct. Swinton, B. C.; RR—C. P. & G. N.
PR—Elias Rogers, ... Toronto, Ont.
VP—E. C. Whitney, .. Ottawa, "
GM—W. R. Wilson, ... Fernie, B.C.
PA—R. M. Young, " "
MS—B. Canfield.....Coal Creek, B. C. Thos. Russell, Michel, B. C.
S of H—Comp. air.
S of M—Hand and machine.
EMP—2,000. Coke ovens, 1,180 Bee Hive type. Last fiscal year output 888,858 tons. Gen'l Sales Agt., John Rogers, Fernie, B. C.

CUMBERLAND RY. & COAL CO.
Absorbed by the Dominion Coal Co.

DAVENPORT COAL COMPANY, LTD.
General Office, Spokane, Wash., U.S.A.
PO—Burmis, Alta. SP—Same. RR—Canadian Pacific. Crow's Nest Pass Branch.
VP—W. Clayton Miller..Spokane, Wash.
SECY—C. Hussey, " "
PP—2 boilers, total 160 H.P. D.C. Generator, operating fan, tipple, etc. Tipple equipped with Rotary dump and Marcus Screen and conveyor 60 ft. in length, handling 120 tons of coal per hour.

DAVIS COAL CO.
See Davis & Green Coal Co.

DAVIS & GREEN COAL CO.
Alfrida Mine, Drift, "Lignite" Seam, 3½ to 4 ft. 10 in. thick.
PO—Halkirk, Alta. SP—Same. RR—C. P. R., Lacombe Branch.
S of H—Hand. Track gauge 23 in.
S of M—Hand.
EMP—4. Last fiscal year output 594 tons.

DAWSON COAL CO (THE) LTD.
PR—Richard Secord...Edmonton, Alta.
VP—John Henderson, " "
TR—C. A. Hyndman, " "
GM—Charles A. Hyndman, " "
MS—L. Parker, " "
CE—Norman Fraser, " "
Tipple capable of handling 500 tons per day.

DIAMOND VALE COLLIERIES, LTD.
General Office, Vancouver, B.C.
Diamond Vale Mine, Seam 5 ft. thick.
PO—Merritt, B. C. SP—Same. RR—C. P. and Kettle Valley.
PR—T. J. Smith, ...Vancouver, B.C.
GM—T. J. Smith, " "
TR—J. A. MacInnes, " "
S of H—Steam. Track gauge 30 in.
S of M—Hand.
PP—Babcock & Wilcox boiler, total 300 H.P. Commenced development only Not started mining.

THE DOBELL COAL CO., OF TOFIELD, LTD.
General Office, 138 St. Peter St., Quebec.
Stripping, Edmonton Formation Seam, 7 to 11 ft. thick.
PO—Tofield, Alta. SP—Same. RR—Grand Trunk Pacific, Calgary-Tofield Branch.
PR—W. M. Dobell, ... Quebec, Can.
TR—F. O. Judge, " "
GM—T. R. Henderson, Tofield, Alta Can.
S of H—Horses. Track gauge 2 ft. and 56½ in.
S of M—Hand.
PP—3 Water tube boilers, each 60 H P.
EMP—30. Last fiscal year output 21,370 tons.

DODDS, CURRIE & HODING.
Stopp Mine, Slope; "Lignite" Seam, 3 ft. 6 in. to 4 ft. 2 in. thick.
PO—Carbon, Alta.
GM—Fred Bessant.
S of H—Horses. Track gauge 26 in.
S of M—Hand.
PP—1 pump.
EMP—6. Last fiscal year output 2,766 tons.

DOMINION COAL CO.
General Office, Glace Bay, N.S.
PR—Mark Workman.....Montreal, P. Q.
TR—C. S. Cameron.... Sydney, N.S.
GM—D. H. McDougall....Sydney, N. S.
PA—J. W. Revere, .. Glace Bay, N.S.
GS of Mines—A. J. Tonge, " " "
EM—A. J. Tonge, " " "
MM—J. S. Whyte, " " "
EE—V. McFadden, " " "
SM—F. H. Stephenson,
Sales agent, Alex Dick, Montreal, Que.

Nos. 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 15, 16, 17, 21 and 22 Mines, 6 Shafts and 12 Slopes; Phalen, Hub, Harbor, Emery, Victoria, Lingon, Birch Grove and Springhill Seams, 54 to 90 in. thick. Operate Washery.
PO—Glace Bay, N.S. and Springhill, N.S. SP—Same. CTY—Cape Breton and Cumberland. RR—Cumberland Ry., Sidney & Louisburg Ry.
S of H—Comp. air loco. steam and elec. engines, endless rope and horses.
S of M—Comp. air mach. and hand.
PP—2 central power station.
EMP—12,000. Last fiscal year output 4,898,421 tons.

DRUMHELLER COAL & COKE CO. LTD.
Drumheller Mine; Slope; Seam 42 to 114 in. thick.
PO—Drumheller, Alta. SP—Same RR—Canadian Northern, Calgary-Saskatoon Br.
PR—Samuel Drumheller, Drumheller, Alta.
GS—Samuel Drumheller, Drumheller, Alta
PA—Samuel Drumheller, Drumheller, Alta
TR—J. L. Drumheller, Spokane, Wash.
MS—Jas. Crowder.....Drumheller, Alta
EM—A. S. Gray, " "
MM—Adam Gray.
S of H—Mules and rope. Track gauge 3 ft.
S of M—Hand.
PP—1 Water tube, 1 Jenckes return tubular boiler, total 175 H. P., 4 generating units, 3 pumps. Sales agent, Ralph R. Maxson, Drumheller, Alta.

ELLIS COAL COMPANY, LTD.
Shaft Mine; Lignite Seam; 60 in. thick.
PO—Three Hills, Alta; SP—Same; RR—Grand Trunk Pacific.
PR—W. Ellis, Three Hills, Alta. Canada.
TR—W. Ellis, " " "
GM—W. Ellis, " " "
GS—W. Ellis, " " "
PA—W. Ellis, " " "
MS—W. Ellis, " " "
CE—Norman Fraser, Three Hills, Alta., Canada.
EM—Norman Fraser, Three Hills, Alta., Canada.
EE—James Duffie, Three Hills, Alta., Canada.
MM—James Duffie, Three Hills, Alta., Canada.
SM—W. Ellis, " " "
S of H—Mules. Track gauge 36 in.
S of M—1 comp. air mach.
PP—2 return tubular boilers, total 125 H. P., 3 gen. units, 10 to 20 volts D. C., 1 air compressor.
EMP—10.
Note—Successors to Knee Valley Coal Co.

ELLIS MINES.
Ellis Mines, Slope, Lignite Seam 42 to 48 in. thick.
PO—Champion, Alta. SP—Same. RR—C.P.R.
PR—Wm. Ellis, ... Champion, Alta.
MS—Wm. Ellis, " "
S of H—Mules. Track gauge 25 in.
S of M—Hand.
EMP—8 to 12. Last fiscal year output 4,500 tons.

FRANCO CANADIAN COLLIERIES, Ltd.
Shaft and Old Mines.
PO—Frank, Alta.; SP—Same; RR—Can. Pac.
PR—Viscount Pierre de Chezelles, Boulleaume, Lierville (Oise), France.
GM—C. J. Tompkins......Frank, Alta.
GS—J. R. McDonald, " "
S of H—Gasoline loco., rope and mules.
S of M—Hand.
PP—4 Boilers, total 1,000 H. P., gen. units, 2,300 volts A. C.
Successors to the Canadian Coal Con. Ltd.

GAINFORD COLLIERIES, Ltd.
Out of business.

GEORGETOWN COLLIERIES, LTD.
General Office, 28-30 Line Street, London, England.
No. 3 Mine; Slope; Anthracite Seam, 57 to 66 in. thick.
PO—Canmore, Alta.; SP—Same; RR—C. P.
Chairman, S. K. George, The Brackeds, Ascot, England; Sec'y, W. E. Y. Hale, Yateacke Creane Road, Sutton Survay, England.
GM—W. H. Wain......Canmore, Alta
PA—T. P. Smith, " "
MS—J. L. Parker, " "
EM—J. L. Parker, " "
CE—W. H. Wain, " "
MM—H. Alexander, " "
EE—W. Alexander, " "
S of H—Steam hoist and rope; track gauge 26 in.
S of M—Hand.
PP—3 Return tubular boilers, total 300 H. P., gen. unit, 50 K. W., 220 volts, D. C., 1 pump.
EMP—119.

GREAT WEST COAL COMPANY, LTD.
General Office, Edmonton, Alta.
Black Diamond Mine; Drift; 66 to 96 in. thick.
PO—Clover Bar, Alta.; SP—Same; RR—G. T. P.
PR—James C. Dunn....Edmonton, Alta
SEC—William S. Cupples, " "
GS—Alex. C. Dunn, ...Clover Bar, Alta.
MS—John Russell, " "
MM—Antonia Beaumonte, " "
S of H—Rope and mules. Track gauge 21 in.
PP—2 Waltrous Eng. Co. return tubular boilers, total 220 H. P., 2 gen. units, 220 volts D. C., 2 pumps.
Last fiscal year output 60,000 tons.

GREENAWAY COMPANY.
Greenaway Mine, Slope, Seam 4 to 5 ft. thick.
PO—Reidhill, Alberta. SP—Champion. RR—C.P.R.
PR—W. J. Greenaway, Reidhill, Alta.
S of H—Mules. Track gauge 3 ft.
S of M—Hand.
EMP—4. Last fiscal year output 2,000 tons.

HAECKL, J. A.
Grey Eagle Mine, Drift, 4¾ to 5¼ ft. thick.
PO—Fraserton, Alta.; SP—Hanna, Alta.; RR—C. N. R.
PR—J. A. Haeckl......Claremore, Okla.
GM—Chas. Laarz......Fraserton, Alta.
S of H—Gravity. Track gauge 2 ft.
S of M—Hand. Last fiscal year output 1,200 tons.

HALBERT BROS.
Slope Mine, Lignite, 72 in. thick.
PO—Trochu, Alta. SP—Same. RR—Grand Trunk.
GM—David Halbert, .. Trochu, Alta.
PA—Robert Halbert, " "
MS—O. Halbert ....Trochu, Alta.
S of H—Horses. Track gauge 24 in.
S of M—Hand.
EMP—5. Last fiscal year output 1,505 tons.

HILLCREST COLLIERIES, LTD.
General Office, Montreal, Que.
Hillcrest Mine; Slope; 168 ins. thick.
PO—Hillcrest, Alta.; SP—Same; RR—Can. Pac.; Crow's Nest Pass Div.
PR—C. B. Gordon......Montreal, Que.
MGR-DIR—J. M. Mackie, " "
TR—Frank J. Smith....Hillcrest, Alta.
PA—Frank J. Smith, " "
GM—Robert G. Drinnan, " "
EM—David S. Hutchinson, " "
MM—Thomas Hargreaves, " "
GS—Robert T. Stewart, " "
MS—Robert T. Stewart, " "
S of H 2 Steam loco.; track gauge, 36 in.
S of M—Hand.
PP—6 Goldie, McCullough water tube boilers, 750 h. P., gen. unit, 2,300 volts A. C., 3 phase, 60 cycles; 1 compressor,, 1 pump.
EMP—390. Last fiscal year output 224,750 tons.

HUMBERSTONE COAL CO.
General Office, 9981 Jasper Ave., Edmonton, Alberta.
Humberstone Mine; Shaft and Drift; Lignite Seam; 60 to 96 in. thick.
PO—Beverly, Alta.; SP—Edmonton; CTY—Alberta; RR—Grand Trunk Pac.
Owner—B. J. R. Humberstone, Edmonton, Alta.
GM—B. J. R. Humberstone, " "
MGR—C. G. Sheldon, " "
PA—C. G. Sheldon, " "
MS—William Duggan.....Beverly, Alta.
EM—William Duggan, " "
MM—H. R. Johnston, " "
EE—H. Sadler, " "
SCO—Humberstone Store. Buyer, H. G. Baker, Beverly, Alta.
S of H—Rope and horses. Track gauge 22 in.
S of M—4 comp. air mach.
PP—3 Leonard, Watrous and Robb return tubular boilers, total 250 H. P., 3 pumps.
EMP—50 to 150. Last fiscal year output 44,753 tons.

INLAND COAL & COKE CO.
General Office, Merritt, B.C.
Inland Mine, Slope and Shaft, Seam 10 ft. thick.
PR—Geo. I. Wilson, Vancouver, B.C.
VP—W. L. Nichol, " "
SECY—K. C. Smith, " "
TR—K. C. Smith, " "
GM—Joseph Graham, ..Merritt B.C.
MS—Andrew Bryden, " "
S of H—Rope and mules.
S of M—Hand.
PP—2 Leonard boilers, total 100 H P. 1 pump.
EMP—46. Last fiscal year output 51,300 tons.

INTERCOLONIAL COAL MINING CO., Ltd.
Drummond Mine; Slopes; Main or Second Seam, 84 to 204 in. thick. Operate Washery.
PO—Westville, N. S.; SP—Same; RR—I. C.
PR—Charles Fergie, ME. Dominion Express Bldg., Montreal, Que.
EM—Charles Fergie, ME. Dominion Express Bldg., Montreal, Que.
MGR Dir.—Charles Fergie, ME. Dominion Express Bldg., Montreal, Que.
TR—George E. Damant, Montreal, Que.
GM—William Maxwell Westville, N. S.
Res. Agt—R. MacDougald, " "
Comptroller—G. P. Gordon, " "
MS—Matthew C. Richardson, Westville, N.S.
S of H—2 Steam loco., horses and gravity; track gauge 32½ in.
S of M—Hand.
PP—8 Water tube, 3 shell and 4 return tubular boilers, total 1,800 H.P., 1 gen. unit 2,300 volts A.C., 3 phase, 60 cycles, 1 compressor, 1 pump.
EMP—650. Coke ovens, 20 Bee Hive. Last fiscal year output 200,079 tons.

INTERNATIONAL COAL & COKE CO. LTD. (THE)
Denison Colliery, Drift, No. 2 and 4 Seams, 6 to 15 ft. thick.
PO—Coleman, Alta. SP—Same. RR Canadian Pacific, Crow's Nest Branch.
PR—A. C. Flumerfelt....Victoria, B. C.
TR—John McKeagan, . Coleman, Alta.
GM—O. E. S. Whiteside, " "
PA—W. S. Bosworth, " "
MS—W. A. Davidson, " "
EM—W. A. Davidson....Coleman, Alta.
MM—James Scott, " "
EE—Thomas Waklem, " "
S of H—10 Compressed Air loco. Track gauge 3 ft.
S of M—Hand and comp. air machines.
PP—10 return tubular boilers, total 1,500 H.P., 2 gen. units, 220 volts D. C., 2 H. S., and 1 L. S. air compressors, 1 pump.
EMP—181. Coke ovens, 216 Bee Hive. Last fiscal year output, 106.962 tons.

INVERNESS RY. & COAL CO.
J. McGillivray, Receiver & Mgr.
Inverness Mine, Slope.
PO—Inverness, N.S. SP—Same. RR—Inverness.
PA—J. McGillivray....Inverness, N. S.
EM—A. H. Arens, .. Inverness, N.S.
MS—Joseph Johnston, " "
Mine MGR—Simon Doucet, " "
MM—A. Ross, " "
EE—Vance McLeod, " "
S of H—Rope and steam loco
S of M—Hand.
PP—8 boilers, 2000 H. P.
EMP—800.

JASPER PARK COLLIERIES, LTD.
General Office, Edmonton, Alta.
Jasper & Mieke Mines; Drift; Kootenai Seam, 96 to 144 in. thick.
PO—Pocahontas, Alta.; SP—Same; RR—Can. Nor., Grand Trunk Pac.
PR—J. L. Washburn......Duluth, Minn.
TR—R. J. Maxwell....Pocahontas, Alta.
GM—R. H. Morris, " "
PA—R. F. Overly, " "
EM—J. C. Callander, " "
MM—T. D. Stockdale, " "
EE—T. D. Stockdale, " "
MS—A. N. Scott, " "
SCO—Address the company. Buyer, A. Matheson, Pocahontas, Alta.
S of H—3 Comp. air loco.; track gauge, 42 in.
S of M—Hand and comp. air machines.
PP—4 Return tubular boilers, total 600 H. P., 2 gen. units, 480 volts A. C., 3 phase, 60 cycles, 1 compressor.
EMP 150. Last fiscal year output 71,770 tons.

KEITH & FULTON COAL CO.
Keith & Fulton Mine, Drift, Lignite Seam, 6 ft to 6 ft. 9 in. thick.
PO—Box 623, Edmonton, Alta.; RR—G. T. P.
MS—S. Finley,.......Clover Bar, Alta
S of H—Mules. Track gauge 21 in.
S of M—Hand.
EMP—8. Last fiscal year output 5,000 tons.

KING, G. H.
G. H. King Mine; Shaft; Seam 22 to 30 in. thick.
PO—Minto, N. B.; SP—Same; CTY—Sunbury; RR—Fredericton & Grand Lake.
PR—G. H. King........Minto, N. B.
TR—G. H. King, " "
GM—G. H.. King, " "
MS—Henry Bauer, ... Minto, N.B.
MM—Thos. Swift, " "
SCO—King Lumber Co., Ltd. Buyer, E. D. King, Minto, N. B.
S of H—Steam hoists. Track gauge 30 in.
S of M—Hand.
PP—1 water tube boiler, 1 gen. unit.
EMP—35. Last fiscal year output 13,117. tons.

KNEE VALLEY COAL CO.
See Ellis Coal Co.

LEITCH COLLIERIES, LTD.
Drift Mine.
PO—Passburg, Alberta. SP—Hillcrist, Alta. RR—C.P.

(Continued on Next Page.)

Leitch Collieries, Ltd.—Cont.
GM—W. L. Hamilton,.. Passburg, Alta.
PA—Jas. Dougall, " "
EM—A. W. Barnes, " "
MS—W. G. Pearson, " "
SM—Jas. Dougall, " "
S of H—Elec. Loco.
S of M—Hand and comp. air.
PP—1 gen. unit 250 volts, D.C., 8 boilers, total 500 H.P.
EMP—350. Coke ovens, 101.

McGILLIVRAY CREEK COAL & COKE CO.
Carbondale Mine; Slope, Seam, 108 to 168 in. thick.
PO—Coleman, Alta.; SP—Same; RR—Can. Pac.; Crow's Nest Br.
PR—Lorne A. Campbell..Rossland, B. C.
TR—W. E. Cullen, Jr.....Spokane, Wash.
ASST to PR—R. S. McKibbin, Coleman, Alta.
GS—George Kellock, " "
MGR—George Kellock, " "
EM—G. W. B. Daniell, " "
MM—H. McLeod, " "
EE—W. R. Godfrey, " "
S of H—3 Elec. and 2 storage battery, loco's; track gauge, 42 in.
S of M—Hand.
PP—Boilers, total 735 H. P., 3 gen. units, 250 volts D. C., 1 compressor, 3 pumps and 2200 volts A. C., 3 phase, 60 cycles.
EMP—250. Last fiscal year output 160,000 tons.

MAPLE LEAF COAL CO.
General Office, Spokane, Wash., U.S.A.
PO—Bellevue, Alta.
PR—D. M. Drumheller, Spokane, Wash.
VP—A. Coolidge " "
TR—C. P. Lund, " "
GM—James Finlay, ...Bellevue, Alta.
MS—J. McCullock, " "

MARITIME COAL RY. & POWER CO, LTD.
Joggins Mines; Slope, Joggins Seam, 39 to 42 in. thick.
PO—Joggins Mines, N. S.; SP—Same; RR—Maritime Ry. (Owned by the Company).
PR—Wm. Hanson, St. James St., Montreal, Que.
GM—Robert J. Bell..Joggins Mines, N. S.
PA—Robert J. Bell, " "
MS—C. J. Kent, " " "
S of H—9 Elec., 3 comp hoisting engines and rope.
S of M—4 Elec. mach.
PP—10 Return tubular boilers, total 1,6 0 H. P., 3 gen. units, A. C., 3 phase, 60 cycles. Power purchased.
EMP—400. Last fiscal year's output, 100,000 tons.

MIDDLESBORO COLLIERIES, LIMITED
Nos. 1, 2, 3, 4, 5, 6, 7 and 8 Mines; Slopes; Seam 72 to 216 in. thick.
PO—Middlesboro, B. C.; SP—Merritt, B. C.; RR—Can. Pac., Nicola Branch.
TR—H. R. Plommer, Middlesboro, B.C.
PA—H. R. Plommer, Middlesboro, B. C.
MS—Robert Fairfoull, " "
CE—Robert Fairfoull, " "
MM—J. A. Crawford, " "
S of H—1 Steam loco, comp. air hoists, mules and rope; track gauge 36 in.
S of M—6 Comp. air mach and hand.
PP—5 Goldie & McCullough return tubular boilers, 1 loco. boiler, total 1,400 H.P., 2 compressors, 4 pumps.
EMP—130. Last fiscal year output 50,000 tons.
Sales Mgr., H. R. Piommer, Middlesboro, B. C.
Successors to the Nicola Valley Coal & Coke Co., Ltd.

MIDLAND COLLIERIES COMPANY, LTD.
Midland Mine, Slope; Edmonton Seam, 5 to 7 ft. thick.
PO—Drumheller, Alta.; SP—Same; RR—C. N. R., Goose Lake to Calgary.
PR—T. G. McMullen......Truro, N. S.
TR—Jas. McMurray....St. John N. B.
GM—S. Lent McMullen, Drumheller, Alta.
MS—John Robertson, " "
EM—John Robertson, " "
CE—W. F. Jennison.......Truro, N. S.
MM—Edw. Ward......Drumheller, Alta.
S of H—Mules; track gauge 26 in.
S of M—Hand.
PP—2 boilers, total 105 H. P., 3 pumps.
EMP—90. New Mine first year's operating Last fiscal year output 14,000 tons.
Sales Agent, C. A. Brodigan, 406 McClean Bldg., Calgary, Alta.

MINTO COAL COMPANY, LTD., THE
Mines Nos. 1, 2, 3, 4, 5, 6 and 7, Shafts, Seam 30 in. thick.
PO—Minto, N. B.; CTY—Queens; RR—Canadian Pacific Ry.
PR—Sir Thomas Lait, Montreal Que.
TR—R. B. Hanson, Fredericton, N. B.
GM—John Henderson .... Minto, N.B.
EM—John Henderson, " "
MS—John Henderson......Minto, N. B.
S of H—Steam hoists; track gauge 30 in.
S of M—Hand.
PP—8 fire tube boilers; 8 pumps.
EMP—230. Last fiscal year output 100,000 tons.

MINUDIE COAL CO., Ltd.
General Office, Transportation Bldg., Montreal, Que.
Minudie and Victoria Mines; Slope; Seam, 24 to 34 in. thick.
PO—River Herbert, N. S. SP—Same; RR—Joggins.
PR—Jas. Robinson, ...Montreal, Que.
TR—George H. Bisset, " "
GM—John S. Barton, River Herbert N.S.
MM—F. Carmichael, " "
S of H—1 Steam loco.
S of M—Hand.
PP—6 Robb. Matherson, return tubular boilers, total 600 H.P., 2 pumps.
EMP—300. Last fiscal year output 72,000 tons.
Sales Agency, R. S. Hibbard, River Herbert, N.S.

MORNING STAR COAL CO.
Slope Mine, "Alberta Lignite" Seam, 4½ ft. thick.
PO—Grassy Lake, Alta.; SP—Same; RR—C. P. R.
PR—Geo. Gibson, Sr., Grassy Lake, Alta.
TR—Geo. Gibson, Jr...Grassy Lake, Alta.
TR—Geo. Gibson, Sr., " "
GM—Mark Hancock " "
MS—Mark Hancock....Grassy Lake, Alta.
EM—Norman Fraser....Edmonton, Alta.
S of H—Horses; track gauge 30 in.
S of M—Hand.
EMP—5. Output for 4½ mo., 1,200 tons.

MOUNTAIN PARK COAL CO., LTD.
General Office, 301 Tegler Bldg., Edmonton, Alta.
Mountain Park Mine.
PO—Mountain Park, Alta; SP—Same; RR—Grand Trunk Pac. Ry.
PR—C. J. Leyland....Beals, England
SECY—E. M. Anderson, Edmonton, Alta.
GM—N. M. Thornton, " "
PA—L. E. Drummond, " "
MS—Jas. Darbyshire, Mountain Park, Alta
MM—W. F. Henry, " "
SCO—McNaughton-Powell Co. " "
Sales Agent, L. E. Drummond, Edmonton, Alta

NEW BARNES COAL MINE CO.
New Barnes Mine, Drift, Belly River and Galt Seams, 44 to 54 in. thick.
PO—Royal View, Lethbridge Alta.; SP—Lethridge, Alta.; RR—Canadian Pacific.
CM—A. E. Dupew, Royal View, Lethbridge, Alta.
MS—Jas. Hunter......Royal View, Alta.
MS—Jas. A. Richards, South Lethbridge, Alta.
SCO—Royal City Mercantile Co., Royal View, Alta.
S of H—Gravity; track gauge 26½ in.
S of M—Hand.
EMP—25. Last ficsal year output 3,254 tons.

NEW CASTLE COAL CO.
New Castle Mine; Shaft and Slope; Seam 54 to 64 in. thick.
PO—Drumheller, Alta.; SP—Same; RR—C. M. R.
PR—Jesse Gouge, ...Drumheller, Alta.
TR—G. M. Coyle, " "
GM—James Holden, " "
MS—James Holden, " "
S of H—Mules.
S of M—Hand.
PP—3 Water tube boilers, total 150 H.P., 2 gen. units 110 volts D.C.
EMP—200. Last fiscal year output 100,000 tons.

NORTH AMERICAN COLLIERIES, LTD.
General Offices, Montreal, Que.
PR—H. A. Lovett......Montreal, Que.
GM—H. A. Lovett, " "
TR—S. T. Mains......Edmonton, Alta.
PA—J. G. Cockrane, " "
GS—N. C. Pitcher, " "
CE—N. C. Pitcher, " "
EM—W. D. Strand..Beaver Mines, Alta.
MM—Robert Brown " "
EE—Robert Brown—, " "
Sales Agent, J. O. Hannah.

Lethbridge Colliery; Shaft; Seam, 4½ ft. to 5½ ft. thick.
PO—Coalhurst, Alta; SP—Kipp, Alta; RR—C.P.
MS—Wm. Maxwell....Coalhurst, Alta.
MM—R. Brown........Coalhurst, Alta.
S of H—Horses and endless rope. Track gauge 36 in.
S of M—55 comp. air mach.
PP—6 B. & W. water tube boilers, total 1500 H. P., 2 gen. units 2200 volts A. C., 3 phase and 60 cycles; 1 comp., 2 pumps.
EMP—450. Last fiscal year output 200,000 tons.

Pacific Pass Mines; Slope; 16 and 18 ft. thick.
PO—Lovett, Alta.; SP—Same; RR—Grand Trunk Pacific.
MS—A. A. Miller........Lovett, Alta.
MM—J. Burchell......Lovehville, Alta.
S of H—Horses and tail rope; track gauge 36 in.
S of M—2 Comp. air mach. and hand.
PP—4 B. & W. water tube boilers, total 1000 H. P., 2 gen. units 2200 volts A. C., 3 phases and 60 cycles; 2 pumps.
Note—Just developing.

St. Albert Mines; Shaft.
PO—St. Albert, Alta.; RR—Canadian Nor.
GM—T. O'Donnell....St. Albert, Alta.
MS—C. McGillvary, " "
NOTE—Developing, June 15th.

Beaver Colliery Mine; Drift and Slope; No. 2 Seam, 88 in. thick.
PO—Beaver Mines, Alta.; SP—Pincher Station, Alta.; RR C. P.
MS—Samuel McVicar, Beaver Mines, Alta.
S of H—Rope and mules.
S of M—Hand.
PP—4 Return tubular boilers, total 600 H. P., gen. units, 2,300 A. C., 3 phase 60 cycles.
EMP—78. Last fiscal year output, 27,826 tons.

NORTHFIELD COAL CO., LTD.
Sunbury Mine; Shaft; Grand Lake Coal Area; 28 to 32 in. thick.
PO—Minto, N. B.; SP—Same; CTY—Sunbury; RR—N. B. C. & R., and Sunbury; RR—N. B. C. & R.
PR—Hon. James Barnes, Buctouche, N.B.
GM—Hon. James Barnes, " "
TR—J. M. Kennedy......Minto, N. B.
PA—J. M. Kennedy....Minto, N. B.
SM—J. M. Kennedy, " "
MS—William Gould......Minto, N. B.
S of H—1 comp. air loco. Track gauge 30 in.
S of M—Hand.
PP—1 boiler, 25 H. P., 1 gen. unit 1 pump and 1 air comp.
EMP—15 to 20. Last fiscal year output 6,000 tons.

NOVA SCOTIA STEEL & COAL CO., Ltd.
General Office, New Glasgow, N. S.
PR—Col. Thomas Cantley, New Glasgow, N. S.
GM—Col. Thomas Cantley, New Glasgow, N. S
SECY—Archibald McColl, " "
PA—W. G. Stanfield, " "
GS—Thos. J. Brown, Sydney Mines, N.S.
MS—John Johnston, " "
EM—R. E. Chambers, " "
MM—W. H. Graham, " "
EE—W. H. Pickles, " "
SCO—Address the Company. Buyer, J. W. Ratchford, Sydney Mines, N.S.

Sales Agent, W. Lithgow, New Glasgow, N. S.

Princess No. 1 Mine; Shaft; Old Sydney Seam, 6 ft. thick; operate washery.
PO—Sydney Mines N. S.; SP—Same; RR—Intercolonial.
MS—P. Christinson, Sydney Mines, N.S.
S of H—Endless rope; track gauge 30 in.
S of M—10 Comp. air mach.
PP—8 Babcock & Wilcox water tube boilers, total 2400 H. P., 2 comp. 1 pump.
EMP—600. Coke Ovens, 30 Banner type. Last fiscal year output 156,185 tons.

Florence No. 3 Mine; Slope; Old Sydney Seam, 6 ft. thick.
PO—Florence, N. S.; SP—Same RR—Intercolonial.
MS—Angus Ferguson, Florence, N. S.
S of H—Endless rope; track gauge 30 in.
S of M—50 Comp. air mach.
PP—6 Stirling water tube boilers, total 1500 H. P., 2 comp., 1 pump.
EMP—500. Last fiscal year output 180,350 tons.

Scotia No. 4 Mine; Old Sydney Seam, 6 ft. thick.
PO—Little Bras d' Or, N. S.; SP—Same; RR—Intercolonial.
MS—D. G. McDonald, Sydney Mines, N.S.
S of H—Rope; track gauge 30 in.
S of M—30 Elec. mach.
PP—Gen. unit 250 volts D. C., 3 phase, 60 cycle power from Blast Furnace Plant.
EMP—400. Last fiscal year output 127,602 tons.

Queen No. 5 Mine; Shaft; Old Sydney Seam, 6 ft. thick.
PO—Sydney Mines N. S.; SP—Same; RR—Intercolonial.
MS—Robert Robertson, Sidney Mines. N.S.
S of H—Endless rope; track gauge 30 lb.
S of M—Hand.
PP—3 Return tubular boilers, total 300 H. P.
EMP—300. Coke ovens, 90 Bernard type. Last fiscal year output 120,000 tons.

Inbillee No. 6 Mine; Shaft; Greener Seam, 5 ft. thick.
PO—Sydney Mines N. S.; SP—Same; RR—Intercolonial.
MS—Robert Robertson, Sidney Mines. N.S.
S of H—Elec. loco. and endless rope; track gauge 30 in.
S of M—5 Elec. mach.
PP—Power from Central Plant at Blast Furnaces.
EMP—100. Last fiscal year output 57,785 tons.

Jubilee Mine; Shaft; "Indian" Seam; 72 in. thick.
PO—Sydney Mines, N. S.; SP—Same; RR—Intercolonial.
MS—Wm. Tobin, Sydney Mines, N. S.
S of H—Elec. locos.
PP—Central plant at Blast Furnace.
Note—New mine.

PACIFIC COAST COAL MINES, Ltd.
General Office, Victoria, B. C.
PR—James Carruthers,...Montreal, Que.
GM—John H. Tonkin....Victoria, B. C.
TR—Talbot Schmuck.....Victoria, B. C.
PA—Talbot Schmuck....Victoria, B. C.
MM—J. C. McGregor, S. Wellington, B. C.
EM—Edw. Wright, So. Wellington, B. C.
South Wellington Nos. 1, 2, 3 and 4 Mines; Slope and Shaft; Douglas Seam, 4 to 30 ft. thick; operate washery.
PO—South Wellington, B. C.; SP—68 Mile Post, B. C.; RR—E. & N.
GS—Robt. Bonar..S. Wellington, B. C.
S of H—3 steam locos. and rope; track gauge 36 in.
S of M—1 Comp. air mach.
PP—8 Return tubular boilers total 1200 H. P., 3 gen. units 440 A. C., 3 phase, 60 cycles.
EMP—600.

Suquash Nos. 1 and 2 Mines; Seam 3½ ft. to 4 ft. 3 in. thick.
PO—South Wellington, B.C. SP—Suquash, B. C.
At present in state of development.

PACIFIC COAST COLLIERY CO.
See Pacific Coal Syndicate.

PACIFIC COAL SYNDICATE.
General Office, Merritt, B. C.
Nos. 2 and 3 Mines; Shaft and Drift; Nos. 1 and 2 Seams; 5 to 30 ft. thick.
PR—G. I. Wilson,....Vancouver, B. C.
GM—Jos. Graham,......Merritt, B. C.
MS—A. Bryden, " "
S of H—Rope. Track gauge 36 in.
S of M—Hand.
EMP—5. Last fiscal year output, 1,600 tons.
Note—Formerly Pacific Coast Colliery Co.

PACIFIC PASS COAL FIELDS, Ltd (THE)
Now Canadian Coal & Coke Co.

PEMBINA COAL CO, LTD.
Shaft Mine; Seam, 72 to 90 in. thick.
PO—Evansburg, Alta; SP—Same; RR—Grand Trunk Pac., Can. Nor.
PR—H. M. Evans......Evansburg, Alta
GM—M. L. Hyde, " "
PA—M. L. Hyde, " "
MM—Geo. Dickerson, " "
EE—Arthur Dickerson, " "
MS—S. D. Wark, " "
S of H—2 Elec and 2 Storage Batteries, loco.
S of M—4 Elec. mach.
PP—3 Return tubular boilers, total 450 H. P., 2 gen. units, 250 volts D. C., 1 pump.
EMP—120.

PIONEER COAL CO.
Pioneer Mine, Shaft, Tofield Seam 6 to 9 ft. thick.
PO—Tofield, Alta.; SP—Same; RR-Grand Trunk Pacific.
GM—J. J. McDevitt,....Tofield, Alta.
S of M—Hand.
PP—Boiler 20 H. P., 1 pump.
EMP—12 to 24. Last fiscal year output 4,200 tons.

PRAIRIE COAL CO., Ltd.
Bow City Mine; Drift; Seam 60 to 63 in. thick.
PO—Eyremore, Alta.; SP—Brooks, Alta.; RR—Canadian Pacific Ry.
PR—A. Casey, Esq., Drawer 180, Regina, Sask.
TR—C. R. Westgate....Eyremore, Alta.
GM—C. R. Westgate, " "
MS—A. Fox, " "
S of H—Mules.
PP—1 Pump.
EMP—10. Last fiscal year output 5,000 tons.

PRINCETON COAL & LAND COMPANY Ltd
General Office, London, England.
No. 1 Mine, Slope; Yale Mine Seam; 24 ft. thick, top 9 ft., worked.
PO—Princeton, B. C.; SP—Same; RR—Great Northern.
GM—Ernest Waterman, Princeton, B. C.
MS—Francis Glover, " "
EM—Francis Glover, " "
MM—Homer Wells, " "
S of H—Direct rope haulage.

S of M—5 comp. air mach.
PP—1 Air comp.; 1 pump.
Sales Agent, G. H. Whitemass Princeton, B. C.

REDCLIFF BRICK & COAL COMPANY, Ltd
No. 1 Mine Redcliff, Drift; Lignite Seam; 4 ft. 10 in. to 5 ft. thick.
PO—Redcliff, Alta.; SP—Same; Prov. Alberta; RR—C. P. R., Main Line.
PR—Dr. C. H. Kohler, Minneapolis, Minn.
TR—H. M. Owens, " "
GM—E. H. Sellhorn....Redcliff, Alta.
GS—E. H. Sellhorn, " "
PA—E. H. Sellhorn, " "
MS—Robt. Hamilton, " "
EM—Robt. Hamilton, " "
MM—A. Shimmin, " "
S of H—Rope and horses; track gauge 30 in.
S of M—Hand.
PP—2 Return tubular boilers, 2 gen. units.
Last fiscal year output 10,000 tons.

RED DEER VALLEY COAL CO., LTD. ..
Red Deer Valley Mine; Shaft; Sub-Bituminous Seam, 108 to 112 in. thick.
PO—Drumheller, Alta.; SP—Same; RR
PR—Slocum Howland..Drumheller, Alta.
TR—Slocum Howland, " "
MS—D. A. Macaulay " "
EM—D. A Macaulay, " "
S of H—Mules. Track gauge 36 ins.
S of M—Hand.
PP—2 Jenckes boilers, total 300 H. P.; 2 pumps, 1 gen. unit, 240 volts A. C., 3 phase, 60 cycles.
EMP—65. Output 200 tons per day.

ROCK SPRINGS COAL & BRICK CO., Ltd
"Tunnel" or Drift Mine; "Belly River" Seam 34 to 38 in. thick. —Canadian Northern.
PO—Taber, Alta.; SP—Same; RR—C. P. R., Elcan Blast Spur Br.
PR—B. K. Bullock......Taber, Alta.
TR—A. L. Bullock........Taber, Alta.
Secy—A. L. Bullock........Taber, Alta.
PA—C. C. Cook..........Elcan, Alta
MS—C. C. Cook..........Elcan, Alta.
GM—R. J. Lee..........Elcan, Alta.
MGR—Robt. John Lee.
CE—E. S. F. Huntrods....Taber Alta.
EM—A. B. Cook, " "
MM—Herbert Lamb......Elcan, Alta.
S of H—Mules and horses; track gauge 30 in.
S of M—9 comp. air mach.
PP—2 Polson, and 1 John Abell, Return tubular boilers, loco. type, total 400 H. P., 1 comp., 1 pump.
EMP—60. Last fiscal year output 25,000 tons.
Sales Agent, Harstone Bro.s, Winnipeg, Man. Canada and McLean Coal Co. Moose Jaw, Sask.

ROUND HILL COLLIERIES CO., LTD.
Round Hill Collieries Mine; Slope; Lignite Seam; 66 to 78 in. thick.
PO—Round Hill, Alta.; SP—Same; RR—C. N., Calgary Br.
PR—D. Tuomey......Round Hill, Alta.
TR—J. Tuomey, " "
PA—J. Tuomey, " "
Director—G. P. Smith, " "
MS—D. S. Williamson, " "
CE—Norman Fraser, " "
S of H—Mules. Track gauge 24 in.
PP—1 boiler, total 60 H. P., 1 pump.
EMP—40. Last fiscal year output 30,000 tons.

ROSEBY FARMING & DEV. CO.
Brunner Mine, Lignite Seam 3 ft. thick.
PO—Rosebud Creek, Alta.; SP—Same; RR—C. N. R.
GM—R. W. Brunner, Rosebud Creek, Alta.
GS—R. W. Brunner, " "
MS—John Drenskis, " "
S of H—Hand; track gauge 2½ ft.
S of M—Hand.

ROSEDALE COAL & CLAY PRODUCTS CO., LTD.
Mine No. 1 and 2, Drift, No. 1, Shaft No. 2; Upper and Lower Seam; 3 ft. 8 in. to 11 ft. thick.
PO—Rosedale Alta.; SP—Moodie's Siding, Alta. RR—C.N.R., Goose Lake, Br.
PR—W. Georgeson ....Calgary, Alta.
TR—W. Carson, " "
GM—J. F. Moodie......Rosedale, Alta.
MS—J. F. Moodie, " "
MM—K. Moodie, " "
EE—K. Moodie, " "
CE—B. W. Dunn......Calgary, Alta.
EM—B. W. Dunn, " "
S of H—Mules Will have elec. and comp air locos.
S of M—Hand.
PP—1 Boiler, 1 pump.
EMP—60. Last fiscal year output 27,000 tons.
Sales agent, Great West Coal Co., Brandan, Man., J. R. Brodie.

ROSE DEER COAL MNG. CO., LTD. (THE)
General Office, Galgary, Alta.
Controls 6,069 acres Slope Mine; Seam 60 to 84 in. thick.
PO—Wayne, Alta; SP—Drumheller, Alta; RR—Canadian Northern.
PR—Vital Raby........Calgary, Alta.
TR—Chas. S| Smith..Saskatoon, Sask.
GM—Geo. V. Tupper...Drumheller, Alta
MS—D. Grey...........Wayne, Alta
EM—D. Grey, " "
S of H—Rope. Track gauge 36 in.
S of M—1 Comp. air machine.
PP 2 boilers, 300 H. P., 1 gen. unit, 70 K. W., 220 Volts A. C., 3 phase, 60 cycles, 1 air comp.
EMP—40. Last fiscal year output 21,000 tons.

ROTHWELL COAL CO., LTD.
Rothwell Mine, Shafts; Seam 17 to 24 in. thick.
PO—Rothwell, N. B.; SP—Minton, N. B.; CTY—Queens; RR—C. P. R.
PR—H. C. Schofield, St. John, N. B
GS—W. B. Evans......Rothwell, N. B
S of M—Hand.

ROYAL COAL CO.
Riverside Mine; Slope; Lawson Seam; 3½ to 5 ft. thick.
PO—Maccan, N. S. SP—Same; CTY—Cumberland; RR—Joggins.
PR—John T. Smith....Amherst, N. S
TR—C. R. Smith, " "
GM—L. S. Betts........Maccan, N. S.
S of H—Comp. air.
S of M—Hand.
PP—2 Babcock & Wilcox water tube boilers, total 500 H. P., 1 pump.
EMP—12. Last fiscal year output 2,000 tons.

ROYAL COLLIERIES CO., LTD.
PR—A. C. Flumerfelt. Royal View, Alta.
VP—A. Laidlaw, " "
GM—H. N. Galer, " "

ST. ALBERT COLLIERIES, LTD.
Now Canadian Coal & Coke Co.

STERLING COAL COMPANY, LTD.
General Office, Drumheller, Alta., Can.
Sterling Mine; Shaft; No. 4 Drumheller Seam; 24 to 54 in. thick.
PO—Drumheller, Alberta, Canada; SP—Same; RR—Canadian Northern, Winnipeg—Saskatoon—Calgary branch.
PR—G. G. Jewell, Drumheller, Alta., Canada.
MS—Thomas M. McGuckie, Drumheller, Alta., Canada.
MM—Martin Potter, " "
S of H—Mules. Track gauge 36 in.
S of M—3 comp. air machines.
PP—One air compressor, two pumps.
EMP—40.

SUNLIGHT & WHITE FLAG MINES.
Sunlight Mine, Drift, Seam 5 to 7 ft. thick.
PO—Highland, Alta. SP—Same, RR—C.N.R. Goose Lake Branch.
MS—A. F. Zoberg, .. Highland, Alta.
S of H—Gravity. Track gauge 24 in.
S of M—Hand. Last fiscal year output, 1,000 tons.

SUPERIOR COAL CO., LTD.
Nos. 1 and 2 Mines; Drift; Belly River Seam, 4 ft. to 4 ft. 4 in. thick.
PO—Taber, Alta; SP—Same; RR—C. P. R.
PR—B. K. Bullock .... Taber, Alta.
PA—H. Y. Parker.........Taber, Alta.
GM—H. Y. Parker ....Taber, Alta.
MS—H. Y. Parker........Taber, Alta.
TR—C. L. Parker........Taber, Alta.
MM—Robert John Lee, " "
EM—A. Stokes...........Taber, Alta.
MM—Awrey Rice....Mericine Hat, Alta.
S of H—Mules and horses; track gauge 30 in.
S of M—6 Comp. air mach.
PP—1 Babcock & Wilcox boiler, 200 H. P.
EMP—50. Last fiscal year output 12,000 tons.

SYDNEY COAL CO.
General Office, 10 Fremont S., Boston, Mass.
Indian Cave Mine Slope Indian Cave of No. 3 Seam, 5 ft. thick.
PO—Sydney Mines, C. B.;
PR—Samuel C. Bennett, 10 Fremont St., Boston, Mass
TR—Edward M. Beals, " "
GM—Hugh G. Campbell, North Sydney
MS—Hugh G. Campbell, " "

PP—1 Return tubular boiler, 25 H. P.
S of H—Rope; track gauge 3 ft.
S of M Hand.
EMP—25. Last fiscal year output 8,000 tons.

TOFIELD COAL CO., LTD.
General Office, Edmonton, Alta.
Tofield Mine; Stripping; Seam, 72 to 120 in. thick.
PO—Tofield. Alta.; SP—Same; RR—G. T. Pac., Tofield, Calgary, Br.
PR—Robert Lee.......Edmonton, Alta.
TR—Claude Gallinger, " "
GM—Claude Gallinger, " "
MS—Wm. J. Morton......Tofield, Alta.
S of H—Mules.
S of M—Hand.
PP—2 Pumps.
EMP—53. Last fiscal year output, 27,640 tons.

TWIN CITY COAL CO., LTD.
Twin City Mine; Shaft; Lignite Seam; 60 to 81 in. thick.
PO—Edmonton, South; Alberta; SP—Same; RR—C. N. R.
PR—R. L. McIntyre......Toronto, Ont.
TR—J. Sinclair, "
GM—H. C. Anderson, Edmonton, So. Alta
EM—L. C. Stevens, " "
S of H—Mules; track gauge 24 in.
S of M—6 Comp. air mach.
PP—1 Water tube and 1 Return tubular boilers, total 180 H. P., 2 comp., 1 pump.
EMP—100. Last fiscal year output 48,000 tons.

VANCOUVER-NANAIMO COAL MINING CO., LTD.
General Office, Pacific Bldg., Vancouver, B. C.
East Wellington No. 1 Mine; Slope; Wellington Seam, 36 to 180 in. thick.
PO—Box 834 Nanaimo, B. C.; SP—Newcastle Siding; RR—C. P. R.
PR—H. W. Maynard..Vancouver, B. C.
GM—H. W. Maynard, " "
TR—J. L. G. Abbott, " "
GS—H. N. Freeman, Nanaimo, B. C.
EM—H. N. Freeman, " "
MM—H. Hewer " "
SCO—Address the Company. Buyer, H. Anchiwale, Nanimo, B C.
S of H—I Steam loco. and mules; track gauge 56 1-2 in.; underground track 39 in.
S of M—Hand.
PP—5 Return tubular boilers, total 321 H. P., gen. unit, 110 volts D. C., 2 compressors, 5 pumps.
EMP—180. Last fiscal year output, 46,000 tons.

VULCAN COAL CO., LTD.
General Office, Calgary Alta.
Drift, Edmonton Seam.
PO—Drumheller, Alta. SP—Same. RR—Canadian Northern.
PR—A. J. Sayre........Calgary, Alta.
TR—E. R. Mosher, " "
Mine not operating

WALKER, JAS.
Walker Mine, Slope; "Lignite" Seam, 10 to 14 ft. thick.
PO—Sheerness, Alta.; SP—Rickdale, Alta.; RR—C. N. R.
PR—James Walker....Sheerness, Alta.
GM—James Walker, " "
MS—Julius Werueboldt " "
EM—Smith & Cote, " "
S of H—Rope; track gauge 26 in.
S of M—Hand.
PP—Frost Boiler, total 35 H. P., 1 gen. unit, 1 pump.
Last fiscal year output 6,000 tons.

WEST CANADIAN COLLIERIES, Ltd.
Blairmore, Lille, Bellevue and Greenhill Mines; Operate Washery.
PO—Blairmore, Alta; SP—Same and Hillcrest; RR—C. P., Crows Nest Pass Branch.
PR—A. Wicart, ...Lille, France
CM—J. Charbonnier, Blairmore, Alta.
CS—R. Green, ..." "
PA—G. A. Lavoie, " "
S of H—8 Comp. air mach; track gauge 36 in.
S of M—Hand.
PP—Boilers, 1,200 H.P., gen. unit 2,300 volts A.C., 2 compressors.
Coke ovens—50 Rectangular.

WESTERN FUEL CO.
General Office, San Francisco, Cal.
No. 1, Northfield and Reserve Mines; Shafts; Douglas and New Castle Seams; 48 to 300 in. thick. Operate washery.
PO—Nanaimo, B.C.; SP—Same; RR—E. & N., C. P., G. N.
PR—John Lawson, San Francisco, Cal.
TR—S. V. Smith, " " "
GM—Thos. R. Stockett, Nanaimo, B.C.
GS—Thos. R. Stockett, " "
PA—W. J. Pollock, " "
MS—John Hunt, " "
EM—J. T. Hepburn, " "
MM—A. G. Hamilton, " "
EE—J. G Harrison, " "
S of H—Mules, rope, 6 elec. and 5 steam loco. Track gauge 30, 42 and 56¼ in.
S of M—50 Comp. air mach.
PP—2 Babcock & Wilcox water tube boilers and 20 return tubular boilers, total 2,600 H. P., 6 comp.
EMP—1,137. Last fiscal year output 465,610 tons.

WHITE ASH COLLIERIES, LTD.
Slope Seam, 48 in. thick.
PO—Taber, Alta. SP—Same. RR—C.P.R.
PR—W. E. Bullock, ... Taber, Alta.
GM—W. E. Bullock, " "
PA—W. E. Bullock, " "
VP—Roy Bullock, " "
TR—W. Lowe............Taber, Alta.
MS—John Marsh, " "
CE—E. S. F. Huntroids, " "
EM—E. S. F. Huntroids, " "
MM—W. Doncumbe, " "
EE—W. Doncumbe, " "
S of H—Mules. Track gauge, 30 in.
S of M—6 Compressed Air Machines.
PP—Leonard boilers, total 300 H. P., 1 Air comp., 2 pumps. Sales agent, Jas. Budd, Taber, Alta.

YELLOWHEAD PASS COAL & COKE CO. LTD.
General Office........ Montreal, Que.
PR—M. J. O'Brien " "
VPR—M. Doheny, " "
TR—F. W. Rous, " "
GM—Donald McKay....Bickerdike, Alta.
MS—F. B. Smith, " "
MM—H. Ryan, " "
Control 8,515 acres of land. Tipple capacity 500 tons per day.
This company is now under proccss of liquidation.

COLORADO

For List of Abbreviations See Page 622.

ALLIANCE COAL CO.
General Office, Denver, Colo.
Reliance Mine, Slope; Seam 8 to 11 ft. thick.
PO—Ojo, Colo.; SP—Same; CTY—Huerfano. RR—D. & R. G.
PR—D. A. Cannon....Denver, Colo.
PA—D. A. Cannon, " "
MS—Jas. G. McDowell.......Ojo, Colo.
S of H—Mules and rope.
S of M—Hand and 3 comp. air mach.
PP—4 Water tube boilers total 450 H. P.; 1 air comp.; 4 pumps.
EMP—100. Last fiscal year output 79,230 tons

AMADOR COAL COMPANY.
Out of business.

AZTEC COAL MINING CO.
General Office, Walsenburg, Colo.
Toltec Mine; Slope; Walsen, Robinson & Cameron Seams; 36 to 48 in. thick.
PO—Toltec, Colo; SP—Orman; CTY—Huerfano; RR—D. & R. G.
PR—George Fruth........Denver, Colo.
GM—George Fruth, " "
MS—S. B. Smith........Toltec, Colo.
CE—S. M. Thompson..Walsenburg, Colo.
SCO—Huerfano Trading Co. " "
S of H—Rope. Track gauge 36 in.
S of M—3 elec. and 3 comp. air mach.
PP—4 return tubular boilers, total 360 H. P., 1—250 H. P., Chuse engine, 440 volts A. C., 3 phase, 60 cycle, 1 pump and 1 air comp.
EMP—100. Last fiscal year output 44,000 tons. Sales agent, G. R. Houghtelin, Walsenburg, Colo.

BALDY COAL COMPANY, THE
Note—Not operating at present.

BALDWIN FUEL CO.
General Office, 850 Equitable Bldg., Denver, Colo.
Baldwin Star Mine; Slope 72 to 84 in. thick.
PO—Baldwin, Colo.; SP—Gunnison City, Colo.; CTY—Gunnison; RR—D. & R. G., Cooper Spur.
PR—H. E. McElwain.....Baldwin, Colo.
TR—Jas. Giedlartz, " "
GM—James Hare, ..." "
PA—James Hare, " "
MS—James Hare, " "
CE—Frank Bulkley, " "
SCO—Address the Company. Buyer, James Hare, Baldwin, Colo.
S of H—Gravity. Track gauge 30 ins.
S of M—Hand.
EMP—20. Last fiscal year output 10,000 tons.

BEAR CANON COAL CO., (THE)
General Office, Trinidad Colo.
Bear Canon Mine, Drift, "Camron" Seam; 3 ft. 8 in. to 4 ft. 10 in. thick.
PO—Toller, Colo.; SP—Same; CTY—Las Animas. RR—C. & S., Berwind Br.
PR—J. J. J. Abercrombie, Trinidad, Colo.
GM—J. J. J. Abercrombie, " "
GS—J. J. J. Abercrombie, " "
PA—J. J. J. Abercrombie, " "
TR—P. D. Miller, Iowa City, Iowa.
S of H—Mules; track gauge 36 in.
S of M—Hand.
Sales Agent, J. J. J. Abercrombe, Trinidad, Colo.

BEAR RIVER COAL CO.
General Office, Denver, Colo.
Bear River Mine; Slope; Pinnacle Seam, 109 to 168 in. thick.
PO—Bear River, Colo.; SP—Same; CTY—Routt; RR—D. & S. L.
PR—Geo. N. Sparling....Denver, Colo.
TR—W. T. Mayfield, " "
MS—Dave Lewis......Bear River, Colo.
SCO—Bear River Merc. Co., Bear River, Colo.
S of H—Rope; track gauge, 36 in.
S of M—Hand.
PP—2 Return tubular boilers, total 250 H. P., 1 pump.
EMP—27. Output from July, 3,553 tons. New company.

BIG FOUR COAL & COKE CO., (THE)
General Office, Denver, Colo.
PR—P. M. Peltier......Denver, Colo.
GM—P. M. Peltier, " "
Sales agent, W. H. Peltier, " "

Big Four Mine; Slope; Robinson Seam, 4½ to 9 ft. thick
PO—Tioga, Colo., SP—Big Four; CTY—Huerfano; RR—D. & R., G., C. & S
MS—Robert Hood.........Tioga, Colo.
S of H—Rope and gasoline loco.; track gauge 36 in.
S of M—12 Sullivan. comp. air mach. and 2 Elec. mach.
PP—5 water tube boiler, total 750 H. P., 2 comp. and 2 pumps.
EMP—80. Last fiscal year output 43,000 tons.

Centennial Mine; Shaft; Louisville Seam 5 ft. thick.
PO—Louisville Colo.; SP—Same; CTY—Boulder; RR—C. & S.
MS—H. B. McFadden, Louisville, Colo.
S of H—Mules, rope and gasoline loco.; track gauge 36 in.
S of M—1 Comp. air mach. and hand.
PP—3 Heine, Kewanee water tube boilers, 1 Norwalk comp., 2 pumps.
EMP—70. Last fiscal year output 55,000 tons.

BIG LAKE FUEL COMPANY
Big Lake Mine; Shaft; 60 to 96 in. thick.
PO—Lafayette, Colo.; SP—Same; CTY—Boulder; RR—C. & S.
PR—W. J. McGowan...Lafayette, Colo.
PA—W. J. McGowan, " "
GS—W. J. McGowan, " "
TR—P. H. Balfe, " "
MS—J. H. Vincent, " "
CE—Thomas Knill, " "
S of H—Elec. loco.
S of M—One elec. mach.
PP—1 boiler, total 80 H. P., 2 pumps.

BIG SIX COAL CO.
Sunnyside Mine, Shaft, Lignite Seam 50 to 59 in. thick.
PO—Louisville, Colo., SP—Same; CTY—Boulder; RR—Colo. & Sou.
PR—J. A. Carveth.....Louisville, Colo.
TR—F. N. Carveth, " "
GM—J. A. Carveth, " "
PA—J. A. Carveth, " "
MS—F. N. Carveth, " "
SCO—Carveth Bros. & Dalby; SB—G. A. Dalby.
S of H—Mules; track gauge 30 in.
S of M—Hand and 4 comp., air mach.
PP—3 H. & B. water tube boilers, total 312 H. P., 1 American and 1 Ing-Sergeant air comp., 1 Cameron pump.
EMP—38. Last fiscal year output 24,000 tons.
Sales Agent, J. A. Carveth, Louisville, Colo.

BLACK CANON COAL & FUEL CO.
General Office, Denver Colo.
Caddell Mine, Slope, Robinson Seam 3½ to 4 ft. thick.
PO—Walsenburg, Colo.; SP—Caddell; CTY—Huerfano; RR—D. & R. G., C. & S.
PR—John Q. Royce....Denver, Colo.
GM—John Q. Royce, " "
PA—John Q. Royce, " "
TR—Talton F. Crane....Denver, Colo.
MS—Robert Curry, Walsenburg, Colo.
S of H—Rope; track gauge 3 ft.
S of M—Hand and 2 Sullivan elec. mach.
PP—1 Elec. hoist, 2 gen. units 440 volts A. C., 3 cycles. Power purchased.
EMP—80. Last fiscal year output 15,000 tons.

BLACK DIAMOND NIGGERHEAD COAL & MINING CO.
Niggerhead Mine; Drift; 48 in. thick.
PO—Tollerberg, Colo.; SP—Berwind, Colo.; CTY—Las Animas; RR—C. & S.
PR—J. E. McLaughlin, Tollerb rg, Colo.
GM—J. E. McLaughlin, " "
GS—J. E. McLaughlin, " "
TR—G. A. McLaughlin, " "
EM—Hal Barnes.......Trinidad, Colo.
S of M—Hand
PP—Purchase power.

BOOK CLIFF R. R. CO., (THE)
Book Cliff Mine, Drift; Seam 14 ft. work 7 ft.
PO—Grand Junction, Colo.; SP—Same; CTY—Mesa.; RR—The Book Cliff
PR—John W. Raymond, Grand Junc. Colo.
TR—D. B. Wright, " "
GM—D. B. Wright, " "
PA—D. B. Wright, " "
MS—T. E. Sanford, " "
SM—T. E. Sanford, " "
MM—C. F. Lass, " "
S of H—Mules and 2 steam locos.; track gauge 36 in.
S of M—Hand.

BREEN COAL MINING CO., THE
Breen Mine, Slope; Walsen Seam, 60 to 72 in. thick.
PO—Walsenburg, Colo.; CTY—Heurfano, RR—Colo. & Southern. D.&R.G.
PR—John P. Breen..Walsenburg, Colo.
PA—Martin T. Brennan, " "
GM—Martin T. Brennan, " "
S of H—Electric hoists; track gauge 3 ft.
S of M—2 Elec. mach.
PP—Purchase power
EMP—35. Last fiscal year output 4,599 tons.
Sales Agent, Rugby Fuel Co., Denver, Colo.

BROOKS-HARRISON FUEL CO., THE
Nonpareil Mine, Shaft; Seam 60 to 108 in. thick.
PO—Louisville, Colo.; SP—Same; CTY—Boulder; RR—C. & S.
PR—James E. Brooks, Louisville, Colo.
TR—James E. Brooks, " "
GM—James E. Brooks, " "
PA—James E. Brooks, " "
EM—Geo. E. Wilson....Boulder, Colo.
MS—A. Viggers........Louisville, Colo.
MM—A. Viggers......Louisville, Colo.
S of H—Mules; track gauge 36 in.
S of M—3 Comp. air mach.
PP—3 Boilers, toal 300 H P., 3 comp., 3 pumps.
EMP—20. Last fiscal year output 18,055 tons.
Sales Agent, James E. Brooks.

BROOKSIDE COAL MINING CO.
Brookside Mine, Semi-Bituminous, Seam 6 ft. thick.
PO—Canon City, Colo.; SP—Same; CTY—Fremont; RR—A. T. & S. F.;
PR—John Lippis....Canon City, Colo.
GM—John Lippis.....Canon City, Colo.
MS—John Lippis, " "
TR—Uboldi Moschetti, " "
MM—Ronco Moschetti, " "
EE—Bud Holland, " "
EM—J. Q. McNatt........Pueblo, Colo.
S of H—Elec. loco.
S of M—1 Elec. mach.
PP—2 Boilers, 1 gen. unit 250 volts D. C., 1 pump.
EMP—13. Lat fiscal year output 9,489 tons.

CALUMET FUEL CO., THE
General Office, 901-2 Equitable Bldg., Denver, Colo.
Perins Peak Mine, Drift; 5 ft. thick.
PO—Perins, Colo.; SP — Durango, Colo.; CTY—La Plata.; RR—Rio Grande Southern, Calumet Br.
PR—A. H. Cowie, Judge Bldg., Salt Lake, Utah.
TR—E. R. Dickenson....Denver, Colo.
GS—W. C. Ferguson, " "
PA—W. C. Ferguson " "
MS—M. T. Lomason......Perins, Colo.
..**SM**—John Meston, " "
MM—M. T. Lomason, " "
S of H—Elec.; track gauge 3 ft.
S of M—Hand.
PP—Purchase power.
EMP—95. Last fiscal year output 50,868 tons.
Sales Agent, W. C. Ferguson, Denver, Colo.

CANON COAL CO.
Florence, Colo. No report.

CARBON COAL CO.
Durango, Colo. No report.

CARBON COAL AND COKE CO.
General Office, Denver, Colo.
PR—L. G. Eakins.........Denver, Colo.
GM—L. G. Eakins, " "
TR—W. A. Johnston, " "
CE—F. D. Baker " "
PA—A. G. Bown, " "
GS—D. D. Dodge....Cokedale, Colo.
EM—H. H. Bubb, " "
MM—R. B. West, " "
EE—G. V. Hughes, " "
SCO—Gottlieb Merc. Co., " "

Cokedale Mine; Slope; Seam 4 to 7ft. thick; washery
PO—Cokedale, Colo.; SP—Same; CTY—Las Animas; RR—D. & R. G.
S of H—4 Elec. loco. and mules
S of M—Elec. mach. and hand.
EMP—400 Coke ovens 350 Bee Hive

San Juan Mine; Slope; Seam 3 to 5 ft. thick.
PO—Durango, Colo.; SP—Same; CTY—San Juan; RR—D. & R. G.
MS—F. C. Gilbert......Durango, Colo.
S of H—Rope.
S of M—Hand.
EMP—30. Coke ovens, 14 Bee Hive. Consume own coal

CARBON FUEL AND IRON COMPANY.
Grant Mine; Shaft; 120 to 132 in. thick;
PO—Frederick, Colo; SP—Same; CTY—Weld; RR—Union Pacific.
PR E. Horstman, Foster Bldg., Denver, Colorado.
TR—J. P. Brackett, Foster Bldg., Denver Colo.
GM—D. W. Brown, Foster Bldg., Denver, Colo.
GS—G. T. Peart, Foster Bldg., Denver Colo.
PA—G. A. Easterly, Foster Bldg., Denver Colo.
MS—Evan Jones, Frederick, Colo.
S of H—Mules.
S of M—1 elec. mach.
PP—1 Return tubular boiler, 1 pump. Power purchased.
EMP—20. Last fiscal year output, 8,246 tons.

CARBONADO COAL MINING CO.
See Vesta Coal Mining Co.

CEDAR HILL COAL & COKE CO.
General Office, Denver, Colo.
PR—D. M. Harrington..Denver, Colo.
GM—D. M. Harrington " "
PA—D. M. Harrington, " "
TR—J. M. Anderson, " "
GS—Robt. O'Neil.......Trinidad, Colo.
CE—M. O. Danford....Trinidad, Colo.
MM—Donald Young....Tollerburg, Colo.
EE—Donald Young, " "
Sales Agent, D. M. Harrington, Denver, Colo.

Black Diamond Mine, Slope; "Cameron" Seam; 3 to 4 ft. thick.
PO—Rapson, Colo.; SP—Rugley, Colo.; CTY—Las Animas; RR—C. & S.
MS—H. F. Tennant, Tollerburg, Colo.
S of H—Rope and Mules; track gauge 36 in.
S of M—Hand.
PP—3 Water tube boilers, total 140 H.P.
EMP—60.

Toller Mine Shaft; "Berwind" Seam; 5½ to 8 ft. thick.
PO—Tollerburg, Colo.; SP—Toller, Colo.; CTY—Las Animas; RR—C. & S.
MS—H. F. Tennant, Tollerburg, Colo.
S of H—Rope and Mules; track gauge 36 in.
S of M—Hand.
PP—2 Erie water tube boilers, total 200 H. P., 440 volts, A C., 3 phases, 60 cycles; elec. power purchased, 1 pump.
EMP—200.

Greenville Mine, Slope; "Berwind" Seam, 5 to 8 ft. thick.
PO—Ludlow, Colo.; SP—Tabasco, Colo.; CTY—Las Animas; RR—C. & S.
MS—H. F. Tennant, Tollerburg, Colo.
S of H—Rope and Mules; track gauge 40 in.
S of M—Hand.
PP—3 Water tube boilers total 150 H. P., 440 volts, A. C. 3 phases, 60 cycles; elec. power purchased.
EMP—105.

CHICOSA FUEL CO.
General Office, Foster Bldg., Denver, Colo.
Forbes Mine, Slope; "Hastings" Seam; 4 to 8 ft. thick.
PO—Forbes, Colo.; SP—Forbes Junction, Colo.; CTC—Las Animas; RR—C. & S.
PR—D. W. Brown......Denver, Colo.
TR—J. J. Roche " "
GS—Geo. T. Peart, " "
PA—G. A. Easterly, " "
MS—Henry Dalby.........Forbes, Colo.
SM—K. E. Cowdery, " "
EM—Ralph Shumway....Denver, Colo.
FE—John Hawthorne..Lafayette, Colo.
SCO—Rocky Mountain Stores Co., Buyer, E. Horstman, Denver, Colo.
S of H—Rope and mules; track gauge 36 in.
S of M—Hand and 4 elec. mach.
PP—1 Return tubular boiler total 75 H. P., 250 volts D. C., 4 pumps.
GM—Asst. R. J. Matteson, " "
EMP—100.
Sales Agent, C. W. Hood, Denver, Colo.

COLORADO FUEL & IRON CO. (THE)
General Office, Denver Colo.
27 Mines, 8 coke oven plants.
General Office, Denver, Colo.
PR—J. F. Welborn......Denver, Colo.
TR—J. A. Writer, " "
GM—J. B. McKennan.....Pueblo, Colo.
MGR—E. H. Weitzel, " "
PA—S. G. Pierson.......Denver, Colo.
ASST MGR—B. J. Matteson, Pueblo, Colo.
MM—B. J. Matteson, " "
EE—Geo. S Thompson....Pueblo, Colo.
Supt 1st Div.—J. P. Thomas Trinidad, Colo.
Mine Inspector—Robert McAllister Trinidad, Colo.
Boiler Inspector—W. S. Thomas, Trinidad, Colo.
Supt. of Washeries—F. C. Miller, Trinidad, Colo.
SM—Colorado Supply Co., Buyer, S. G. Pierson, Denver, Colo.
Sales Agent, J. Chilberg, Denver, Colo.

Cornell Mine; Slope; Seam 9 ft. thick.
PO—Tercio, Colo.; SP—Same; CTY—Las Animas; RR—Colo. and Wyoming.
MS—W. E. Thomas......Tercio, Colo.
S of H—Mules and rope; track gauge 36 in.
S of M—Hand.

PP—1 Return tubular boiler 80 H.P. 1 pump.

Engle Mine; Drift; Seam 66 in. thick.
PO—Eagle, Colo.; SP—Engleville, Colo. CTY—Las Animas; RR—D.&R.G.
S of H—1 Steam loco and mules and rope; track gauge 36 in.
S of M—Hand.
PP—6 Return tubular boilers, total 450 H. P.

Floresta Mine; Drift; Seam, 3½ ft. thick.
PO—Floresta, Colo.; SP—Crested Butte, Colo.; CTY—Gunnison; RR—D. & R. G., Floresta Br.
MS—Wm. Manley.......Floresta, Colo.
SM—M. B. Moscon......Floresta, Colo.
S of H—2 Gasoline loco., mules and rope; track gauge 36 in.
S of M—Hand.
PP—1 Water tube, 3 return tubular boilers, total 375 H. P., 1 lighting plant, 110 volts D. C., 1 air comp.
EMP—125. Last fiscal year output 35,867 tons.

Marion Mine; Drift; Seam, 6 ft. thick.
PO—Gulch, Colo.; SP—Marion, Colo.; CTY—Pitkin; RR—Colo. & Midland.
MS—H. J. Elliott........Gulch, Colo.
S of H—Mules and rope; track gauge 36 in.
S of M—Hand.
PP—2 Return tubular boilers, total 160 H. P.
EMP—10.

Gulch Mine; Slope; Seam, 8 ft. thick.
PO—Gulch, Colo.; SP—Same; CTY—Pitkin; RR—Colo. & Midland, Gulch Br.
MS—A. H. Robinson....Gulch Colo.
MS—H. J. Elliott........Gulch, Colo.
S of H—1 Elec. loco., mules and rope track gauge 36 in.
S of M—Hand.
PP—6 Return tubular boilers, total 370 H. P.., 2 gen. units, 250 volts D. C., 2 pumps.
EMP—60. Last fiscal year output 59,427 tons.

Crested Butte Mine; Slope; Seam 10 ft. thick.
PO—Crested Butte, Colo.; SP—Same; CTY—Gunnison; RR—D. & R. G., Crested Butte Br.
MS—Wm. Manley....Crested Butte, Colo.
SM—J. V. McClenathan, " "
S of H—Mules and rope; track gauge 36 in.
S of M—Hand.
PP—7 Return tubular boilers total 700 H. P., 1 lighting plant, 110 volts D. C., 2 comp. and 1 pump.
EMP—135. Coke ovens 154 Bee Hive.
Note—Idle at present.

Berwind Mine; Drift; Seam 4½ ft. thick.
PO—Berwind, Colo.; SP—Same; CTY—Las Animas; RR—Colo. & Sou.
MS—Jas. Wilson........Berwind, Colo.
SM—F. J. Young, " "
S of H—7 Elec. loco., rope and mules track gauge 36 in.
S of M—Hand.
PP—4 Return tubular boilers, total 350 H. P., 550 volts D. C., from Tabasco Mine, 2 pumps
EMP—300 Last fiscal year output 124,587 tons.

Tabasco Mine; Slope; Seam, 5½ ft. thick; operate washery.
PO—Tabasco, Colo.: SP—Same; CTY—Las Animas; RR—Colo. & Sou.
MS—Jas. Wilson........Tabasco, Colo.
SM—M. P. Ferguson " "
S of H—1 Elec. loco, 4 Elec. larry. cars, mules and rope; track gauge 36 in.
S of M—Hand.
PP—12 Return tubular boilers, total 1160 H. P., 4 gen. units 550 volts D. C.
EMP—262. Coke ovens, 302 Bee Hive. Last fiscal year output 154,202 tons.

Rouse Mine; Slope; Seam 6 ft. thick.
PO—Rouse, Colo.; SP—Same; CTY—Huerfano; RR—D. & R. G., Rouse Branch.
MS—W. G. Deck.......Rouse, Colo.
SM—B. G. Rodda..........Rouse, Colo.
S of H—Mules and rope; track gauge 36 in.
S of M—Hand.
PP—6 Return tubular boilers total 600 H. P., 3 gen. units 440 volts A. C, 3 phase, 25 cycles; 4 pumps.
EMP—230. Last fiscal year output 161,140 tons.

Lester Mine; Slope; Seam, 6½ ft. thick.
PO—Lester, Colo.; SP—Same; CTY—Huerfano. RR—D. & R. G.
MS—W. G. Deck.......Rouse, Colo.
SM—C. S. Bergh........Lester, Colo.
S of H—Mules and rope; track gauge 36 in.
S of M—Hand.
PP—6 Return tubular boilers, total 600 H. P. 440 volts A. C., 3 phases and 60 cycles; buy elec power, 2 pumps.
Last fiscal year output 103,643 tons.
Note—Idle at present.

Ideal Mine; Drift; Seam, 3½ ft. thick.
PO—Ideal, Colo. SP—Same. CTY—Huerfano; RR—Colo. & Sou.
MS—W. J. Tyson........Ideal, Colo.
SM—A. M. Ross, " "
S of H—Mules and rope; track gauge 36 in.
S of M—4 Elec. mach and hand.
PP—From Rouse mine, 250 D.C. and 440 volts A. C., 3 phase 25 cycles.
EMP—140. Last fiscal year output 81,769 tons.
Cameron Mine; Slope; 4 ft. thick.
PO—Farr, Colo.; SP—Walsenburg, Colo. CTY—Huerfano; RR—Colo. & Sou.
MS—C. A Kaiser........Farr, Colo.
SM—V. L. Skinner, " "
S of H—Mules and rope; track gauge 36 in.
S of M—6 Elec. mach. and hand.
PP—Power purchased. 550 volts, D. C., 440 volts A. C., 3 phase 25 cycles; 1 pump
EMP—130. Last fiscal year output 118,545 tons.

Walsen and Robinson Mines; Slopes; Seam 5 ft. thick.
PO—Walsen, Colo.; SP—Walsenburg, Colo.; CTY—Huerfano; RR—Colo. & Sou, D. & R. G.
MS—Wm. Getchell.......Walsen, Colo
SM—C. S. Buckland......Walsen, Colo.
S of H—1 Elec. loco., rope and mules. track gauge 36 in.
S of M—13 Elec. mach.
PP—2 return tubular boilers. total 160 H. P., 440 volts, 3 phase, 25 and 60 cycle. Power purchased.
EMP—400. Last fiscal year output 303,951 tons.

McNally Mine; Shaft; Walsen and Robinson Seam, 5½ ft. thick.
PO—Walsenburg, Colo.; SP—Same; CTY Huerfano; RR—Colo. & Sou.
S of H—Mules and rope; track gauge 36 in.
S of M—2 Elec. mach. and hand.
PP—1 Return tubular boiler 100 H. P., 550 volts D. C.
Note—Idle.

Pictou Mine; Slope; Seam, 4 ft. thick; operate washery.
PO—Pictou, Colo.; SP—Same; CTY—Huerfano; RR—D. & R. G., Loma Branch.
MS—John Shaw..........Pictou, Colo.
SM—W. C. H. Reeder. " "
S of H—Mules and rope; track gauge 36 in.
S of M—3 Elec. mach. and hand.
PP—6 return tubular boilers, total 600 H.P., 1 rotary converter, 575 D. C., 440 A. C., 6 phase, 60 cycles; 5 pumps; elec. power purchased.
EMP—15.

Coal Creek Mine; Shaft; Seam 4 ft. thick.
PO—Coal Creek, Colo.; SP—Rockvale, Colo.; CTY—Fremont; RR—A. T. & S. F.
MS—Ben Beach.....Coal Creek, Colo.
SM—T. W. Abbott, " "
S of H—Mules and rope; track gauge 36 in.
S of M—Hand.
PP—1 M. G. Gen. Set, 250 volts D. C., 440 volts A. C., 3 phase, 30 cycles, 2 pumps; power purchased.
Last fiscal year output 45,732 tons.
Note—Idle at present.

Rockvale; Shaft; Seam 4 ft. thick.
PO—Rockvale, Colo.; SP—Same; CTY—Fremont; RR—A. T. & S. F.
MS—Harry John,......Rockvale, Colo.
SM—G. Olson, " "
S of H—Mules and rope; track gauge 40 in.
S of M—Hand.
PP—4 Return tubular boilers, total 290 H. P., 440 volts A. C., 30 cycles, 3 pumps, power purchased.
EMP—340. Idle during past year.

Fremont Mine, Shaft; Seam 4 ft. thick.
PO—Williamsburg, Colo.; SP—Florence, Colo.; CTY—Fremont; RR—D. & R. G.
MS—W. J. Davis..Williamsburg, Colo.
S of H—Mules and rope; track gauge 36 in.
S of M—Hand.
PP—4 Return tubular boilers, total 500 H. P., 1 gen. unit 250 volts D. C., 2 pumps
EMP—40. Last fiscal year output 7,276 tons. Idle at present.

Nonac Mine; Slope; Seam, 5½ ft. thick.
PO—Canon City, Colo.; SP—Same; CTY—Fremont; RR—A. T. & S. F.
MS—David Griffiths, Canon City, Colo.
S of H—Mules and rope; track gauge 36 in.
S of M—Hand.
PP—1 Return tubular boiler 100 H. P., 440 volts A. C., 3 phase, 30 cycles, 1 pump, elec. power purchased.
EMP—10.
Note—Idle at present.

Primero Mine; Drift and Slope; Seam, 5 ft. thick.
PO—Primero, Colo.; SP—Same CTY—Las Animas; RR—Colo. & Wyoming.
MS—Jos. Haske.......Primero, Colo.
SM—D. J. Phillips, " "
S of H—6 Elec. loco., rope and mules; track gauge 36 in.
S of M—Hand.
PP—7 Return tubular boilers, total 750 H. P., 2 gen. units 550 volts D. C., 2 pumps.
EMP—450. Last fiscal year output 292,244 tons.

Frederick Mine; Drift; Seam, 5 ft. thick.
PO—Valdez, Colo.; SP—Same; CTY—Las Animas; RR—Colo. & Wyoming.
MS—James O'Neil.......Valdez, Colo.
SM—W. B. Taylor, " "
S of H—3 Elec. loco. and mules; track gauge 36 in.
S of M—Hand.
PP—1 Return tubular boiler 80 H. P., 250 volts D. C., 1 pump, power from Segundo plant.
EMP—330. Last fiscal year output 271,142 tons.

Segundo (Ovens plant)
PO—Segundo, Colo.; SP—Same; CTY—Las Animas; RR—C. & W.
MS—W. E. Danford, Segundo, Colo.
SM—E. O. Nordgren....Segundo, Colo.
S of H—7 elec. Larry cars.
PP—1 Water tube 13 Return tubular boilers, 1800 H. P., 3 gen. units, 250 volts D. C.
EMP—276. Coke ovens, 800. Last fiscal year output 261,161 tons.

Hezron Mine; Slope; Seam, 3½ ft. thick.
PO—Lester, Colo.; SP—Hezron, Colo.; CTY—Huerfano; RR—D. & R. G.
MS—James McGowan.....Hezron, Colo.
S of H—Mules and rope; track gauge 36 in.
S of M—Hand.
PP—440 volts A. C., 3 phase, 60 cycles, power furnished from Rouse Mine.

Morley Mine; Slope and Drift; Seam 5 ft. thick.
PO—Morley, Colo.; SP—Same; CTY—Las Animas; RR—A. T. & S. F.
MS—Chas. Chambers.....Morley, Colo.
SM—H G. Lamme, " "
S of H—4 Elec. loco., rope and mules; track gauge 36 in.
S of M—Hand.
PP—5 Return tubular boilers, 550 H. P., 2 gen. units 250 volts D. C., 3 pumps
EMP—300. Last fiscal year output 198,002 tons.

Starkville Mine; Drift; Seam, 4½ ft. thick; operate washery.
PO—Starkville, Colo. SP—Same. CTY—Las Animas; RR—A. T. & S. F.
MS—Chas. O'Neil, Supt., Starkville, Colo.
SM—H. G. Lamme, Starkville, Colo.
S of H—6 Elec. and 1 steam loco. and mules. Track gauge 40 in.
S of M—Hand.
PP—8 Return tubular boilers total 780 H. P., 2 gen. units, 550 volts D. C.
EMP—245. Coke ovens 100 Bee Hive. Idle during last fiscal year.

Sopris Mine; Drift; 5 ft. thick: operate washery.
PO—Sopris, Colo.; SP—Same; CTY—Las Animas; RR—Colo. & Sou., Colo. & Wyoming.
MS—John Deldosso.......Sopris, Colo.
SM—F. P. Hufford " "
S of H—1 Elec. loco., mules and rope; track gauge 38 in.
S of M—Hand.
PP—6 Return tubular boilers, total 600 H. P., 1 gen. unit, 575 D. C., 440 volts A. C., 3 phase, 60 cycles; power purchased
EMP—465. Coke ovens 272 Bee Hive. Last fiscal year output 160,575 tons.

Tercio Mine, Drift, Seam 6 ft. thick. operate washery.
PO—Tercio Colo.; SP—Same; CTY—Las Animas; RR—Colo. & Wyoming.
SM—H. A. Hott——.......Tercio, Colo.
S of H—1 Gasoline loco. and mules; track gauge 36 in.
S of M—Hand.
PP—8 Return tubular boilers, total 600 H. P., 1 lighting plant, 1100 volts A. C., 3 phase, 60 cycles.
EMP—40. Coke ovens, 600 Bee Hive. Last fiscal year output 34,486 tons.
Note—Idle at present.
Redstone Ovens Plant.
PO—Redstone, Colo., SP—Same; coke ovens, 249 Bee Hive.
Cardiff Oven Plant.
PO—Cardiff, Colo.; SP—Same.
SM—J. H. Wilson......Cardiff, Colo.
Coke ovens, 167 Bee Hive.

COLORADO & UTAH COAL CO.
General Office, Denver, Colo.
Harris Mine; Slope; Middle Vein & Middle Seam; 108 in. thick.
PO—Mt. Harris, Colo.; SP—Same; CTY—Routt; RR—D. & S. L.
PR—Geo. W. Harris......Denver, Colo.
TR—Byron A. Harris..Mt. Harris, Colo.
GM—Byron A. Harris, " "
GS—Byron A. Harris, " "
MS—James Lowry, " "
PA—H. D. Cunningham...Denver, Colo.
CE—F. P. Hall and W. F. Hoglass, Steamboat Springs, Colo.
EM—Rocky Mountain Eng. & Const. Co., Steamboat Springs, Colo.
MM—R. R. Beddow...Mt. Harris, Colo.
EE—R. R. Beddow, " "
SCO—Colorado & Utah Supply Co. Buyer, H. D. Cunningham, Denver, Colo.
S of H—Mules and elec. hoists. Track gauge 36 in.
S of M—2 elec. mach.
PP—3 return tubular boilers, total 250 H. P., 1 gen. unit, 2200 volts A. C., 1 pump.
EMP 250. Last fiscal year output 357,421 tons.

CONSOLIDATED COAL & COKE CO. THE
General Office, Denver, Colo.
Baum Mine, Shaft; Lignite Seam; 6 to 9½ ft. thick.
PO—Dacono, Colo. SP—Same. CTY—Weld. RR—Union Pacific.
PR—C. L. Baum, ... Denver, Colo.
TR—C. L. Baum, " "
GM—C. L. Baum, " "
PA—C. L. Baum, " "
GS—C. W. Smith, ... Dacono, "
EM—C. W. Smith, " "
MS—Stanley Blose.......Dacome, Colo.
MM—John Jennehomme, " "
S of H—Mules and 1 Elec. loco. Track gauge 3 ft.
S of M—9 Elec. mach.
PP—4 Brownell return tubular boilers, total 500 H.P., 1 Westinghouse Generator, 100 K. W., 250 volts, D.C., 12 pumps, power also purchased.
EMP—175. Sales agent, C. L. Baum, Denver Colo.

CONVERSE, FRANK
Drift Mine, Seam 12 in. thick.
PO—Paonia, Colo.; CTY—Delta; RR—D. & R. G.
GM—Frank Converse......Paonia, Colo.
S of H Mules; track gauge 30 in.
S of M—Hand.
EMP—3. Last fiscal year output 871 tons.

CORYELL, P. C.
General Office, New Castle, Colo.
Lessee of Colorado Fuel & Iron Co.
Placita Mine; Drift; Mid Mesa Verde Seam; 42 to 60 in. thick.
PO—Redstone; Colo; SP—Placita; CTY—Pitkin; RR—Crystal River.
MS—C. Meerdink, Redstone, Colo.
S of H—Mules.
S of M—Hand.
EMP—10.

CRESTED BUTTE ANTHRACITE MNG. CO.
General Office, Equitable Bldg., Denver, Colo.
Smith Anthracite Mine; Slopes; Seam 54 in. thick.
PO—Crested Butte, Colo.; SP—Same; CTY—Gunnison; RR—D. & R. G.
PR—Frank Bulkley.......Denver, Colo.
TR—Jos. Giedlartz, " "
PA—Jos. Giedlartz, " "
MS—O. V. Roberts, Crested Butte, Colo.
EM—J. R. Robinson....Gunnison, Colo.
S of H—Mules, rope and gravity.
S of M—Hand.
PP—2 Water tube boilers, total 200 H. P., 3 pumps.
Expect to produce 50,000 tons this year.

CRESTED BUTTE COAL CO. (THE).
General Office, Equitable Bldg., Denver, Colo.
Bulkley Mine; Slope; Lower Seam, 60 to 96 in. thick.
PO—Crested Butte, Colo.; SP—Same; CTY—Gunnison; RR—D. & R. G.
PR—Frank Bulkley......Denver, Colo.
TR—Jos. Giedlartz, " "
PA—Jos. Giedlartz, " "
EM—J. H. Robinson.....Gunnison, Colo.
MS—Fred Gulliford..Crested Butte, Colo.
S of H—Mules, rope and gravity.
S of M—Hand.

CURTIS COAL CO (THE).
General Office, Colorado Springs, Colo.

(Continued on Next Page.)

Curtis Coal Co., The—Cont.
Curtis Routt Mine; Slope; Seam 60 in. thick.
PO—Pool, Colo.; SP—Miluer, Colo.; CTY—Routt; RR—D. & St. L.
PR—W. W. Curtis, Colorado Springs, Colo.
TR—W. W. Curtis, " " "
GM—W. W. Curtis, " " "
PA—W. W. Curtis, " " "
GS—R. Wooden............Pool, Colo.
S of H—Rope.
S of M—Hand.
PP—1 return tubular boiler.

DeBOUTER, SAMPSON & PITCHFORD.
Peerless Mine; Shaft; 59 to 62 in. thick.
PO—Frederick, Colo.; SP—Fort Lupton; CTY—Weld; RR—V. P., D. L. & N. W.
PR—Henry Sanson.....Frederick, Colo.
TR—E. DeBoutter, " "
MS—E. DeBouter......Frederick, Colo.
PA—Budd Pitchford, " "
MM—Budd Pitchford, " "
EM—Thos. Knill, " "
S of H—Mules; track gauge, 30 in.
S of M—Hand and 1 comp. air mach.
PP—1 return tubular boiler, 100 H. P., 1 air comp., and 1 pump.
Output 2,000 tons.

DONNELLY COAL CO.
Florence, Colo. No report.

DUGGER COAL CO.
PO—Delta, Colo.; CTY—Delta.
Idle at present.

EL PASO COUNTY LAND & FUEL CO. THE
El Paso Mine, Slope; Seam 6½ to 10 ft. thick.
PO—Colorado Springs, Colo. Box 557 SP—Same. CTY—El Paso. RR—C.R.I.
PR—E. J. Ullrich, Colorado Springs, Colo.
TR—E. J. Ullrich, " "
GM—E. J. Ullrich, " "
MS—Fred W. Price, " " "
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—2 Kewanee tubular boilers, 200 H. P. 1 generating unit, 220 volts, A.C., 3 phase and 250 volts, D. C. Purchase power.
EMP—80. Last fiscal year output 65,671 tons.

ELECTRIC COAL CO.
Electric Mine.
PO—Boulder, Colo.; CTY—Boulder.
No report.

EMPIRE COAL MINING COMPANY, THE
General Office, 305 Cooper Bldg., Denver, Colo.
Empire Mine, Slope; Peerless Seam, 5 to 7½ ft. thick.
PO—Aguilar Colo. SP—Same. CTY—Las Animas. RR—Colorado & Southern.
PR—J. W. Siple..........Denver, Colo.
GM—J. W. Siple, " "
TR—R. D. Marthens, " "
PA—R. D. Marthens, " "
MS—Wm. Waddell....Aguilar, Colo.
EM—L. R. Douglass....Aguilar, Colo.
MM—L. R. Douglass, " "
S of H—Rope. Track gauge 36 in.
S of M—Hand.
EMP—4 Return tubular boilers, total 360 H.P., 4 pumps.

EVANS FUEL CO.
General Office, 2135 15th Street Denver, Colo.
Evans Mine; Shaft; Lignite Seam, 84 to 96 in. thick.
PO—Frederick, Colo.; SP—Same; CTY—Weld; RR—U. P.
PR—G. Zarlengo..........Denver Colo.
TR—Felix Frazzini, " "
GM—Chas. Zarlengo, " "
PA—P. Frazzini.
MS—L. B. Domenico, Frederick, Colo.
MM—John Domenico, " "
EE—Taze Jones, " "
EM—Thos. Knill......Lafayette, Colo.
S of H—Mules; track gauge 30 in.
S of M—4 Comp. air mach.
PP—3 Return tubular boilers, total 240 H. ,P. 2 compressors, 1 pump; Power purchased.
EMP100. Last fiscal year output, 50,000 tons. Sales Agent, G. Zarlengo, Denver, Colo. Successors to the Evans Coal Land Co.

FARMERS PROGRESSIVE COAL CO.
Black Diamond Mine; Drift; Semi-Bituminous Seam; 96 in. thick.
PO -Paonia, Colo.; SP—Same; CTY—Delta; RR—D. & R. G.
PR—Mrs. Chas. Cowan, Sr.
TR—Mrs. Chas. Cowan, Sr.
GM—William Price
MS—William Price
S of H—Mules and gravity.
S of M—Hand.
EMP—4. Last fiscal year output, 1121 tons.

FEDERAL COAL MINING COMPANY
General Office, 206 Tramway Bldg., Denver, Colo.
Federal Mine; Slope; No. 1 Lower Series Seam; 60 to 96 in. thick.
PO—Oak Creek, Colo.; SP—Routt, Colo.; CTY—Routt; RR—D. & S. L.
PR—M. E. Serat........Denver, Colo.
TR—M. E. Serat " "
PA—M. E. Serat " "
SM—M. E. Serat, " "
GS—Jos. Matthews.....Oak Creek, Colo.
GM—Jos. Matthews, " "
S of H—Rope.
S of M—Hand, 1 elec. and 6 comp. air mach.
PP—2 return tubular boilers, total 300 H. P., 4 engines, 2 pumps, 2 air compressors.
EMP -75. Last fiscal year output, 40,000 tons.
Note—Opening a new shaft mine.

FIDEL COAL COMPANY.
Fidel Mine; Slope; Semi-Bituminous Seam; 66 in. thick.
PO—Fruita, Colo; SP—Same; CTY—Mesa;
PR—Anthony Fidel,......Fruita, Colo.
GM—Anthony Fidel, " "
PA—Anthony Fidel, " "
MS—Anthony Fidel, " "
SM—Anthony Fidel, " "
S of H—Gravity. Track gauge 24 in.
S of M—Hand.
EMP—2. Last fiscal year output 1600 tons.

FREDERICK FUEL CO.
General Office, Foster Bldg., Denver, Colo.
Frederick Mine, Slope 7 ft. 4 in. thick.
PO—Frederick, Colo. SP—Same. CTY Wald. RR—Union Pacific.
PR—J. V. Sickman....... Denver, Colo.
GM—J. V. Sickman, " "
TR—J. P. Brackett, " "
MS—Ernest Whilts.....Frederick, Colo.
SM—J. Bonato, " "
EM—R. W. Shumway, " "
S of H—Mules and rope. Track gauge 36 in.
S of M—10 Comp. air mach.
PP—3 Return tubular boilers, 2 compressed air machines, 2 pumps. Also purchase power.
EMP—90. Last fiscal year output 70,000 tons.

GARFIELD COAL MINING CO., THE
General Office, Grand Junction Colo.
Garfield Mine, Slope; Seam 7½ to 8 ft. thick.
PO—Palisade, Colo. SP—Same. CTY—Mesa. RR—D.&R.G., and Colo. Mid.
PR—Albert E. Baylis..Grand Jct., Colo.
GM—Albert E. Baylis, " "
MS—George Smith, " " "
S of H—Gravity.
EMP—6. Last fiscal year output, 8,500 tons. Sales Agent, Albert E. Baylis.

GARFIELD MINE LEASING COMPANY.
Garfield Mine; Drift; Allen Seam: 72 to 168 in. thick.
PO—New Castle; Colo; SP—Same; CTY—Garfield; RR—Colo. Midland.
PA—J. P. Brackett, Foster Bldg., Denver, Colorado.
TR—I. A. Moore, Foster Bldg., Denver Colo.
GM—D. W. Brown, Foster Bldg., Denver Colo.
GS—G. T. Peart, Foster Bldg., Denver Colo.
PA—G. A. Easterly, Foster Bldg., Denver Colo.
MS—Thos. Gibby, New Castle, Colo.
S of H—1 elec. Loco. & Mules.
S of M—Hand.
PP—3 return Tubular Boilers: 1 Air compressor.
EMP—50. Last fiscal year output, 49,693 tons.

GIBSON LUMBER & FUEL COMPANY.
General Office, Canon City, Colo.
Royal George Mine; Slope; Radiant, Royal George No. 4 Seam; 72 to 96 in thick.
PO—(Box 75) Canon City, Colo; SP—Same; CTY—Fremont; RR—A. T. & S. F.
PR—D. E. Gibson, ..Canon City, Colo
GM—H. Loche, " "
PA—H. Loche, " "
GS—E. W. Jones, " "
MS—E. W. Jones " "
CE—Chas. Mitten, " "
SCO—Gibson Lumber & Fuel Co., Buyer, R. A. Bell, Box 75, Canon City, Colorado.
S of H—Mules and elec. hoist.
S of M—Hand.
PP—2 elec. engines, total 200 H. P., 2 pumps. Purchase power.
EMP 80. Last fiscal year output, 90,000 tons
Note—Formerly Royal George Coal Producing Co.

GILSON ASPHALTUM CO.
General Office, Philadelphia Pa.
Two mines in Colorado; 1 mine in Utah.
PR—Arthur Sewall, ..Philadelphia, Pa.
TR—Ira Atkinson, " "
GM—M. W. Cooley, .. Mack, Colo.
PA—Homer D. Ford, .. Watson, Utah.
GS—Homer D. Ford......Watson, Utah
EM—Homer D. Ford, " "
SM—Homer D. Ford, " "

Carbonera Mine; Drift; 66 to 96 in. thick.
PO—Mack, Colo.; SP—Carbonera; CTY—Mesa; RR—Unita.
S of H—Mules. Track gauge 40 in.
EMP—8. Last fiscal year output 9,660 tons.

GORDON COAL COMPANY
Gordon Mine; Slope; Gordon & Maitland Seam; 46 to 48 in. thick.
PO—Gordon, Colo.; SP—Walsenburg, Colo.; CTY—Huerfano; RR—D. & R. G.
PR—James B. Dick,...Walsenburg, Colo.
GM—James B. Dick, " "
PA—James B. Dick, " "
TR—J. J. Pritchard, " "
GS—R. T. Bell, " "
CE—S. M. Thompson, " "
SM—John Kirkpatrick, " "
SCO—Huerfano Trading Co. " "
S of H—Elec. and steam locos. Track gauge 36 in.
PP—2 water tube boilers, total 120 H. P., 1 gen. unit, 440 volts D. C., 1 pump. Purchase power.
EMP—40. Last fiscal year output 25,000 tons.

GRAND JUNCTION MNG. & FUEL CO. THE
Genral Offic, Equitable Bldg., Denver, Colo.
Cameo Mine, Drift, Lower Mesa Verda Seam 6 to 9 ft. thick.
PO—Cameo, Colo. SP—Same. CTY—Mesa. RR—Colo. Mid. & D.R.G.
PR—John McNeil, Jr., MacGregor, Colo.
TR—A. M. McNeil,.......Denver, Colo.
GM—C. S. Phister, " "
GS—Geo. W. McNeil......Cameo, Colo.
PA—Geo. W. McNeil, " "
MS—John Calderhead, " "
MM—D. P. McNeil, " "
EE—C. S. Batenfield, " "
SCO—The Cameo Merc. Co. Buyer, Frank Wachob, Cameo, Colo.
S of H—3 elec. locos. Track gauge, 36 in.
S of M—5 elec. mach.
PP—4 Water tube boilers, total 1000 H.P., 3 Gen. units, 250 volts, D.C.
EMP—85. Last fiscal year output 65,000 tons. Sales Agent, Chas. S. Phister, Denver, Colo.

GRAND VIEW COAL CO.
Grand View Mine, Drift; Seam 4 to 5 ft. thick.
PO—Palisade Colo.; SP—Same. CTY Mesa. RR—D. & R. G. and C. & M.
MS—T. E. Llewellyn....Palisade, Colo.
S of H—Gravity. Track gauge 3 in.
S of M—Hand.
EMP—2 to 6. Last fiscal year output 2,822 tons.

GRAND MESA FUEL CO.
Fairview Mine; Drift; Seam, 78 in. thick.
PO—Delta, Colo.; SP—Same; CTY—Delta; RR—D. & R. G., Fairview Fairview & International Br.
PR—Watson Ziegler........Delta, Colo.
GM—Watson Ziegler, " "
PA—Watson Ziegler, " "
TR—C. G. Mantz, " "
CE—George Enos, " "
MS—C. S. Galliday, " "
S of H—Mules; track gauge, 36 in.
S of M—Hand.
Sales Agent, Watson Ziegler, Delta, Colo.

GREAT MATCHLESS FUEL CO.
General Office, 830—18th st.
PR—T. M. Patterson......Denver, Colo.
GM—S. A. Snyder, " "
TR—R. C. Campbell, .. Denver, "
CE—R. A. Pierce........Denver, Colo.
Sales agent, S. A. Snyder, Denver, "

Matchless Mine, Shaft, Lignite Seam, 4½ to 6 ft. thick.
PO—Louisville, Colo. SP—Same. CTY—Boulder. RR—C.&S.
MS—R. S. Husband....Louisville, Colo.
S of H—1 comp. air loco. and mules. Track gauge 30 in.
S of M—5 comp. air mach.
PP—1 Compressor and 1 pump. Power purchased.
EMP—85. Last fiscal year output 32,050.75 tons.

Fox Mine, Shaft, Lignite Seam, 8 to 9 ft. thick.
PO—Gorham, Colo. SP—Marshall, Colo. CTY—Boulder. RR—C.&S.
MS—John Shultz, .. Gorham, Colo.
S of H—Mules and 1 comp. air loco. Track gauge 30 in.
S of M—Hand and 1 comp. air mach.
PP—1 Compressor and 2 pumps. Power purchased.
EMP—60. Last fiscal year output 47,370.55 tons.

HAYDEN BROS COAL CORP. (THE)
General Office, 402 Tramway Bldg., Denver, Colo.
Hayden Mines, Slope; Seam 84 in. thick.
PO—Oak Creek, Colo.; SP—Kramer, Colo. CTY—Routt; RR—D. & S. L.
PR—Lewis A. Hayden.....Denver, Colo.
GM—Lewis A. Hayden, " "
TR—Wm. F. Hayden, " "
PA—E. V. Hutchins " "
CE—L M. Chambers, " "
MS—C. P. O'Neil......Oak Creek, Colo.
S of H—Elec. nad 1 Steam loco.; track gauge 36 in.
S of M—Hand.
PP—2 Heturn tubular boilers, total 300 H. P., 2 gen. units, 60 K. W., 240 volts D. C.
EMP—70. Last fiscal year output 30,000 tons.

HOTCHKISS FUEL & SUPPLY CO. (THE).
The Bennett Mine; Drift; Seam, 60 to 84 in. thick.
PO—Hotchkiss, Colo.; SP—Lazear, Colo.; CTY—Delta; RR—D. & R. G., Sommerset Br.
PR—H. R. Bennett....Hotchkiss, Colo.
TR—M. W. Bennett, " "
GM—M. W. Bennett, " "
CE—F. S. Hotchkiss, " "
S of H—Mules.
S of M—Hand.
EMP—3.

HUERFANO COAL CO.
General Office, Denver, Colo.
PR—S. S. Murphey.......Denver, Colo.
GM—S. S. Murphey, " "
TR—N. S. Anderson, " "
Sales Agent E. W. Martindell, " "

Ludlow Mine, Drift, "Hastings" or "Berwind" Seams, 4½ to 7 ft. thick.
PO—Ludlow, Colo. SP—Same. CTY—Las Animas. RR—Colorado & Sou.
MS—F. McDermott......Ludlow, Colo.
S of H—Rope. Track gauge 3 ft.
S of M—Hand and 3 Elec. mach.
PP—2 Erie City water tube boilers, total 300 H. P., 1 gen. unit, 440 volts A. C., 3 phases, 60 cycles. Purchase power.
EMP—120. Last fiscal year output 82,000 tons.

Mutual Mine Shaft, "Walsen" Seam, 8 ft. thick.
PO—Walsenburg, Colo. SP—Same. CTY—Huerfano. RR—Denver and Rio Grande.
MS—R. F. Poli......Walsenburg, Colo.
S of H—Rope and Mules. Track gauge 3 ft.
S of M—3 elec. mach. and hand.
PP—2 Kewanee return tubular boilers, total 300 H. P., 3 pumps. Elec. power purchased.
EMP—60. Last fiscal year output 39,585 tons.

IDEAL COAL CO.
Ideal Mine; Slope; Seam, 96 in. thick.
PO—Erie, Colo.; SP—Same; CTY—Weld; RR—Burlington & W. P.
PR—George M. Wooley......Erie, Colo.
PA—George M. Wooley, " "
CE—George M. Wooley, " "
TR—Phineas D. Wooley, " "
MS—Phineas D. Wooley, " "
S of H—Mules.
S of M—1 Comp. air mach.
PP—2 Water tube boilers, total 140 H. P., 1 compressor, 1 pump.

IDEAL FUEL CO.
Jewel Mine; Slope; Robinson Seam; 30 to 48 in. thick.
PO—Aguilar, Colo.; SP—Lynn, Colo.; CTY—Las Animas; RR—C. & S.
PR—Joseph Cox.........Aguilar, Colo.
TR—Roy C. Cox, 2811 Race St., Denver, Colo.
GM—Roy C. Cox, 2811 Race St., Denver, Colo.
PA—E. L. Pendleton.....Aguilar, Colo.
MS—Harry Smith........Aguilar, Colo.
EM—Mark Danford, " "
MM—Harry Smith, " "
EE—Harry Smith, " "
CE—Mark Danford......Trinidad, Colo.
SCO—Ideal Mercantile Co. Buyer, E. L. Pendleton, Aguilar, Colo.
S of H—Rope and 2 elec. loco. Track gauge 36 in.
S of M—1 Elec. mach. and hand.
PP—Power purchased.
EMP—55. Last fiscal year output 21,742 tons.
Sales Agent, Roy C. Cox, Denver, Colo.

INTERNATIONAL FUEL COMPANY
General Office, Denver, Colo.
Wolf Creek Mine; Drift; 120 to 168 in. thick.
PO—Mt. Harris, Colo.; SP—Same; CTY—Routt; RR—D. & St. L.
PR—Geo. Zarlengo.......Denver, Colo.
MS—S. Domenico.....Mt. Harris, Colo
S of H—Mules.
PP—1 return tubular boiler, total 150 H. P., 1 air compressor.
EMP—40.

JEFFRYES FUEL CO.
Jeffryes Mine; Drift; Starkville Seam; 54 to 72 in. thick.
PO—Trinidad, Colo.; SP—Jeffryes; CTY—Las Animas; RR—C. & S., Interurban.

PR—Eli Jeffryes.......Trinidad, Colo.
TR—A. G. Jeffryes, " "
GS—A. G. Jeffryes, " "
CE—Danford & Douglas, " "
SCO—Jeffryes Bros. Buyer, A. G. Jeffryes, Trinidad, Colo.
S of H—Mules.
S of M—Hand.
PP—Purchase power.
EMP—30. Last fiscal year output 22,000 tons.
Note—Formerly Jeffryes Coal & Mining Co.

JEFFRYES COAL & MINING CO.
See Jeffryes Fuel Co.

JONES & IRWIN COAL CO.
Slope Mine; Pinnacle Seam, 72 in. thick.
PO—Oak Creek, Colo.; SP—Same; CTY—Routt; RR—D. & S. L.
PR—D. W. Jones......Oak Creek, Colo.
S of H—Mules and gravity.
S of M—Hand.

JUANITA COAL & COKE CO.
General Office, Pueblo, Colo.
King Mine, Slope; "King" Seam; 8 to 10 ft. thick.
PO—Bowie, Colo. SP—Same. CTY—Delta. RR—D.&R.C., North Fork Branch.
PR—A. T. King, ... Pueblo, Colo.
TR—A. S. Booth, " "
GM—Alexander Bowie, .. Bowie, "
PA—Alexander Bowie, " "
MM—W. W. Bowie, " "
MS—Wallace D. Bowie " "
S of H—Mules and rope; track gauge 42 in.
S of M—1 Elec. mach. and hand.
PP—7 Return tubular boilers, total 535 H. P., 5 gen. units 500 volts D. C., 2 pumps.
EMP—80. Last fiscal year output 65,000 tons.

JUNIPER COAL COMPANY.
Leased properties to Hayden Bros. Coal Corp.

LAFAYETTE COAL MINING CO.
Pluto Mine; Slope, Sub Bituminous Seam, 60 to 66 in. thick.

PO—Lafayette, Colo.; SP—Same; CTY—Boulder; RR—C. B. & Q.
TR—George W. Jackson..Lafayette, Colo.
GM—O. M. Hopkins, " "
PA—O. M. Hopkins, " "
MS—O. M. Hopkins, " "
EM—T. J. Knill, Jr., " "
MM—Chas. Campbell, " "
EE—Chas. Campbell, " "
S of H—Rope; track gauge 36 in.
S of M—3 Comp. air mach.
PP—3 Return tubular boilers, total 280 H. P., 1 compressor, 3 pumps.
EMP—30.

LA PLANTE & SONS.
New Baldwin Mine; Slope; Seam, 48 t 54 in. thick.
PO—Gunnison, Colo.; SP—New Baldwi Mine, Colo.; CTY—Gunnison; RR—D. & R. G.
PR—D. L. La Plante....Gunnison, Colo.
MS—D. L. La Plante, " "
MM—F. R. La Plante, " "
S of H—Mules and rope.
S of M—1 Comp. air mach.
PP—1 Vertical boiler, 60 H. P., 1 compressor, 1 pump.
EMP—5. Output, 1,500 tons.
Note—Idle during past year.

LARIMORE COAL COMPANY.
Larimore Mine; Slope; Walson & Carmen Seam; 36 to 72 in. thick.
PO—Strong, Colo; SP—Same; CTY—Huerfano; RR—D. & R. G.
PR—Samuel Dunford,.....Strong, Colo.
TR—Thomas Brown " "
MS—Thomas Brown, " "
S of H—Rope and 1 Hart Steam loco.
S of M—2 elec. machs.
PP—2 Water tube boilers, total 100 H. P., gen. units, 450 volts A. C., 3 phase, 60 cycles. Purchase power.
EMP—50. Last fiscal year output, 50,000 tons
Note—Successors to Monument Valley Coal Mining Co.

LEWIS J. T. & SON.
General office, Gorham, Colo.
Lewis Mine; Slope; 96 in. thick.
PO—Gorham, Colo; SP—Marshall; CTY—Boulder; RR—C. & S.
S of H—Mules. Track gauge 30 in.
S of M—Hand.
PP—1 pump.
EMP—5. Last fiscal year output, 2,500 tons.

LEYDEN COAL COMPANY, THE
Leyden Nos. 2 and 3 Mines; Shaft.
PO—Denver, Colo.; SP—Leyden, Colo.; SP—Denver. RR—Denver & Northwestern.
PR—S. M. Perry........Denver, Colo.
GM—S. M. Perry, " "
TR—C. S. Haughwont " "
PA—F. A. Perry, " "
GS—J. G. Perry, " "
S of H—Mules and rope.
S of M—Hand, 5 Elec. and 9 Comp. air mach.
PP—4 Lyons return tubular boilers, 9 return tubular boilers, 3 gen. units, 240 volts, D. C.
EMP—200 to 250.
Sales Agent, F. A. Perry, Denver, Colo.

LITTELL BROS. COAL MNG CO.
General Office, Equitable Bldg., Denver, Colo.
PR—W. F. Littell.........Denver, Colo.
TR—H. L. Littell, " "
GM—H. L. Littell, " "
GS—I. A. Littell, " "
Sales Agent, G. A. Tyler, Pueblo, Colo.

Porter Mine, Slope, Seam 5 to 7 ft. thick.
PO—Crested Butte, Colo.; SP—Same; CTY—Gunnison; RR—Denver & Rio Grande Crested Butte Br.
MS—W. R. Kerr, Crested Butte, Colo.
S of H—Mules, rope and gravity; track gauge 28 in.
S of M—Hand.
PP—3 Boilers total 120 H. P.
EMP—75. Last fiscal year output 40,000 tons.

Horace Mine, Shaft, Anthracite Seam 24 to 42 in. thick.
PO—Crested Butte, Colo.; SP—Same; CTY—Gunnison; RR—Denver & Rio Grande, Crested Butte Br.
MS—Jas. Ralston, Crested Butte, Colo.
S of H—Engine, hoist & mules; track gauge 28 in.
S of M—Hand.
PP—1 Boiler 40 H. P. and 1 boiler 60 H. P., 2 Pumps.
EMP—50. Last fiscal year output 16,000 tons.

LOMA FUEL COMPANY THE
Loma Mine; Slope; Walsen Seam, 68 to 84 in. thick.
PO—Walsen, Colo.; SP—Walsenburg. Colo.; CTY—Huerfano; RR—C. & S., and D. & R. G.
PR—Jos. Ball........Canon City, Colo.
GM—Jos. Ball, " "
TR—G. E. Pleasants, Walsenburg, Colo.
PA—G. E. Pleasants, " "
MS—G. E. Pleasants, " "
CE—D. A. Stout, " "
EM—D. A. Stout, " "
MM—M. F. Brookes, Walsenburg, Colo.
EE—M. F. Brookes, " "
SCO—Colo. Supply Co. " "
S of H—Mules; gravity; track gauge 35 in
S of M—3 elec. mach.
PP—Power purchased.
EMP—10. Last fiscal year output 11,280 tons.
Sales Agent, C. F. & I. Co., Denver, Colo.

LOUISVILLE COAL & LAND CO.
Firestone Mine, Shaft Seam 6½ ft. thick.
PO—Firestone, Colo.; SP—Frederick; CTY—Weld. RR—Union Pacific.
PR—D. Rotolo.......Firestone, Colo.
GM—D. Rotolo, " "
MS—D. Rotolo, " "
TR—R. A. Mauro, " "
PA—R. A. Mauro......Firestone, Colo
S of H—Mules; track gauge 3 ft.
S of M—Hand and 5 comp. air mach.
PP—3 Return tubular boilers, total 260 H. P., 2 Air comp. 2 pumps.
Last fiscal year output 51,767 tons.

McNALLY, MATTHEWS & CO. (Lessee).
Maitland Mine; Slope; Lennox & Sunshine Seams; 36 to 42 in. thick.
PO—Maitland, Colo.; SP—Walsenburg, Colo.; CTY—Huerfano; RR—D. & R. G. and C. S. Operate Washery.
TR—George McNally...Walsenburg, Colo.
GM—Jas. Matthews.....Maitland, Colo.
MS—Jas. Matthews, " "
PA—John McGowan,
V. A. F. Co., Denver, Colo.
CE—F. W. Whiteside,
V. A. F. Co., Denver, Colo.
SCO—Western Stores Co. Buyer, Geo. Baker, Maitland, Colo.
S of H—Rope and mules.
S of M—5 elec. mach.
PP—Power purchased, 1 pump.
EMP—35. Last fiscal year output 15,000 tons.
Formerly the Maitland Mine of the Victor-America Fnuel Co.

McNEIL COAL CO.
General Office, 1120 1st National Bank Bldg., Denver, Colo.
McGregor Mine; Slope; 156 in. thick.
PO—McGregor, Colo.; SP—Same; CTY—Routt; RR—Denver & Salt Lake.
PR—John McNeil, Sr.....Denver, Colo.
TR—G. F. Macbeth, " "
MS—John McNeil, Jr.,
Steamboat Springs, Colo.
MM—D. P. McNeil....McGregor, Colo.
SCO—Cameo Mercantile Co., " "
SM—Geo. McNeil........Cameo, Colo.
S of H—Mules.
S of M—2 elec. chain undercutters.
PP—1 gen. unit, 250 volts D. C., 1 pump.
EMP—70. Last fiscal year output 8,000 tons.

MANCOS FUEL CO.
Mancos Mine; Slope; Peacock Seam; 48 in. thick.
PO—Mancos, Colo.; SP—Same; CTY—Montezuma; RR—D. & R. G., Southern.
PR—W. A. Nicodemus, ..Telluride, Colo.
TR—J. R. Freeman......Mancos, Colo.
GM—J. R. Freeman, " "
PA—J. R. Freeman, " "
S of H—Mules.
S of M—Hand.
EMP—1 to 3. Output 600 tons.

MOFFAT COAL COMPANY, THE
Oak Hills Nos. 1 and 2 Mines, Slope. Pinnacle Seam, 120 in. thick.
PO—Oak Creek, Colo.; SP—Oak Hills, Colo.; CTY—Routt; RR—D. N. W. & P.
PR—S. M. Perry......Denver, Colo.
GM—S. M. Perry, " "
TR—J. H. Porter " "
PA—F. A. Perry " "
GS—R. M. Perry....Oak Creek, Colo.
MM—J. H. Haggarty...Oak Creek, Colo.
MS—John Alexander, " "
EE—A. Higginbottom, " "
SM—Thos. Foster....Phippsburg, Colo.
S of H—3 elec., 2 steam locos., mules and rope; track gauge 36 in.
S of M—5 elec. mach. and hand.
PP—4 boilers, total 1000 H. P., 2 gen. units 2300 volts A. C., 3 phase, 60 cycles, 250 volts D. C., 2 comp., 2 pumps.
EMP—300. Last fiscal year output 260,000 tons.
Sales Agent, F. A. Perry, Denver, Colo.

MONUMENT VALLEY COAL MINING CO.
See Larimore Coal Co.

MUTUAL COAL CO.
See Huerafano Coal Co.

NATIONAL FUEL CO (THE)
General Office, Denver, Colo.
7 Mines; Shafts and Slopes; 64 to 168 in. thick.
PO—Louisville and Aguilar Colo.; SP—Same; CTY—Las Animas, Adams, Boulder and Huerfano; RR—C., B. & Q., U. P., Colo. So., D. & R. G.
PR—H. Van Mater, Denver, Colo.
GM—H. Van Mater, " "
TR—W. S. Stic, " "
PA—Harry Schrieff, " "
GS—Joseph Watson, Louisville, Colo.
EM—Samuel Toscher, Denver, Colo.
SCO—Address the Company, Denver, Colo.
S of H—Mules and Rope.
S of M—14 Elec. Mach.
PP—Power purchased.
EMP—500.
Sales Agent, Thos. T. Egan, Denver, Colo.

NEW MAITLAND COAL CO.
Hickory Canon Mine, Slope, Lenox Seam, 3 to 4 ft. thick.
PO—Walsenburg, Colo.; SP—Picton; CTY—Huerfano; RR—D. & R. G., Loma Br.
PR—Samuel Danford..Walsenburg, Colo.
GM—Samuel Danford, " "
MS—Samuel Danford, " "
CE—Danford & Thompson, " "
EM—Danford & Thompson " "
MM—J. F. Thompson, " "
TR—Wm. Gale, " "
EE—Thos. Gale, " "
SCO—Pinion Supply Co., " "
S of H—Mules; track gauge 3 ft.
S of M—1 Elec. mach.
PP—Volts 440, A. C., 3 phases, 1 pump, purchase power.
EMP—45. Last fiscal year output 7,700 tons.
Sales Agent, Edward Slates, Walsenburg, Colo.

NORTH PARK COAL CO.
General Office, Fort Collins, Colo.
Moore Mine; Shaft; Lignite Seam; 30 to 40 ft. thick.
PO—Coalmont, Colo;. SP—Same; CTY—Jackson; RR—U. P., C. W. & E. branch.
PR—R. W. Fleming, Fort Collins, Colo.
TR—L. C. Moore.......Coalmont, Colo.
GM—J. M. Purdie......Coalmont, Colo.
MS—J. M. Purdie, " "
S of H—Gravity.
S of M—Hand.
PP—1 engine.
EMP—10. Output 2099 tons.
Note—Just commenced hipping coal.

NORTHERN COLORADO COAL CO. (THE)
See Northern Colorado Fuel Co.

NORTHERN COLORADO FUEL CO.
General Office, Laramie, Wyo.
Coalmont Mine, Slope: Mammoth Seam, 30 to 65 ft. thick.
PO—Coalmont, Colo.; SP—Same; CTY—Jackson; RR—Colo., Wyo., & Eastern.
PR—Carl M. Owen.....Coalmont, Colo.
GM—E. S. Simms, " "
PA—E. S. Simms, " "
GS—E. S. Simms, " "
MS—E. S. Simms, " "
SCO—Coalmont Supply Co., Buyer, R. B. Adams, Coalmont, Colo.
S of H—Rope and horses.
S of M—Hand.
PP—2 Nagle return tubular boilers; total, 200 H.P.; 1 pump.
EMP—30.
Last fiscal year output 23,000 tons.
Sales Agent, Fred. C. Ewing, Denver, Colo.

O. K. COAL CO.
O. K. Mine; Drift; Seam, 76 to 81 in. thick.
PO—Durango, Colo.;SP—Same; CTY—La Plata; RR—D. & R. G.
PR—F. E. James......Durango, Colo.
GM—W. W. Bay, " "
MS—W. W. Bay, " "
CE—Burdick & Kroeger, " "
S of H—Mules.
S of H—Hand.
EMP—10. Last fiscal year output 5,880 tons.

OAKDALE COAL CO. (THE)
General Office, Denver, Colo.
PR—Wm. B. Lewis, 40 Wall St., N.Y.
TR—A. S. Pratt,
61 Broadway, New York, N. Y.
GS—John D. Jones.....Oak View, Colo.
PA—John D. Jones, " "
GM—Harry F. Nash.....Denver, Colo.
CE—Danford & Douglas..Trinidad, Colo.
Trinidad, Colo.
SCO—Huerfano Trading Co., Oak View, Colo. Buyer, John Kirkpatrick, Walsenburg, Colo.
Sales Agent, Harry F. Nash, Denver, Colo.

Oakdale Mine; Drift; Oakdale Seam; 6 to 14 ft. thick.
PO—Oakview, Colo.; SP—Tropic, Colo.; CTY—Huerfano; RR—D. & R. G.
MS—Wm. Morgan......Oakview, Colo.
S of H—1 Gasoline and 2 elec. locos., rope and mules; track gauge 35½ ins.
S of M—7 comp. air and 2 elec mach. and hand.

PP—6 return tubular boilers, total 1200 H. P., 1 gen. unit for lighting, 3 compressors, 2 pumps.
EMP—231. Last fiscal year output 215,732 tons.

OJO CANON COAL CO.
Ojo, Colo. No report.

PALISADE COAL & SUPPLY CO., THE
Palisade Mine; Drift; Seam 4 to 5 ft. thick.
PO—Palisade, Colo.; SP—Same; CTY—Mesa. RR—D. & R. G., and C. M.
PR—Henry Denman......Palisade, Colo.
GM—Henry Denman, " "
PA—Henry Denman " "
TR—Fred. Rowley, " "
SM—Fred. Rowley, " "
S.of H—Mules and gravity; track gauge 3 ft.
S of M—Hand.
EMP—15. Last fiscal year output 8,000 tons.

PAONIA COAL CO.
General Office, Paonia, Colo.
Farmers Mine; Drift; 108 to 144 in. thick.
PO—Paonia, Colo.; SP—Same; CTY—Delta; RR—D. & R. G.
PR—L. W. Morgan......Paonia, Colo.
TR—S. C. Henn, " "
PA—S. C. Henn, " "
GS—P. B. Jenkins, " "
MS—P. B. Jenkins, " "
EM—P. B. Jenkins, " "
MM—P. B. Jenkins, " "
CE—A. S. McKee, " "
S of H—Mules.
EMP—4. Last fiscal year output 1,250 tons.

PETERSON, EDISON & COMPANY
Shaft Mine; Lignite Seam; 66 in. thick.
PO—Lafayette, Colo.; SP—Same; CTY—Boulder; RR—B. & M. and C. & S.
PR—S. Edison........Lafayette, Colo.
GM—S. Edison, " "
GS—S. Edison, " "
MS—S. Edison, " "
S of H—Mules.
S of M—1 comp. air machine.
PP—1 pump, 1 air comp., 2 boilers, total 120 H. P.
EMP—6.
Note—Successors to Mile High Coal Co.

PETRY COAL COMPANY.
Willie Mine; Slope; Semi-bituminous Seam; 32 to 40 in. thick.
PO—Florence, Colo; CTY—Fremont;
PR—Samuel Petry,.....Florence, Colo.
GM—Samuel Petry, " "
PA—Samuel Petry, " "
MS—Samuel Petry, " "
CE—J. O. McNatt, " "
EM—J. O. McNatt, " "

(Continued on Next Page.)

Petry Coal Co.—Cont.
S of H—Mules. Track gauge 32 in.
EMP—4. Last fiscal year output, 4200 tons.
Note—Successors to Samuel Petry.

PETRY, SAMUEL (Lessor)
See Petry Coal Co.

PIKE'S PEAK FUEL CO.
General Office, Colorado Springs, Colo.
Pikeview Mine, Shaft.
PO—Pikeview, Colo.; SP—Same; CTY—El Paso; RR—D. & R. G.
PR—A. E. Carlton, Colorado Springs, Colo.
TR—J. R. Young, " "
GM—H. McGarry, Colorado Spgs., Colo.
CE—M. O. Danford.....Trinidad, Colo.
MS—W. K. Anderson....Pikeview, Colo.
PA—W. K. Anderson, " "
MM—J. F. Neff........Pikeview, Colo.
SCO—Miners' & Farmers' T. & M. Co., Pikeview, Colo.
S of H—Elec loco. and mules.
S of M—Elec. mach. and hand.
PP—3 Boilers, total 300 H P., 1 gen. unit 250 volts D. C.
Sales Agent, J. R. Young, Colorado Springs, Colo.

PORTER FUEL COMPANY, THE
General Office, Durango, Colo.
Hesperus Mine, Drift; "Fox Hills Group" Seam; 5 to 6 ft. thick.
PO—Hesperus, Colo.; SP—Same; CTY—La Plata; RR—Rio Grande Southern.
PR—A. L. Mohler......Omaha Neb.
TR—A. H. Doane, (Asst) Cheyenne, Wyo.
GM—Frank A. Manley....Omaha, Neb.
GS—W. I. Gifford....Durango, Colo.
PA—W. I. Gifford. " "
MS—Henry Robertson....Hesperus, Colo.
CE—Geo. B. Pryde.....Cheyenne, Wyo
EM—E. H. Burdick....Durango, Colo.
MM—Geo. W. Caviness..Hesperus, Colo.
EE—Geo. W. Caviness. " "
S of H—Mules, rope and 1 elec loco.; track gauge 36 in.
PP—2 Jeffrey return tubular boilers, total 250 H. P., 2 gen. units, 250 volts, D. C., 1 pump
EMP—51. Last fiscal year output 34,760 tons.
Sales Agent, W. I. Gifford, Durango, Colo.

PRIMROSE COAL CO.
Primrose Mines; Slope, Seams 42 to 90 in. thick.
PO—Rugby, Colo.; SP—Same; CTY—Las Animas; RR—Colorado Southern.
PR—H. B. King.......Pueblo, Colo.
TR—H. B. King, " "
GM—H. B. King, " "
PA—H. B. King " "
MS—Harry Mallot.......Rugby, Colo.
EE—R. C. Grout. " "
CE—R. D. Bishard. " "
SCO—Huerfano Trading Co., Rugby, Colo.
General Office, Pueblo, Colo.
S of H—Mules and 2 Elec. locos.; track gauge 36 in.
S of M—Hand and 2 elec. mach.
PP—3 Return tubular boilers, total 400 H. P., 250 volts, D. C. 3 pumps.
Last fiscal year output 38,063 tons.

PROSPECT COAL COMPANY
General Office, Trinidad, Colo.
Prospect Mine; Drift; Lower Series Seam; 41 to 48 in. thick.
PO—Trinidad, Colo.; SP—Same; CTY—Las Animas; RR—A. T. & S. F., D. & R G., C. & S.
PR—Jos. Smith.........Trinidad, Colo
GM—Jos. Smith, " "
TR—L. F. Jones, " "
GS—L. F. Jones, " "
MS—L. F. Jones, " "
MM—L. F. Jones, " "
EM—Hal Barnes, " "
S of H—Mules and 1 gasoline loco. Track gauge 36 in.
S of M—1 short wall elec. mach.
PP—45 K. W. motor generator set, 250 volts D. C. and 2300 volts A. C., 3 phase, 60 cycle. Purchase power.
EMP—10. Last fiscal year output 5,500 tons.

PUEBLO FUEL & MINING COMPANY
General office, 208 Equitable Bldg., Denver, Colo.
Horace Mine; Shaft; 36 in. thick.
PO—Crested Butte, Colo.; SP—Same; CTY—Gunnison; RR—D. & R. G.
PR—W. F. Littell......Denver, Colo.
TR—H. L. Littell, " "
GM—H. L. Littell, " "
PA—H. L. Littell, " "
GS—I. A. Littell, " "
MS—Jas. Ralston, Crested Butte, Colo.
S of H—Mules.
S of M—Hand.
PP—2 water tube boilers, total 100 H. P., 2 gen. units, 1 pump.
EMP—50. Last fiscal year output 10,600 tons.

P. V. COAL CO.
P. V. Mine.
PO—Grand Junction, Colo.; CTY—Messa.
Note—Small wagon mine.

RAPSON COAL MNG. CO. (THE)
General Office, Colorado Springs, Colo
PR—W. W. Curtis Colo. Springs, Colo.
TR—W. W. Curtis, " "
GM—W. W. Curtis, " "
LS—R. Wooden, " "

Rapson No. 1 Mine, Slope Seam 3 to 4 ft. thick.
PO—Colorado Springs, Colo.; SP—Rapson, CTY—Las Animas; RR—C. & S., D. & R. G.
MS—Irving Mellinger, Rapson, Colo.
S of H—Mules and rope; track gauge 36 in.
S of M—Hand and 2 elec. mach.
PP—2 Return tubular boilers, total. 150 H. P.
Last fiscal year output 67,459 tons.

Rapson No. 2 Mine, Shaft Seam 5 to 8 ft. thick.
PO—Colo. Springs, Colo.; SP—Roswell; CTY—El Paso; RR—C. R. I. & P.
MS—R. Wooden, Colo. Springs, Colo.
S of H—Mules and rope; track gauge 36 in.
S of M—Hand and 2 Elec. mach.
PP—2 Return tubular boilers, total 200 H. P., 220 volts D. C., 2 pumps.
Last fiscal year output 43,888 tons.

RED MOUNT COAL COMPANY.
Red Mt. Mine; Slope; Bit. Seam; 84 to 96 in. thick.
PO—Cedaredge, Colo. SP—Austin, CTY—Delta.
GS—A. W. Hall......Cedaredage, Colo.
SM—A. W. Hall " "
PA—A. W. Hall, " "
MS—Martin Motto, " "
S of H—Steam loco.
S of M—Hand.
PP—2 Return Tubular Boilers total 175 H. P., 1 Gen. Unit. One pump.
EMP—3. Last fiscal year output 1372 tons.

RIVERSIDE COAL & POWER CO.
General Office, Palisade, Colo.
Farmers' Mine; Drift; Palisade Seam, 32 to 36 in. thick.
PO—Palisade, Colo.; SP—Same; CTY—Mesa; RR—D. & G. R., & C. M.
PR—B. C. Oyler........Clifton, Colo.
TR—B. C. Oyler, " "
GM—B. C. Oyler " "
MS—B. C. Oyler, " "
S of H—Mules. Track gauge 34 in.
S of M—Hand.
EMP—2. Last fiscal year output 400 tons.

ROCKY MOUNTAIN FUEL CO., (THE)
General Office, Denver, Colo.
PR—D. W. Brown......Denver, Colo.
GM—D. W. Brown " "
TR—John J. Roche, " "
CS—George T. Peart, " "
PA—G. A. Easterly, " "
EM—R. W. Shumway, " "
MM—Harry Noble....Lafayette, Colo.
EE—John Hawthorne, " "
SCO—Rocky Mountain Store Co., Buyer, E. Horstman, Denver, Colo.
Sales agent, Chas. D. Hood, Denver, Colo.

Kubler and Alpine; Drifts; Baldwin Seam, 5 to 8 ft. thick.
PO—Baldwin, Colo.; SP—Same; CTY—Gunnison; RR—D. & R. G., Baldwin Br.
MS—John Featherstone, Baldwin, Colo.
SM—James Shackleford, " "
S of H—Mules, rope and gravity; track gauge 30 in.
S of M—Hand.
PP—5 Return tubular boilers, 400 H. P., 2 gen. units 500 volts D. C., 2 pumps.
EMP—85. Last fiscal year output 36,706 tons.

Piedmont Mine; Drift and slope; Piedmont Seam, 3 to 6 ft. thick.
PO—Sopris, Colo.; SP—Piedmont Colo.; CTY—Las Animas; RR—C. & W. Sopris Br.
MS—Wm. Morgan.......Sopris, Colo.
SM—L. Lewis. " "
S of H—3 Elec. loco., mules and rope; track gauge 36 in.
S of M—Hand
PP—2 Return tubular boilers, total 200 H. P., 3 pumps; power purchased.
EMP—165. Last fiscal year output 93,634 tons.

Pinon Mine; Shaft; Maitland Seam, 4 5½ ft. thick; operate washery.
PO—Camp Shumway, Colo.; SP—Shumway, Colo.; CTY—Huerfano; RR—D. & R. G.; Loma Br.
MS—Earl Stewart, Camp Shumway, Colo.
SM—Wm. Dick....Walsenburg, Colo.
S of H—2 Elec. loco. and mules.
S of M—2 Elec. mach. and hand.
PP—3 Return tubular boilers, total 325 H. P., 1 gen. unit 250 volts D. C., 2 pumps, power purchased.
EMP—70. Last fiscal year output 1,991 tons.

Mitchell; Shaft; Simpson Seam, 6 to 11 ft. thick.
PO—Lafayette, Colo.; SP—Same; CTY—Boulder; RR—C. B. & Q.
MS—J. J. Thomas...Lafayette, Colo.
SM—J. S. Cory, " "
S of H—1 Elec. loco. and mules; track track gauge 36 in.
S of M—2 Comp. air mach. and band.
PP—3 Return tubular boilers, total 250 H. P., 1 pump also power from Simpson Mine.
EMP—58. Last fiscal year output 56,764 tons.

Standard Mine; Shaft; Standard Seam, 4 to 9 ft. thick.
PO—Lafayette, Colo.; SP—Same; CTY—Boulder; RR—C. B. & Q.
MS—Geo. Swearinger...Lafayette, Colo.
SM—J. S. Cory, " "
S of H—1 Elec. loco. and mules; track gauge 36 in.
S of M—8 Comp. air mach. and hand.
PP—4 Return tubular boilers, total 390 H. P., 1 gen unit 250 volts D. C., 2 comp. and 2 pumps.
Last fiscal year output 89,975 tons.

Midland Mine, Slope; "Sunshine" Seam; 8 ft. thick.
PO—Sunlight, Colo.; SP—Cardiff, Colo.; CTY—Garfield; RR—Colo. Midland.
MS—J. S. Smith......Sunlight, Colo.
SM—Harry Cummins, " "
S of H—Rope and mules, track gauge 36 in.
S of M—Hand.
PP—2 Return tubular boilers, 2 gen. unit, 250 volts D. C., 1 pump.
EMP—53. Last fiscal year output 51,428 tons.

Industrial Mine, Shaft; "Industrial" Seam; 4½ to 7 ft. thick.
PO—Superior, Colo.; SP—Same; CTY—Boulder; RR—Colorado & Southern.
MS—F. J. L. MacCormac, Superior, Col.
SM—W. F. Autrey.....Superior, Colo
S of H—Mules and 2 Elec. loco.; track gauge 36 in.
S of M—7 Elec. mach.
PP—2 Return tubular boilers; 13 pumps.
EMP—95. Last fiscal year output 68,783 tons.

Gorham Mine, Slope; "Gorham" Seam, 6 to 7 ft. thick.
PO—Gorham, Colo.; SP—Marshall, Colo.; CTY—Boulder. RR—Colo. & Southern.
MS—Tom Hilton ......Gorham, Colo.
SM—A. H. Antoine...Marshall. Colo
S of H—Mules and rope; track gauge 36 in.
S of M—Hand and 10 comp. air mach.
PP—1 Air comp.; 1 pump, purchase power.
EMP—90. Last fiscal year output 104, 758 tons.

Vulcan Mine, shaft; "Vulcan" Seam; 6 to 7 ft. thick.
PO—Lafayette, Colo.; SP—Same; CTY Boulder; RR—Colo. & Southern.
MS—Chas. Billington..Lafayette, Colo.
SM—J. S. Cory, " "
S of H—Mules; track gauge 3 ft.
S of M—Hand and 6 air comp.
PP—2 Return tubular boilers total 300 H. P.; 1 air comp.; 1 pump.
EMP—50. Last fiscal year output 50,912 tons.

Rex No. 1 Mine, Shaft; "Rex" Seam. 6 to 7 ft. thick.
PO—Louisville, Colo.; SP—Same; CTY—Boulder; RR—Colo. & Southern.
MS—Saml. Atkins.....Louisville, Colo.
SM—Harry Ball, " "
S of H—Mules; track gauge 36 in.
S of M—Hand and 11 comp. air mach.
PP—2 Return tubular boilers total 150 H. P.; 1 pump; air from No. 2 Mine
EMP—95. Last fiscal year output 84,039 tons.

Hecla Mine, Shaft; "Hecla" Seam; 4 to 4½ ft. thick.
PO—Louisville, Colo.; SP—Same; CTY—Boulder; RR—Colo. & Southern
MS—Ned Hodgson.....Louisville, Colo.
SM—Harry Ball, " "
S of H—Mules; track gauge 30 in.
S of M—Hand and 4 comp. air mach.
PP—3 Return tubular boilers total 215 H. P., 2 air comp.; 1 pump.
EMP—85. Last fiscal year output 37,602 tons.

Simpson Mine, Shaft; "Simpson" Seam. 6 to 11 ft. thick.
PO—Lafayette, Colo.; SP—Same; CTY—Boulder; RR—Colo. & Southern and C. B. & Q.
MS—T. W. Griffith....Lafayette, Colo.
SM—J. S. Cory, " "
S of H—Mules and 2 elec. loco.; track gauge 36 in.
S of M—Hand and 4 elec. and 5 comp. air mach.
PP—5 Return tubular boilers total 750 H. P., 3 gen. units; 250 volts, D. C.; 1 air comp.; 1 pump, also purchase power
EMP—110. Last fiscal year output 137,966 tons.

ROUTT ELECTRIC COAL COMPANY.
Electric Mine; Slope and Shaft, 60 to 120 in. thick.
PO—Junction City, Colo.; SP—Same; CTY—Routt; RR—D. & St. L.
PR—Albert Wright......Denver, Colo.
TR—Frank Bishop, " "
PA—G. H. Miller........Denver, Colo.
MS—C. C. White, Junction City, Colo.
EM—W. I. Hoklas, " "
SCO—Junction City Store. Buyer, C. C. White, Junction City, Colo.
S of H—Mules and rope.
S of M—Hand.
PP—1 return tubular boiler, total 150 H. H., 1 pump.
EMP—75. Last fiscal year output 23,047 tons.
Sales Agent, G. H. Miller, Denver, Colo.

ROYAL FUEL CO.
General Office, Denver, Colo.
Royal Mine, Shaft; Seam 7 ft. 1 in. thick.
PO—Aguilar, Colo.; SP—Same; CTY—Las Animas; RR—Colo. & So.
PR—H. Van Mater.....Denver, Colo.
GM—H. Van Mater.......Denver, Colo.
TR—Wm. Mathews, " "
GS—Samuel Tescher, " "
CE—C. A. Fisher, " "
MS—Chas. Peet..........Aguilar, Colo.
S of H—Mules and rope.

S of M—Hand.
PP—3 Return tubular boilers total 260 H. P., 2 pumps. Purchase power
EMP—100.

ROYAL GEORGE COAL PRODUCING CO.
See Gibson Lumber & Fuel Co.

RUGBY FUEL CO., THE
General Office, 314 McPhee Bldg., Denver, Colo.
Rugby Mine; Slope; Rugby Seam; 43 to 47 in. thick.
PO—Rugby, Colo.; SP—Same; CTY—Las Animas; RR—C. & S., Main Line.
PR—L. C. Gremlee,.....Denver, Colo.
TR—H. V. Kepner " "
GM—G. C. Davis, " "
PA—G. C. Davis, " "
MS—Thos. McLaughlin,....Rugby, Colo.
EM—Danford & Douglas, Trinidad, Colo
SCO—Huerfano Trading Co., Walsenburg, Colo.
S of H—Mules and rope.
S of M—Hand.
PP—2 Kewanee return tubular boilers, total 140 H. P., purchase electric power.
EMP—75. Last fiscal year output 44,220 tons.

RUSSELL, W. E. COAL CO.
General Office, 1523 Walton St., Denver, Colo.
Russell Mine; Shaft; 66 to 89 in. thick.
PO—Firestone, Colo.; SP—Frederick, CTY—Weld; RR—Union Pacific.
PR—W. E Russell........Denver, Colo.
GM—W. E. Russell, " "
GS—William Sharp.....Firestone, Colo.
EM—Thomas Knill.....Lafayette, Colo.
SCO—Russell Store. Buyer, C. P. Brockway, Denver, Colo.
S of H—Mules. Track gauge 36 in.
S of M—5 comp. air mach.
PP—3 return tubular boilers, total 450 H. P., two air comp., 1 pump.
EMP—65. Last fiscal year output 43,566 tons.

SANTA FE COAL CO.
General Office, Denver, Colo.
Santa Fe Mine; Slope; "No. 4" Seam, 5¼ to 6½ ft. thick.
PO—Trinidad, Colo.; SP—Same and Starksville, Colo.; CTY—Las Animas; RR—A. T. & S. F.
PR—S. S. Murphy.......Denver, Colo.
PA—S. S. Murphy, " "
GM—S. S. Murphy, " "
TR—N. C. Anderson....Trinidad, Colo.
S of H—Mules, rope and gravity; track gauge 3 ft.
S of M—Hand.
PP—Gen. units, 440 volts, A. C., 3 phase, 60 cycles. Purchase power.
EMP—3. Idle at present.
Sales Agent, Huerfano Coal Co.

SHAMROCK COAL CO.
Shamrock Mine; Shaft; Puritan Seam, 9 to 11 ft. thick.
PO—Erie, Colo.; SP—Same; CTY—Weld; RR—Burlington.
PR—P. H. Powers.......Erie, Colo.
PA—P. H. Powers, " "
TR—James Brannan, " "
EM—Thos. P. Morgan, " "
MS—Thos. P. Morgan, " "
S of H—Mules; track gauge 30 in.
S of M—Hand.
PP—2 Return tubular boilers, total 160 H. P., 1 compressor, 2 pumps.
EMP—8. Last fiscal year output, 10,623 tons.

SOUTH CANON COAL CO.
General Office, Denver, Colo.
Sunshine Canon Mine.
This company not operating 5-4-16.

SPENCER, GEO. S.
Mancos Mine; Drift; Seam 30 to 40 in. thick
PO—Mancos, Colo.; **CTY**—Montezuma; RR R. G. S.
GM—Geo. S. Spencer....Mancos, Colo.
S of H—Mules.
S of M—Hand.
Last fiscal year output, 1,000 tons.

STATE COAL COMPANY.
Out of business.

STATES COAL CO.
States Mine; Slope; Seam, 122 to 168 in. thick.
PO—Cedaredge, Colo.; **SP**—Delta, Colo.; CTY—Delta.
GS—C. G. States......Cedaredge, Colo.
S of H—Horses.
S of M—Hand.
EMP—2 to 10.
Last fiscal year output, 3,166 tons.

STRATHMORE FUEL CO.
PO Lafayette, Colo.
PR J. P. Miller.......Lafayette, Colo.
SECY—Geo. W. Jackson, " "

STOKES, W. D.
Stokes Mine; Slope; Seam 48 in. thick.
PO Palisade, Colo.; **SP**—Palisade and Oak Spur; **CTY**—Mesa; **RR**—D. & R. G., & C. M.
GM—W. D. Stokes......Palisade, Colo.
MS—W. D. Stokes, " "
PA—W. D. Stokes, " "
S of H—Mules.
S of M—Hand.
PP 1 pump.
EMP 6. Last fiscal year output 2,000 tons.

SUNNYSIDE COAL MNG. CO., THE
General Office, 1062 Gas & E. Bldg., Denver, Colo.
Sunnyside Mine, Slope; "Walsen" Seam; 6½ to 9½ ft. thick.
PO—Strong, Colo.; **SP**—Same; **CTY**—Huerfano; **RR**—D. & R. G.
PR—W. F. Oakes......Denver, Colo.
CM—W. F. Oakes, " "
GS—H. M. Graves........Strong, Colo.
TR—Ellen Ferry Strong, " "
PA—W. F. Oakes........Denver, Colo.
CE—Danford & Thompson....Walsenburg.
SCO—Sunnyside Store,
S of H—Mules, rope, gravity and 3 elec. locos.
S of M—4 elec. mach.
PP—4 Water tube boilers, total 500 H. P., 2 gen. units, 175 K. W., 250 volts, D. C.; 3 pumps.
EMP—100. Last fiscal year output 90,000 tons. Sales agent, W. F. Oakes, Denver, Colo.

SUNSHINE COAL CO.
Durango, Colo. No report.

SURFACE CREEK CO-OP. COAL CO.
Out of business.

TEMPLE FUEL CO. (THE).
Broadhead No. 2 Mine; Slope; Upper Series Seam, 48 to 54 in. thick.
PO—Broadhead. Colo.; **SP**—Aguilar, Colo.; **CTY**—Las Animas; **RR**—C. & S.
PR—F. R. Wood.......Trinidad, Colo.
TR—J. H. Roberts, " "
GM—F. R. Wood, " "
PA—F. R. Wood, " "
GS—O. C. Cook, " "
MS—O. C. Cook " "
CE—Louis Douglas, " "
EM—Louis Douglas, " "
MM—W. H. Reaume..Broadhead, Colo.
EE—W. H. Reaume, " "
SCO—The Temple Supply Co. Buyer, J. M. Marasky, Broadhead, Colo.
S of H—1 Elec. mach.; track gauge, 36 in.
S of M—3 elec. mach.
PP 1 return tubular boiler, total 60 H. P., 6 gen. units, 440 volts A. C., 3 phase, 60 cycles, 2 pumps. Purchase power.
EMP—125. Last fiscal year output 150,000 tons.

THOMAS COAL COMPANY
General Office, Colorado Springs, Colo.
Thomas Mine; Slope; Lignite & Larimie Band Rock Seam; 72 tó 120 in. thick.
PO—Colorado Springs, Colo.; **SP**—Same; CTY—El Paso; RR—A. T. & S. F.
PR—T. E. Thomas, Colorado Springs, Colo.
GM T. E. Thomas, " "
MS H. M. Thomas, " "
EM Wm Garsten, " "
S of H Mules. Track gauge 21 in.
S of M Hand.
PP—1 return tubular boiler, 40 H. P., 1 pump.
EMP—15. Last fiscal year output, 6000 tons. Sales Mgr., T. E. Thomas, Colorado Springs, Colo.

TIOGA COAL COMPANY
General Office, 710 Gas and Electric Bldg., Denver, Colo.
Tioga Mine; Slope; Robinson Seam; 60 to 84 in. thick.
PO—Tioga, Colo.; **SP**—Same; **CTY**—Huerfano; **RR**—D. & R. G.
PR—John Connell.......Denver, Colo.
PA—W. W. Colvin, " "
TR—W. E. Keeler........Tioga, Colo.
GS—W. E. Keeler, " "
MS—John McQuade, " "
EM—Danford & Thompson, Walsenburg, Colo.
S of H—Mules and rope.
S of M—9 comp. air mach.
PP—7 water tube boilers, 4 pumps, 2 air comp.
Last fiscal year output 50,628 tons.
Note—Successors to Minnequa Coal Co.

TODD, G. S.
General office, Cortez, Colo.
Todd Mine; Slope; Mesa Verde Seam; 36 to 46 in. thick.
PO—Cortez, Colo; CTY—Montezuma;
GM—G. S. Todd, Cortez, Colo.
EMP—3. Last fiscal year output, 526 tons.

TRINIDAD COAL COMPANY.
Keystone Mine; Drift; Trinidad Seam; 42 to 56 in. thick.
PO—Trinidad, Colo. SP—Same; CTY—Las Animas; RR—A. T. & S. F. D. & R. G. Colo. & So
PR—Geo. W. Haigh, ..Trinidad, Colo.
SM—M. E. D. Topham, " "
S of H—Mules. Gauge of track 36 in.
S of M—Hand.
EMP—5. Last fiscal year output 1,200 tons.

TUDOR COAL COMPANY
Danville Mine; A Seam, 96 to 264 in. thick.
PO—Colorado Springs, Colo.; **SP**—Pike View CTY—El Paso RR—Santa Fe.
GM—W. D. Tudor, Colorado Springs, Colo.
PA—W. D. Tudor " "
MS—J. Tudor, Jr. " "
S of H—Rope and Mules.
PP—1 water tube boiler, 75 H. P., 1 gen. unit, A. C.
EMP—13. Last fiscal year output 12,105 tons.
Sales Agent, W. D. Tudor, Colorado Springs, Colo.

TURNER COAL COMPANY
Del Carbon Mine; Slope; Walsen Seam; 84 in. thick.
PO—Del Carbon, Colo.; **SP**—Same; **CTY**—Huerfano; **RR**—D. & R. G., Lama branch.
PR—James B. Dick...Walsenburg, Colo.
TR—R. L. Snodgras, " "
GM—W. C. Ferguson, " "
PA—W. C. Ferguson, " "
MS—Leo McCormick, " "
CE—S. M. Thompson, " "
EE—W. E. Summers, " "
SM—John Kirkpatrick, " "
SCO—Huerfano Trading Co.
S of H—elec. locos. Track gauge 36 in.
S of M—2 Sullivan elec. mach.
PP—Purchase power.
EMP—30. Last fiscal year output 25,000 tons.

UNION COAL & COKE CO.
General Office, Denver, Colo.
Pryor and Klondyke Mines; Slope; Walsen and Cameron Seams, 3 to 7½ ft. thick.
PO—Pryor, Colo.; **SP**—Same; **CTY**—Huerfano; **RR**—D. & R. G., Rouse Branch.
PR—J. V. Bowen.......Denver, Colo
TR—J. V. Bowen, " "
GM—J. V. Bowen, " "
PA—H. Hurlbut, " "
GS—Chas. Peuchat, Sr.....Pryor, Colo.
EE—Chas. Beuchat, Jr., " "
SCO—Huerfano Trading Co., Buyer, John Kirkpatrick, Walsenburg, Colo.
S of H—1 Steam loco. and rope; track gauge 36 in.
S of M—4 Elec. mach. and hand.
PP—2 Return tubular boilers, total 300 H. P., gen. units, 2300 A. C., 3 phase, 60 cycles, 250 volts, D. C., 1-115 H. P., gen. set; 1 pump; power purchased.
EMP—80. Last fiscal year output 51,000 tons.
Sales Agent, H. Hurlburt, Denver, Colo.

UTAH FUEL CO.
General Office, Salt Lake City, Utah.
1 Mines in Colorado, 5 mines in Utah.
Somerset Mine; Slope; 11 ft. thick.
PO—Somerset, Colo.; **SP**—Same; **CTY**—Gunnison; RR—D. & R. G.
PR—E. T. Jeffery......New York, N. Y.
TR-Asst—E. A. Greenwood, Salt Lake City, Utah
GM—A. H. Cowie..Salt Lake City, Utah.
PA—H. N. How, " " " "
EM—A. C. Watts, " " " "
GS—W. C. Ferguson......Denver, Colo.
MS—Robert Williams....Somerset, Colo.
SCO—Wasatch Store Co., Buyer J. B. Schinness, Salt Lake City, Utah.
SM—George McDermaid, Somerset, Colo.
S of H—Mules and rope; track gauge 40 in.
S of M—1 Elec. mach.
PP—6 Return tubular boilers, total 750 H. P., gen. units 500 volts D. C., 1 pump.
EMP—227. Last fiscal year output 293,741 tons.

VESTA COAL MINING CO.
Vesta Mine; Slope and Shaft; 54 to 66 in. thick.
PO—Maitland, Colo.; **SP**—Carbonado or Vesta; CTY—Huerfano; RR D. & R. G. & C. & S., Loma branch.
PR—E. F. McGowan.....Denver, Colo.
PA—E. F. McGowan, " "
TR—L. H. McGowan..Walsenburg, Colo.
GM—L. H. McGowan, " "
MS—P. Turner, " "
SCO—Minnequa Stores Co. Buyer, J. W Bann, Tioga, Colo.
S of H—Elec. locos.
PP—440 volts A. C., 3 phase, 60 cycles.
Expect to commence shipping 350 to 400 tons daily, October 1st, 1916.
Note—Successors to Carbonado Coal Mining Co.

VICTOR-AMERICAN FUEL CO.
General Office, Denver, Colo.
8 Mines in Colorado, 4 mines in New Mexico.
TR—G. F. Barlett.......Denver, Colo.
GM—W. J. Murray, " "
PA—John McGowan, " "
EM—Chief, F. W. Whiteside, " "
MM—N. J. Chapin, " "
CS—D. J. Griffiths....Trinidad, Colo.
SCO—Western Stores Co., Buyer, W. H. Howell, Denver, Colo.
Sales Agent, W. H. Huff..Denver, Colo.

Gray Creek Mine; Slope; Seam 28-54 in. thick.
PO—Gray Creek, Colo; **SP**—Beshoar Jc., Colo.; **CTY**—Las Animas; **RR**—C. & S.
MS—Thos. Jolly....Gray Creek, Colo.
SM—L. Baker, " "
S of H—2 Elec. loco, mules, rope and gravity; track gauge 36 in.
S of M—1 Elec. mach and hand.
PP—Power purchased.

Hastings Mine; Slope; Seam, 4 to 9 ft. thick; operate washery.
PO—Hastings, Colo.; **SP**—Same; **CTY**—Las Animas; **RR**— C. & S. E.
MS—James Cameron...Hastings, Colo.
SM—E. C. Stream, " "
S of H—Elec. loco., mules and rope track gauge 36 in.
S of M—Elec. mach. and hand.
PP—1 Pump; power purchased.

Chandler Mine; Shaft; Seam 58 to 64 in. thick.
PO—Chandler, Colo.; **SP**—Same; **CTY**—Fremont; **RR**—D. & R. G.
MS—M. E. Somerville....Chandler, Colo.
SM—A. G. Price, " "
S of H—Elec. loco., mules and rope, track gauge 36 in.
S of M—Elec. mach. and hand.
PP—1 comp., power purchased.

Radiant Mine; Slope; Seam, 45 to 46 in. thick.
PO—Radiant, Colo.; **SP**—Rockvale, Colo.; **CTY**—Fremont; **RR**—A. T. & S. F.
MS—James Struthers,..Radiant, Colo.
SM—W. C. Smart, " "
S of H—Mules and rope; track gauge 36 in.
S of M—Elec. mach. and hand.
PP—Power purchased.

Ravenwood Mine; Slope; Seam, 30 to 36 in. thick.
PO—Ravenwood, Colo.; **SP**—Winchell; **CTY**—Huerfano; **RR**—C. & S.
MS—John Neish.....Ravenwood, Colo.
SM—A. B. Bishop, " "
S of H—Mules and rope; track gauge 36 in.
S of M—Hand.
PP—Power purchased.

Delagua Mine; Slope and Drift; Seam, 60 to 78 in. thick.
PO—Delagua, Colo.; **SP**—Hastings, Colo.; **CTY**—Las Animas; **RR**—C. & S. E.
MS—B. W. Snodgrass..Delague, Colo.
SM—R. G. Holt, " "
S of H—Elec. loco., mules and rope; track gauge 36 in.
S of M—Elec. mach. and hand.
PP—Power purchased.

Bowen Mine; Drift; Seam, 54 to 68 in. thick.
PO—Bowen, Colo.; **SP**— Same; **CTY**—Las Animas; RR—C. & S.
MS—D. E. Davis.........Bowen, Colo.
SM—D. T. Givens, " "
S of H—Elec. loco., mules and gravity; track gauge 36 in.
S of M—Hand.
PP—Power purchased.

Pinnacle Mine; Slope; Pinnacle Seam.
PO Oak Creek, Colo.; SP—Same; CTY—Routt; RR—D. & S. L.
MS—Wm. Burt......Oak Creek, Colo.
S of H—Mules, rope and gravity.
S of M—3 Elec. mach. and hand.

WALSENBURG COAL MNG CO.
Rockland Mine; Shaft; Walsen Seam, 72 in. thick. Operate Washery.
PO—Rockland, Colo.; **SP**—Same; **CTY**—Huerfano; **RR**—Denver & Rio Grande.
PR—George Fruith..Walsenburg, Colo.
CM—George Fruith, " "
TR—Jas. B. Dick......Walsenburg, Colo.
MS—T. J. Stone, " "
SM—John Folie " "
SCO—Huerfano Trading Co., Buyer, John Kirkpatrick.
S of H—Mules and 1 air hoist; track gauge 36 in.
S of M—4 Comp air machines.
PP—6 Return tubular boilers total 800 H. P.; 2 pumps, power purchased.
Sales Agent, G. R. Houghtelin.

WILLIAMSBURG SLOPE COAL CO
Emerald Mines; Slope; Rockvale Lower Seam, 30 to 42 in. thick.
PO—Williamsburg, Colo; **SP**—Rockvale, Colo.; **CTY**—Freemont; **RR**—A. T. & S. F.
PR—S. P. Smith, Williamsburg; Colo.
GM—S. P. Smith, " "
MS—H. J. Smith, " "
TR—H. J. Smith, " "
PA—S. J. Smith, " "
EE—F. B. Smith....Williamsburg, Colo.
CE—J. Q. McNabb, " "
S of H—Steam loco. and mules. Track gauge 36 in.
S of M—1 Elec. mach. and hand.
PP—1 return tubular boiler, 90 H. P., 1 pump, 3 gen. units, 440 volts A. C., 3 phase, 60 cycles. Power purchased.
EMP—45. Last fiscal year output 18,858 tons.

THE WILLOUGHBY COAL & LAND CO.
Senator Mine; Shaft; Seam, 5 to 8 ft. thick.
PO—Lafayette, Colo.; **SP**—Same; **CTY**—Boulder; **RR**—C. B. & I.
PR—D. E. Evans, 337 Sherman St., Denver, Colo.
GS—D. E. Evans, 337 Sherman St., Denver, Colo.
PA—Oscar Padfield....Lafayette, Colo.
MS—R. W. Morgan, " "
CE—A. M. Hopkins, " "
S of H—Mules; track gauge 36 in.
S of M—Hand and 2 comp air mach.
PP—2 Water tube boilers total 120 H. P.; 1 comp., 2 pumps.
EMP—40. Last fiscal year output 30,000 tons.
Sales Agent, L. G. Hurlbert.

YAMPA VALLEY COAL CO.
General Office, 617-23 Gas and Electric Bldg, Denver, Colo.
Yampa Valley No. 1 and No. 2 Mines; Drifts; 4½ ft. to 11 ft. thick.
PO—Pallas, Colo.; **SP**—Same; **CTY**—Routt; **RR**—Denver & Salt Lake.
PR—P. M. Peltier......Denver, Colo.
TR John Connell.......Denver, Colo.
PA—P. M. Peltier,.......Denver, Colo.
MS—Clarence Harris......Pallas, Colo.
S of H Mules, rope by compressed air hoists, and gravity plane; track gauge 36 in
S of M—Hand and 4 comp. air mach.
PP—3 Kewanee water tube boilers. total 450 H. P., 1 Norwalk air comp. 2 pumps delivering water to the surface.
EMP—90. Last fiscal year output 122,000 tons.
Sales Agent, Big Four Coal & Coke Co., Denver, Colo.

ILLINOIS

For List of Abbreviations See Page 622.

ABBEY COAL CORPORATION
General Office, Collinsville, Ill.
Abbey Mine; Shaft; Belleville No. 6 Seam; 66 to 90 in. thick.
PO—Collinsville, Ill.; SP—Vandalia, Ill.; CTY—Madison; RR—Vandalia.
PR—Jesse Long.......Collinsville, Ill.
TR—Aug. C. Lohmann, " "
GM—F. H. Rice, " "
GS—F. H. Rice, " "
PA—F. H. Rice, " "
MS—Thomas Millet, " "
EM—Ray Hartmann, " "
S of H—Mules. Track gauge 19 in.
PP—1 John O'Brien and 1 Ruemmeli-Dawley return tubular boiler, total 153 H. P., 1 hoisting engine, 2 pumps.
EMP—21. Last fiscal year output 11,126.30 tons.

ALDEN COAL CO.
General Office, Davenport, Iowa.
PR—J. W. Gilchrist..Davenport, Iowa.
TR—J. W. Gilchrist, " "
GM—H. M. Gilchrist, " "
PA—H. M. Gilchrist, " "
EM—Arch Gilchrist......Norris, Ill.
GS—Arch Gilchrist, " "
MM—M. A. Bolton..Farmington, Ill.
SCO—Alden Coal Co., Buyer, Ray Kitzmiller, Norris, Ill.
Sales Agent, C. H. Crowe, Alden Coal Co., Davenport, Iowa.

Alden No. 5, Shaft, No. 5 Seam, 4 ft. thick.
PO—Farmington, Ill., SP—Same, CTY—Fulton; RR—C. B. & Q.
S of H—Mules; track gauge 28 in.
S of M—Hand.
PP—1 Pump, 4 Return tubular boilers, total 300 H. P., 1 gen. unit 110 volts, D. C., also buy power.
EMP—200. Output 113,463 tons. (170 days operation).

Alden No. 6, Shaft, No. 5 Seam, 4 ft. thick.
PO—Norris, Ill., SP—Same, CTY—Fulton; RR—C. B. & Q.
S of H—Mules and 2 gasoline loco; trock gauge 36 in.
S of M—Hand.
PP—3 Frost return tubular boilers, total H. P. 450, 2 gen. units 250 volts D. C., 1 pump.
EMP—170. Last fiscal year output 56,040 tons.

Alden No. 7, Shaft, No. 1 Seam, 6 ft to 2 ft. 8 in. thick.
PO—Matherville, Ill,; SP—Same, CTY—Mercer; RR—Rock Island and Southern.
MS—J.W. Gilchrist, Jr., Matherville, Ill.
S of H—Mules and 2 gasoline and 2 storage battery loco.; track gauge 36 in.
S of M—Hand.
PP—2 Pumps, 4 Return tubular boilers, total 350 H. P., 1 gen. unit, 110 volts D. C.
EMP—203. Last fiscal year output 137,765 tons.

Alden No. 8, Shaft, No. 5 Seam, 4 ft. thick.
PO—Farmington, Ill.: SP—Same, CTY—Fulton; RR—M. & St. L.
S of H—Mules; track gauge 36 in.
S of M—6 Elec. mach.
PP—2 return tubular boilers, total 300 H. P., 1—75 K. W. 250 volt steam Engine generator, 1—150 K. W. Rotary converter, 13,200 volts A. C., 3 phase, 250 volts D. C., 2 pumps. Purchase power.
EMP—98. Last fiscal year output 85,923 tons.

APPLEGATE & LEWIS COAL CO.
Leased to Logan Coal Company.

ASSUMPTION COAL & MINING CO. (THE)
No. 1 Mine, Shaft, No. 1 Seam, 5 to 3½ ft. thick.
PO—Assumption, Ill., SP—Same, CTY—Christian, RR—Illinois Central.
PR—Silas A. Shafer..Assumption, Ill.
TR—David Lacharite, " "
GM—Silas A. Shafer, " "
PA—Silas A. Shafer, " "
GS—T. H. Connolly, " "
EE—F. L. Taylor " "
EM—Glenn A. Shafer......Pana, Ill.
S of H—2 Elec. loco., track gauge 39½ in.
S of M—Hand and 3 elec. mach.
PP—4 Return tubular boilers, total 625 H. P., 250 volts, D. C.
EMP—175. Annual output 73,000 tons
Salesman, John H. Craig, Assumption, Ill

AUBURN & ALTON COAL CO.
Shaft Mine; No. 6 Seam, 84 in. thick.
PO—Auburn, Ill.; SP—Same; CTY—Sangamon; RR—C. & A.
PR—L. W. Senseney, ...Auburn, Ill.
GM—L. W. Senseney, " "
PA—L. W. Senseney, " "
TR—E. H. Senseney, " "
MS—Jas. Ibberson, " "
S of H—Mules; track gauge 30 in.
S of M—Hand.
PP—3 Cylinder boilers, total 100 H.P.
EMP—150. Last fiscal year output 100,000 tons.

BAILEY BROS. COAL CO.
Diamond Mine; Shaft; No. 6 Seam, 5 and 6 ft. thick.
PO—Sunfield, Ill.; SP—Du Quoin, Ill; CTY—Perry; RR—I. C.
GM—Jos. Bailey........Sunfield, Ill.
PA—Jos. Bailey, " "
SM—R. C. Saunders, " "
S of H—Mules.
S of M—Hand.
PP—2 Boilers.
EMP—25. Last fiscal year output 10,737 tons.

BELL & ZOLLER MINING CO.
General Office, 343 S. Dearborn St., Chicago, Ill.
Zeigler No. 1 Mine; Shaft; No. 6 Seam: 12 to 14 ft. thick.
PO—Zeigler, Ill.; SP—Same; CTY—Franklin; RR—I. C., C. B. & Q. St. L. I M. & S.
PR—H. E. Bell..........Chicago, Ill.
TR—W. G. Zoller, " "
GM—R. H. Zoller, " "
PA—J. E. Evans " "
CE—E. L. Berger, " "
EM—E. L. Berger, " "
EE—Fred Armstrong, " "
GS—Joseph Yeily..........Zeigler, Ill.
MS—Joseph Yeily, " "
SCO—Bell-Zoller Mining Co. Buyer, Joseph Yeily, Zeigler, Ill.
S of H—22 elec. locos. Track gauge 42 in.
S of M—29 elec. mach.
PP—6 water tube boilers, total 2400 H. P., 2 gen. units, 25 volts D. C., 3 air comp., 1 pump.
EMP—750. Last fiscal year output 816,929 tons.

BENTON COAL CO.
Benton Mine; Shaft; No. 6 Seam, 90 to 122 in. thick.
PO—Benton, Ill. SP—Same. CTY—Franklin; RR—C. & E. I. and I. C.
PR—P. A. Pearce..........Carmi, Ill.
TR—B. Schettler.........Benton, Ill.
GM—B. Schettler " "
GS—B. Schettler, " "
PA—B. Schettler, " "
EM—Byron Carpenter, " "
MM—Sam Pilson, " "
EE—Wm. Reinhart, " "
S of H—3 Elec. loco. Track gauge 42 in.
S of M—17 elec. mach.
PP—6 Return tubular boilers, total 900 H.P., 2 Gen. units, 250 volts, D. C., 1 pump.
EMP—437. Last fiscal year output 411,005 tons.
Sales Agency, Thomson & Burton Co., Chicago, Ill.

BENTON DISTRICT COAL CO.
Leased to John A. Logan Coal Co.

BERRY, B. F. COAL CO.
General Office, 1522 Ford Bldg. Detroit, Mich.
B. F. Berry No. 1 Mine; Shaft; No. 2 Seam; 35 to 40 in. thick. Operate washery.
PO—Standard, Ill.; SP—Same; CTY—Putnam; RR—C. M. & St. P., Chicago, Rochelle, & Oglesby Br.
PR—S. T. Crapo........Detroit, Mich.
TR—Cooper Wood, " "
GM—Cooper Wood, " "
GS—John T. Cherry......Standard, Ill.
PA—Chas. H. Sturgis.....Granville, Ill.
Mine MGR—J. H. Hoye, Standard, Ill.
MM—John Robinson, " "
S of H—Mule. Track gauge 41 in.
PP—6 Erie water tube boilers, total 900 H. P., 4 gen. units, 120 volts D. C., 1 pump.
EMP—460. Last fiscal year output 157,505 tons.

BESSEMER COAL & MNG. CO.
GM—Wm. Stevenson, ... Tilden, Ill.
PA—A. R. Lindsay, " "

Crystal Mine, Shaft, No. 6 Seam.
PO—Tilden, Ill. SP—Same. CTY—Randolph. RR—Ill. Central.
MS—John Hougland........Tilden, Ill.
S of H—Mules.
S of M—Hand.
EMP—60.
Tilden Mine, Shaft, No. 6 Seam.
PO—Tilden, Ill. SP—Same. CTY—Randolph. RR—Ill. Central.
MS—Ben B. Goddard.......Tilden, Ill.
S of H—Mules.
EMP—150.
S of M—Hand.

BIG CREEK COLLIERY CO.
General Office, People's Gas Bldg., Chicago, Ill.
PR—Chas I. Pierce, ... Chicago Ill.
Asst. to PR—Mont. S. Coleman, Harrisburg, Ill
SEC—H. E. Stuart.......Chicago, Ill.
GM—Chas. I. Pierce, " "
TR—J. B. Forbes, " "
PA—G. S. Patterson, " "
GS—Mont. Coleman........Canton, Ill.
EM—R. Williams, " "
CE—J. C. Quade.......St. David, Ill.
SCO—Big Creek Mercantile Co. Buyer, Sidney Martin, St. David, Ill.
Sales Agent, C. E. Kartstrom, Chicago, Ill.
Saline County Nos. 2, 3, and 6 Mines; Shaft; "No. 5" Seam; 5 to 7 ft. thick.
PO—Harrisburg, Ill.; SP—Same; Grayson, and Ledford, Ill.; CTY—Saline; RR Big Four, & L. & N.
MS—Geo. Morris, ... Harrisburg, Ill.
S of H—Rope, mules and elec. loco.
S of M—Elec. mach.
PP—15 boilers, total 2300 H. P., 250 to 275 volts D. C., 300 K. W. Purchase power.
EMP—1350. Last fiscal year output 1,200,000 tons.
Big Creek No. 6 Mine, Shaft; No. 5 Seam, 5 to 7 ft. thick.
PO—Grayson, Ill. SP—Same. CTY—Fulton. RR—Big Four and L.&N.
MS—Geo. Morris, ... Harrisburg, Ill.
S of H—Elec. locomotives.
S of M—Elec machines.
Big Creek No. 2 and 4 Mines, Slope and Shaft; "No. 5" Seam, 4½ to 5 ft. thick.
PO—St. David, Ill. and Dumfermline, Ill.; SP—Same; CTY—Fulton; RR—C. B. & Q.
MS—Patrick Hogan.....St. David, Ill.
S of H—Mules and elec. loco.
S of M—Elec. mach.
PP—11 boilers, total 1410 H. P., 250 volts D. C.
EMP—500. Last fiscal year output 500,000 tons.

Big Creek No. 3 Mine, Shaft; No. 5 Seam, 4½ to 5 ft. thick.
PO—Cuba, Ill.; SP—Same. CTY—Fulton. RR—C.B.&Q.
MS—Patrick Hogan......St. David, Ill.
S of H—Mules and rope.
S of M—Hand.
PP—3 boilers, total 400 H. P.
EMP—175.

BIG FOUR WILMINGTON COAL CO.
Closed down.

BIG MUDDY COAL & IRON CO.
General Office, St. Louis, Mo.
PR—O. L. Garrison......St. Louis, Mo.
TR—S. L. Sherer, " "
PA—S. L. Sherer. " "
GM—W. L. Schmick, " "

No 8 Mine; Shaft; No. 6 Seam; 72 to 132 in. thick. Operate washery.
PO—Clifford, Ill.; SP—Same; CTY—Williamson; RR—I. C., C. B. & Q., St. L. I. M.
MS—J. L. Pruett, ...Clifford, Ill.
MM—Geo. Kenner, " "
EE—H. Guard, " "
S of H—3 elec. and 1 storage battery loco. Track gauge 42 in.
S of M—4 comp. air mach.
PP—12 return tubular boilers, total 2000 H. P., 1 gen. unit, 250 volts D. C., 4 pumps, 2 air comp.
SCO—Clifford Store. Buyer, E. A. Kilbreth, Clifford, Ill.
EMP—468. Last fiscal year output, 453,589 tons.

No. 9 Mine; Shaft; No. 1 and 2 seams; 46 to 90 in. thick.
PO—Murphysboro, Ill.; SP—Same; CTY—Jackson; RR—Ill. Central.
MS—Hiram Wilson....Murphysboro, Ill.
MM—F. E. McFarland, " "
EE—Lee Mitchell, " "
SCO—Murphysboro Store. Buyer, Roy Palmer, Murphysboro, Ill.
S of H—3 elec. locos. Track gauge 42 in.
S of M—10 elec. mach.
PP—6 return tubular boilers, total 900 H. P., 2 gen. units, 250 volts D. C., 15 pumps.
EMP—208. Last fiscal year output 345,423 tons.

No. 7 Mine; Shaft; No. 6 Seam; 90 to 120 in. thick. Operate washery.
PO—Herrin, Ill.; SP—Same; CTY—Williamson; RR—I. C., C. B. & Q., St. L. I. M.
MS—H. D. Thompson......Herrin, Ill.
MM—S. A. Stowers, " "
EE—W. A. Jones, " "
SCO—Herrin Store. Buyer, Samuel Partington, Herrin, Ill.
S of H—Mules and 3 elec. locos. Track gauge 42 in.
PP—3 water tube boilers, total 1,050 H. P., 2 gen. units, 250 volts D. C.
EMP—430. Last fiscal year output 355,061 tons.

BIG MUDDY FUEL CO.
New Virginia Mine, Shaft, No. 7 Seam 7 to 8½ ft. thick; operate washery.
PO—Johnston City, Ill.; SP—Same; CTY Williamson; RR—C. & E. I., & I. C.
PR—W. L. Dunstan......Marion, Ill.
MS—W. L. Dunstan, " "
TR—Hogan Willeford, " "
PA—Hogan Willeford, " "
GM—Hogan Willeford, " "
SCO—Krauss Store Co. Buyer, H. O. Krauss, Johnston City, Ill.
S of H—Rope, elec. loco. and mules.
S of M—9 Elec. machines.
PP—4 water tube boilers, total 800 H.P., 2 gen. units, 250 volts D. C., 6 pumps.
EMP—200. Last fiscal year output 185,000 tons.
Sales Agency, Geo. G. Pope & Co., 203 S. Dearborn St., Chicago, Ill., and 801 Victoria Bldg., S. Louis, Mo.

BLACK DIAMOND COAL CO.
Black Diamond Mine, Vein No. 6, 7 to 9 ft. thick.
PO—Auburn, Ill., SP—Same, CTY—Sangamon; RR—C. & A.
PR—G. W. Solomon..Springfield, Ill.
TR—H. A. Solomon, " "
GM—G. W. Solomon, " "
PA—G. W. Solomon, " "
GS—P. H. Solomon, " "
S of H—4 elec. loco.; track gauge 42 in.
S of M—Hand.
PP—6 Return tubular boilers, total 950 H. P., 2 gen. units, 250 volts, D. C.

BLAIR, GUS., BIG MUDDY COAL CO. (THE)
Mines Nos. 1 and 2, Shafts; No. 2 Seam, 3½ to 7 ft. thick.
PO—Murphysboro, Ill.; SP—Same; CTY—Jackson; RR—Mobile & Ohio, and Mo. Pac.
PR—J. C. Hardy....Murphysboro, Ill.
TR—Gus Blair, " "
GM—Gus Blair, " "
PA—Gus Blair. " "
MS—J. H. Kane, " "
S of H—Mules and rope; track gauge 32 and 36 in.
S of M—8 Comp. air mach.
PP—3 return tubular boilers, total 150 H. P., 1 air comp. and 1 pump.
EMP—85. Last fiscal year output 60,661 tons.

BREESE-TRENTON MINING CO.
General Office, Breese, Ill.
PR—N. P. Pixley..........Flora, Ill.
TR—N. P. Pixley, " "
GM—Henry Hummert.......Breese, Ill.
PA—Aug. J. Hummert, " "
MS—Aug. J. Hummert, " "
MM—John Wehrman, " "
EE—Frank Wattson, " "

East Breese Mine; Shaft; No. 6 Seam; 90 in. thick.
PO—Breese, Ill.; SP—Same; CTY—Clinton; RR—B. & O., S. W.
S of H—Mules and 4 elec. locos.
S of M—5 elec. mach.
PP—8 water tube boilers, total 900 H. P., 1 eng. and 2 gen. units, 250 volts D. C., 2 pumps.
EMP—225. Last fiscal year output 250,000 tons.

Buxton Mine; Shaft; No. 6 Seam; 90 in. thick.
PO—Beckmeyer, Ill.; SP—Same; CTY—Clinton; RR—B. & O., S. W.
MS—Aug. J. Hummert......Breese, Ill.
S of H—Mules and 2 elec. locos.
S of M—7 elec. mach.
PP—6 water tube boilers, total 800 H. P., 1 eng. and 2 gen. units, 230 volts D. C., 2 pumps.
EMP—250. Last fiscal year output 200,000 tons.

BREWSTER & EVANS COMPANY.
Walben Mine, Slope, No. 5 Seam, 52 in. thick.
PO—Peoria, Ill., SP—So. Bartonville, Ill.; CTY—Peoria; RR—P.R.T.Ry.

PR—W. C. Evans........Peoria, Ill.
TR—B. D. Brewster, " "
CE—J. A. Ede..........LaSalle, Ill.
MS—W. C. Evans........Peoria, Ill.
S of H—Mules and 2 elec. loco. Track gauge 42 in.
S of M—Hand.
PP—Power purchased.
EMP—227. Last fiscal year output 229,810 tons.
Sales Agent, David Rutler & Co., Chicago, Ill.

BUNSEN COAL CO.

General Office, So. La Salle St., Chicago, Ill.
3 Mines in Illinois, 1 Mine in Indiana.
PR—W. H. Clingerman, Carnegie Bldg., Pittsburgh, Pa.
TR—C. S. Wardley, ...Chicago, Ill.
Secy—C. S. Wardley, " "
PA—J. C. Hoot, " "
GS—Thomas Moses......Westville, Ill.
EM—A. F. Allard, " "

Vermillion Mine; Shaft, No. 6 Seam, 72 in. thick.
PO—Westville, Ill.; SP—Georgeown, Ill.; CTY—Vermillion; RR—C. C. C. & St. L.
S of H—3 Elec. loco.; track gauge 38 in.
S of M—21 Elec. mach.
PP—7 return tubular boilers, total 1650 H. P., 3 gen. units D. C., 1 pump.

Kelly No. 3 Mine Shaft Seam No. 6; 72 in. thick.
PO—Westville, Ill.; SP—Same CTY—Vermillion; RR—C C. C. & St. L., C. & E. I.
S of H—2 Elec. loco.; track gauge 36 in.
S of M—12 Elec. mach.
PP—4 Return tubular boilers, total 600 H. P., gen. unit D. C.

Kelly No. 4 Mine; Shaft, No. 6 Seam, 72 in. thick.
PO—Wesville, Ill.; SP—Same CTY—Vermillion; RR—C. & E. I.
S of H—4 Elec. loco.; track gauge 36 in.
S of M—Hand.
PP—5 Return tubular boilers, total 750 H. P., gen. unit D. C., 2 pumps.

CANTON COAL CO.

Drake's Mine; Shaft; No. 5 Seam, 5 ft. thick.
PO—Canton, Ill., SP—Same, CTY—Fulton; RR—C. B. & Q.
PR—S. A. Drake.........Canton, Ill.
TR—H. L. Reiplinger, " "
GM—S. A. Drake, " "
GS—S. A. Drake, " "
PA—H. L. Reiplinger, " "
EE—Jos. [illegible], " "
MS—H. C. Hindson, " "
S of H—Mules and 2 elec. loco.
S of M—Hand and 1 elec. mach.
PP—2 Water tube boilers, total 250 H. P., 1 gen. unit, 250 volts, A. C., 60-cycle, 2 pumps, also purchase power.
EMP—225.
Sales Agent, S. A. Drake.

CANTRALL CO-OPERATIVE CO.

SUPT—P. M. Barteline, Springfield, Ill.

Cantrall Mine, Shaft, No. 5 Seam, 5½ to 6½ ft. thick.
PO—Cantrall, Ill.; SP—Same; CTY—Sangamon; RR—C. P. & St. L.
MS—Robt. Robinson.....Cantrall, Ill.
S of H—1 8-ton elec. loco.; track gauge 35½ in.
S of M—Hand.
PP—3 Cylinder water tube and 1 tubular boiler, 4 gen. units.
EMP—147. Last fiscal year output 58,000 tons.
Note—Idle since May 15th, 1915. Expect to resume operations shortly.

CAPITAL COAL CO.

Receiver, Latham T. Souther, Springfield, Ill.
Capital No. 2 Mine, Shaft; No. 5 Seam; 5 ft. 10 in. to 6 ft. thick.
PO—Springfield, Ill.; SP—Same; CTY—Sangamon; RR—I. C., B. & O., S. W., C. H. & D. & Ill. Traction System.
PR—P. F. Murphy....Springfield, Ill.
GM—P. F. Murphy, " "
GS—P. F. Murphy......Springfield, Ill.
PA—P. F. Murphy, " "
TR—W. M. Ryan, " "
MS—Patrick Walsh, " "
EM—Patrick Walsh, " "
MM—F. Barton, " "
EE—F. Barton, " "
S of H—2 Elec. loco. and rope; track gauge 36 in.
S of M—Hand and 3 comp. air mach.
PP—4 Springfield return tubular boilers, total 600 H. P., 1 gen. unit, 250 volts, D. C.; 1 pump.
Chicago, Ill.
EMP—367. Last fiscal year output 250,000 tons.
Sales Agent, Edwards & Bradford & Co.,

CARBON HILL COAL CO

Stripping Mine, Seam 72 in. thick.
PO—Danville, Ill.; SP—Same; CTY—Vermillion; RR—I. T. S., Big Four, Wabash.
PR—W. G. Hartshorn, Danville, Ill.
TR—W. G. Hartshorn, Jr., " "
GM—J. A. Swanberg, " "
GS—J. A. Swanberg, " "
PA—J. A. Swanberg, " "
MS—John Donaldson, S. Danville, Ill.
MM—John Donaldson, " " "
S of H—1 Steam loco.
PP—Power purchased.
EMP—50.
Sales Agency, Electric Coal Co., J. A. Swanberg, Danville, Ill.

CARLINVILLE COAL CO., (THE)

Carlinville Mine, Shaft, No. 6 Seam, 7 ft. thick.
PO—Carlinville, Ill., SP—Same, CTY—Macoupin; RR—C. & A. R. R., I. C. & St. L.
PR—W. G. Bartels....Carlinville, Ill.
TR—A. L. Hoblit, " "
GM—W. G. Bartels, " "
PA—W. G. Bartels, " "
GS—W. G. Bartels, " "
CE—Frank Gowin, " "
MS—John Falcetti.........Virden, Ill.
SCO—The Carlinville Coal Co., Buyer, W. G. Bartels, Carlinville, Ill.
S of H—Mules and 1 elec. loco. Track gauge 2 ft.
S of M—Hand.
PP—2-cylinder, 1-flue, 310 H. P. boiler.
EMP—120. Last fiscal year output 47,690 tons.
Sales Agent, W. G. Bartels.

CARTERVILLE COAL CO.

PO—Carterville, Ill.; SP—Same; CTY—Williamson; RR—Ill. Cent., Paducah Div.
Wm. E. Trautmann, Receiver, St. Louis, Mo.

CARTERVILLE & BIG MUDDY COAL CO.

Receiver, Fred W. Richards, Carterville, Ill.
John Mine; Shaft; No. 6 Seam; 102 to 108 in. thick.
PO—Cambria, Ill.; SP—Same; CTY—Williamson; RR—Illinois Central, Johnson City Br.
PR—Ed. A. Ellis....Carterville, ...Ill.
TR—E. E. Mitchell.....Carbondale, Ill.
MS—John J. Thomas......Cambria, Ill.
GM—Fred W. Richards, " "
S of H—Mules and 2 elec. loco. Track gauge 36 in.
S of M—Hand.
PP—4 return tubular boilers, total 450 H. P., 1 gen. unit, 250 volts D. C., and 2 pumps.
EMP—140.
Note—Mine closed down greater part of year.
Sales Agent, Frank Bennett.

CARTERVILLE DISTRICT COAL CO.

No. 1 Mine; Shaft; Seam, 8 ft. thick.
PO—Marion, Ill.; SP—Johnston City, Ill.; CTY—Williamson; RR—C. & E. I., Sou, I. M.
No report.

CARTERVILLE & HERRIN COAL CO.

Jeffrey Mine, Shaft, No. 7 Seam, 9 to 12 ft. thick.
PO—Herrin, Ill.. SP—Same, CTY—Williamson; RR—I. C. and I. M.
PR—W. C. Alexander, Murphysboro, Ill.
TR—John Alexander.......Herrin, Ill.
GM—John Alexander, " "
PA—John Alexander, " "
GS—John Alexander, " "
MM—John Masters, " "
MS—Richard Dawson, " "
SCO—The Chew Mercantile Co., Buyer, A. T. Chesney, Herrin, Ill.
S of H—Mules and 1 gasoline motor; track gauge 36 in.,
S of M—Hand.
PP—3 pumps, 2 return tubular boilers, total 300 H. P.
EMP—212. Last fiscal year output 166,558 tons.
Sales Agent, Geo. C. Simpson, 1740 Monadnock Block, Chicago, Ill.,

CENTRALIA COAL CO.

No. 5 Mine, Shaft, No. 6 Seam, 6 to 7 ft. thick.
PO—Centralia, Ill.; SP—Same; CTY—Marion; RR—I. C., B. & O. S. W.
PR—H.E.Bell, 343 S.Dearborn S.,Chi.Ill
TR—R.H.Zoller " " " "
GM—R.H.Zoller " " " "
PA—J.E.Evans, " " " "
MS—H. G. Brown......Centralia, Ill
MM—S. A. Melhuish, " "
EE—Chas. McMillian, " "
EM—E. L. Berger.........Ziegler, Ill.
S of H—11 Elec. loco.; track gauge 42 in
S of M—Hand and 5 elec. machines.
PP—7 O'Brien return tubular boilers, total 900 H. P., 2 gen. units, 250 volts D. C., 1 pump.
EMP—500. Last fiscal year output 480,000 tons.
Sales Agent, W. W. Ritchey, 343 S. Dearborn St.., Chicago, Ill.

CHAMPION COAL CO.

Out of business.

CHICAGO SANDOVAL COAL CO.

General Office, 507 McCormick Bldg., Chicago, Ill.
Nos. 1 and 2 Mines, Shaft.
PO—Sandoval, Ill.; SP—Same; CTY—Marion; RR—I. C. and C. B. Q.
TR—C. Newton..........Chicago, Ill.
PA—Chas. B. Cone, " "
MS—Geo. A. Smith......Sandoval, Ill.
S of H—No 1, tail rope and mules, (No. 2), gasoline motors and mules.
S of M—Hand.
PP—7-Boilers, total 1050 H. P., 2 Litchfield hoisting engines.

CHICAGO, SPRINGFIELD COAL CO.

C-S Mine, Shaft; No. 5 Seam, 6 ft. thick.
PO—Springfield, Ill.; SP—Same; CTY—Sangamon; RR—Chicago & Alton.
PR—H. H. Devereux....Springfield, Ill.
PA—H. H. Devereux, " "
TR—G. A. Wood, " "
MS—Robert Lindsay, " "
S of H—Mules and 1 gasoline loco.
EMP—320. Last fiscal year output 330,000 tons.
PP—4 Return tubular boilers, 2-Erie, 2-O'Brien, 1 pump.
S of M—Hand.

CHICAGO, WILMINGTON & FRANKLIN COAL CO.

General Office, McCormick Bldg., Chicago, Ill.
PR—George B. Harrington..Chicago, Ill.
GM—George B. Harrington, " "
TR—W. W. Beckett......Boston, Mass.
GS—T. F. Holmes...........Orient, Ill.
PA—L. D. Smith.........Chicago, Ill.
MS—Joseph Louis..........Orient, Ill.
EM—W. D. Burnett, " "
CE—Allen & Garcia.......Chicago, Ill.
SCO—Miners Supply Co., Chicago, Ill. Buyer, W. F. Schaffer, Thayer, Ill.

Orient No. 1 Mine; Shaft; No. 6 Seam; 96 to 126 in. thick.
PO—Orient, Ill.; SP—W. Frankfort, Ill. CTY—Franklin; RR—C. & E. I., C. B. & Q., I. C., Orient Spur br.
S of H—16 elec. and 1 steam loco. Track gauge 42 in.
S of M—18 elec. mach.
PP—5 Wickes water tube boilers, total 2000 H. P., 3 gen. units, 275 volts D. C., 3 pumps, 1 air comp.
EMP—550. Last fiscal year output 531,448 tons.

Thayer No. 1 Mine; Shaft; No. 6 Seam; 72 to 84 in. thick.
PO—Thayer, Ill.; SP—Same; CTY—Sangamon; RR—C. & A., C. B. & Q., I. T. S., C. & N. W.
MS—John Marland........Thayer, Ill.
S of H—Mules and 8 elec. locos. Track gauge 42 in.
S of M—14 elec. mach.
PP—4 Wickes water tube boilers, 1200 H. P., 3 gen. units, 275 volts D. C. 1 pump.
EMP—500. Last fiscal year output 476,250 tons.

South Wilmington No. 3 Mine; Shaft; No. 2 Seam; 36 in. thick. Operate washery.
PO—So. Wilmington, Ill.; SP—Same; CTY—Grundy; RR—E. J. & E.
MS—George Notman, So. Wilmington, Ill.
SM—J. R. Howalt, " "
S of H—Mules.
PP—6 Wickes return tubular boilers, total 650 H. P., 1 gen. unit, 220 volts A. C., 1 pump.
EMP—500. Last fiscal year output 219,984 tons.

Royal Colliery Co. Mine; Shaft; No. 6 Seam; 72 to 90 in. thick. Operate washery.
PO—Virden, Ill.; SP—Same; CTY—Macoupin; RR—C. B. & Q., C. & A., C. & N. W.
MS—William Earle........Virden, Ill.
SM—O. C. Grimmett.......Virden, Ill.
S of H—Mules and 3 elec. locos.
S of M—15 elec. mach.
PP—7 water tube boilers, total 1050 H. P., 1 gen. unit, 275 volts D. C., 1 pump.
EMP—450. Last fiscal year output 470,240 tons.

CHICAGO, WILMINGTON & VERMILLION COAL CO.

Now Chicago, Wilmington & Franklin Coal Co.

CHICAGO & BIG MUDDY COAL & COKE CO.

General Office, 2017 Fisher Bldg., Chicago, Ill.
PR—A. B. McClaren,......Marion, Ill.
GS—A. B. McClaren, " "
PA—A. B. McClaren, " "
TR—F. C. Honnold.......Chicago, Ill.
GM—F. C. Honnold, " "
EM—Roy Adams...........Herrin, Ill.
MM—W. Dawkins.........Marion, Ill.
EE—E. M. Johnson, " "

Big Muddy Mine; Shaft; No. 6 Seam; 84 to 132 in. thick.
PO—Marion, Ill.; SP—Same; CTY—Williamson; RR—C. & E. I., C. B. & Q. and Iron Mt.
S of H—Mules and 3 elec. locos. Track gauge 36 in.
S of M—7 elec. mach.
PP—4 water tube boilers, total 600 H. P., gen. unit, 250 volts D. C., 2 pumps. Purchase power.
Last fiscal year output 250,000 tons.

New Enterprise Mine; Stripping; No. 6 Seam; 84 to 120 in. thick.
PO—Marion, Ill.; SP—Same; CTY—Williamson; RR—C. B. & Q. and Mo. Pacific.
S of H—1 steam loco.
PP—Purchase power.
Last fiscal year output 97,800 tons.

CHICAGO & CARTERVILLE COAL CO.

General Office, Herrin, Ill.
PR—James Pease.........Chicago, Ill.
TR—E. E. Mitchell........Herrin, Ill.
GM—E. E. Mitchell, " "
PA—E. E. Mitchell, " "
EM—R. E. Mitchell, " "
MM—C. F. Saylor, " "
EE—Thomas Thornton, " "
SCO—Chicago & Carterville Coal Co. Store. Buyer, B. F. Bowen, Herrin, Ill.

Mine "A"; Shaft; No. 6 Seam; 84 to 132 in. thick. Operate washery.
PO—Herrin, Ill.; SP—Same; CTY—Williamson; RR—I. C., C. B. & Q., Mo. Pac.
MS—Evan D. John.........Herrin, Ill.
SM—B. F. Bowen, " "
S of H—Mules and 5 elec. locos. Track gauge 42 in.
S of M—32 comp. air mach.
PP—4 O'Brien and Heine water tube boilers, total 1250 H. P., one 170 K. W. and one 500 K. W. turbine, 250 volts D. C., 2 air comp. and 2 pumps.
EMP—400. Last fiscal year output, 194,154 tons.

Mine "B"; Shaft; No. 6 Seam; 72 to 132 in. thick.
PO—Herrin, Ill.; SP—Same; CTY—Williamson; RR—C. B. & Q. & I. C.
MS—Evan D. John,........Herrin, Ill.
SM B. F. Bowen, " "
S of H—Mules and 2 elec. locos. Track gauge 36 in.
PP—1 O'Brien water tube boiler, 2 return tubular boilers, total 500 H. P., one 100 K. W. generator, 250 volts D. C., 1 pump.
EMP—300. Last fiscal year output 211,575 tons.

CHIME COAL CO.

See Granger Coal Co.

CHRISTIAN COUNTY COAL CO.

Shaft; No. 6 Seam; 9 ft. thick.
PO—Taylorville, Ill.; SP—Same; CTY—Christian; RR—Wabash.
PR—W. D. Johnston..Taylorville, Ill.
TR—Roy A. Johnston, " "
GM—W. S. Ridgly, " "
GS—W. S. Ridgly, " "
PA—F. F. Baughman, " "

MS—Mike Rozaiski, " "
S of H—Mules & 4 elec loco.; track gauge 42 in.
S of M—Hand.
PP—6 Water tube boilers total 900 H. P., 1 gen. unit.
(Old information.)

CHRISTOPHER COAL MINING CO.

General Office, 72 W. Adams St., Chicago, Ill.
Nos. 1 and 2 Mines; Shafts; No. 6 Seam, 108 to 121 in. thick.
PO—Christopher, Ill.; SP—Same. CTY—Franklin; RR—C. B. & Q.
PR—Fred Schroeder, 72 W. Adams St., Chicago, Ill.
GM—Fred Schroeder, 72 W. Adams St., Chicago, Ill.
PA—F. A. Tufford, 72 W. Adams St., Chicago, Ill.
TR—Niels Buck, 105 La Salle St., Chicago, Ill.
GS—E. E. Jacobs......Christopher, Ill.
MM—Geo. R. Jacobs, " "
EE—A. W. Spaht, " "
EM—L. T. Putnam.....Benton, Ill.
S of H—31 elec. locos.; track gauge 42 in.
S of M—50 elec. mach.
PP—3 Water tube and 8 return tubular boilers, total 3550 H. P., 750 K. W., 5 gen. units 250 volts D. C., 250 volts A. C., 3 phases, 60 cycles.
EMP—1,000. Output about 7,000 tons per day.

CITIZENS' COAL MINING CO.

A and B Mines; Shaft; No. 5 Seam, 72 in. thick.
PO—Springfield, Ill.; SP—Same; CTY—Sangamon; RR—C. P. & ST L.
PR—John H. Boutjes———Peoria, Ill.

(Continued on Next Page.)

Citizens Coal Mining Co.—Cont.
TR—W. T. Becker.......Springfield, Ill.
GM—Jos. Hann, " "
GS—Jos. Hann, " "
MS—Lawrence Denny, " "
S of H—2 Elec. loco. and mules.
S of M—Hand.
Sales Agency, B. & B. Coal Co. Peoria, Ill.

CITY COAL CO. OF EDWARDSVILLE.
No. 3 Mine; Shaft, No. 6 Seam, 6 ft. 5 in. thick.
PO—Edwardsville, Ill.; SP—Same; CTY—Madison; RR—L. & M., I. T. T. St. L. & W. Wab.
GM—F. W. Herzog....Edwardsville, Ill.
MS—F. W. Herzog, " "
PA—F. W. Herzog, " "
S of H—Mules.
S of M—Comp. air mach.
PP—2 Boilers, total 140 H. P., 1 pump.
EMP—30. Last fiscal year output 24,530 tons.

CLARK COAL & COKE CO.
General Office, Peoria, Ill.
Empire No. 2 Mine, Shaft, No. 5 Seam, 4 ft. thick.
PO—Peoria, Ill., SP—Maxwell, CTY—Peoria, RR—M. & St. L.
PR—Horace Clark.........Peoria, Ill.
GS—J. M. Tyson........Peoria, Ill.
CE—Allen & Garcia.......Chicago, Ill.
SB—Guy Hudson.......Hanna City, Ill
S of H—Mules and 5 elec. loco.; track gauge 36 in.
S of M—Hand.
PP—1 Pump, 5 return tubular boilers, 750 H. P., 2 gen. units 250 volt. D. C.
EMP—275. Last fiscal year output 180,000 tons.
Sales Agent, M. R. Coleman, Peoria, Ill.

CLOVER LEAF COAL MINING CO.
Clover Leaf No. 2 Mine; Shaft; No. 6 Seam; 90 in. thick.
PO—Coffeen, Ill.; SP—Same; CTY—Montgomery; RR—T. St. L. & W.
PR—J. L. Mitchell .....Royalton, Ill.
EM—D. W. Mitchell " "
TR—A. M. Pfisterer......St. Louis, Mo.
PA—A. M. Pfisterer " "
MS—E. Prudent ....Coffeen, Ill.
S of H—Mules and 1 elec. loco. Track gauge 42 in.
S of M—Hand and 3 elec. machines.
PP—4 return tubular boilers (O'Brien), total 2400 H. P., 1 gen. unit, 250 volts D. C., 1 pump.

COAL CREEK MINING CO.
General Office, Galesburg, Ill.
Perrville Mine, Drift. No. 5 Seam, 5 ft. 2 in. to 4 ft. 6 in. thick.
PO—Fairview, Ill. SP—Same. CTY—Fulton. RR—C.B. & Q. Havana Branch.
PR—Thomas Fairbairn .. Streator, Ill.
TR—R. J. Fairbairn.....Galesburg, Ill.
PA—R. J. Fairbairn, " "
MS—Joe Frankovich......Fairview, Ill.
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—1 gasoline engine for fan.
EMP—24. Last fiscal year output 25,174 tons.
Sales Agent, W. R. Hawkins, Galesburg, Ill.

COAL VALLEY MINING CO.
General Office, 139 W. Van Buren St., Chicago, Ill.
PR—Carl Scholz, 139 W.Van Buren St., Chicago, Ill.
GM—Carl Scholz, 139 W.Van Buren St., Chicago, Ill.
TR—G. H. Crosby, 139 W. Van Buren St. Chicago, Ill.
PA—H.S.Mikesell, 139 W.Van Buren.St., Chicago, Ill.
ASST GM—H. S. Mikesell, Chicago, Ill.

Sherrard Mine No. 2, Shaft, No. 1 Seam, 3 ft. 8 in. thick.
PO—Sherrard, Ill., SP—Same, CTY—Mercer; RR—C. R. I. & P. Ry.
MS—Robt. E. Lee.....Sherrard, Ill.
S of H—1 Elec. loco.
S of M—2 Elec. mach. and hand.
EMP—142. Last fiscal year output 75,001 tons.

Mathersville Mine No. 3, No. 1 Seam, 4 ft. thick.
PO—Mathersville, Ill., SP—Same, CTY—Mercer; RR—R. I., Sou Ry. System.
MS—Robt. E. Lee.........Sherrad, Ill.
S of H—1 Elec. loco.
S of M—Hand, and 2 elec. mach.
PP—7 Kewanee return tubular boilers, total 1100 H. P., 4 gen. units, 250 volts D. C.
EMP—215. Last fiscal year output 124,238 tons.

COLFAX CO-OPERATIVE CO.
West or No. 1 Mine, Shaft; No. 6 Seam, 6 ft. thick.
PO—Colfax, Ill. SP—Same. CTY—McLean. RR—I.C., Bloomington & Kankakee Branch.
PR—J. J. Goodrich........Peoria, Ill.
GM—Edw. Keefe..........Coalfax, Ill.
TR—Ralph C. Sells, " "
GS—Edw. Keefe, " "
PA—R. C. Sells, " "
MS—Edw. Keefe..........Colfax, Ill.
EM—D. A. Wood, " "
S of H—Mules. Track gauge 35 in.
S of M—Hand.
PP—3 boilers, total 120 H.P. 1 pump.
EMP—25. Last fiscal year output 15,820 tons. Sales agent, J. L. Barnes, Colfax, Ill.

COLLIER CO-OPERATIVE COMPANY.
Shaft Mine, No. 5 Seam, 4 ft. 4 in. thick.
PO—5912 S. Adam St., Bartonville, Ill.
SP—Acme Station. CTY—Peoria. RR—P. & P. W.
PR—Henry Brown, ... Bartonville, Ill.
TR—W. Brown, " "
GM—J. Appleby, " "
GS—J. Appleby, " "
PA—J. Appleby, " "
CE—J. Jacobs, " "
EM—J. Jacobs, " "
S of H—Mules and 1 Milwaukee gasoline motor. Track gauge 30 in.
S of M—Hand.
PP—2 Pumps, 2 boilers, 70 H.P.
EMP—40. Annual output, 50,000 tons.

CONSOLIDATED COAL CO. OF ST. LOUIS.
General Office, St. Louis, Mo.
PR—Kingdon Gould, New York, N. Y
TR—A. W. Carr, ... St. Louis, Mo.
GM—W. J. Jenkins, " " "
GS—J. H. Shaw, " " "
PA—D. Simpson, " " "
EM—C. L. Moorman, " " "
Sales agents, T. D. Payne, Chicago, Ill. and C. M. Snow, St. Louis, Mo.

No. 7 and No. 14 Mines, Shaft, No. 6 Seam, 8 to 10 ft. thick. Operate washery.
PO—Staunton, Ill. SP—Same. CTY—Macoupin. RR—Wabash, L.& M., C. & N. W.
MS—F. E. Weissenborn, Staunton, Ill.
S of H—Mules and motor.
S of M—Comp. air and Elec. mach.
PP—(14) 12 boilers, total 1800 H. P.

No. 15 Mine, Shaft, No. 6 Seam, 96 to 120 in. thick.
Operates washery.
PO—Mt. Olive, Ill. SP—Same. CTY—Macoupin. RR—Wabash.
MS—F. E. Weissenborn, Staunton, Ill.
S of H—Elec and mules.
S of M—Comp. air and Elec. mach.

No. 17 Mine, Shaft, No. 6 Seam, 8 to 10 ft. thick. Operate washery.
PO—Collinsville, Ill. SP—Same. CTY—St. Clair, RR—Vandalia.
MS—P. Grieve, ... Collinsville, Ill.
S of H—Mules.
S of M—Comp. air.

Breese Mine, No. 6 Seam, 8 to 10 ft. thick.
PO—Breese, Ill. SP—Same. CTY—Clinton. RR—B. & O., S. W.
MS—P. Grieve, ... Collinsville, Ill.

Lake Creek Mine, No. 7 Seam 8 ft. thick.
PO—Johnson City, Ill. SP—Same. CTY—Williamson. RR—Mo. Pac.
MS—Jas. Bowie......Johnson City, Ill.

CONTRACT MINING CO.
Western Brick Co. Mine; Slope; No. 7 Seam, 72 in. thick.
PO—Danville, Ill.; SP—Big Four, Ill.; CTY—Vermillion, Ill.; RR—Big Four.
PR—Jas. Doughty, ... Danville, Ill.
TR—Ed. Reilly, " "
GS—Ed. Reilly, " "
EM—Wesley Anderson, " "
EE—Wesley Anderson, " "
S of H—1 Steam and 1 Elec. loco.; track gauge 36 in.
S of M—Hand.
PP—220 volts, D.C., 6 boilers, total 900 H. P. Power purchased.
EMP—60. Last fiscal year output 69,000 tons.

CO-OPERATIVE COAL CO. (THE)
Fairbury, Ill. No report.

CORA COAL COMPANY.
General Office, ... Springfield, Ill.
No report.

CRESCENT CITY COAL & COKE CO.
PO—Equality, Ill.; CTY—Gallatin.
No report.
Note—Idle during past year.

CRESCENT COAL CO.
Crescent No. 1 Mine, Drift.
PO—Peoria, Ill. SP—Same. CTY—Peoria. RR—C.B.&Q.
PR—Wm. Swords..........Peoria, Ill.
GM—M. E. Case, " "
PA—M. E. Case, " "
EM—Chas. Dunn, " "
MS—Geo. Deemy, " "
S of H—Elec.
S of M—Elec.
PP—250 volts D.C.
EMP—250. Last fiscal year output 131,268.90 tons.

DANVILLE COLLIERY COAL CO.
Catlin Mine, Shaft, No. 7 Seam, 6 ft. thick.
PO—Catlin, Ill. SP—Same. CTY—Vermilion. RR—Wabash.
PR—B.B. Taylor, ... Catlin, Ill.
TR—B. B. Taylor, " "
GM—B. B. Taylor, " "
PA—B. B. Taylor, " "
GS—Jas. Siddell, " "
EM—Jas. Siddell, " "
MM—R. Cornellous, " "
S of H—Mules and Elec. loco.
S of M—Hand.
PP—2 Water tube boilers, 300 H.P.
EMP—140. Last fiscal year output 101,000 tons. Sales agent, B. B. Taylor.

DECATUR COAL CO. (THE)
PR—L. A. Mills, ... Decatur, Ill.
TR—J. H. Howard, " "
GM—W. C. Armstrong, "
GS—W. C. Armstrong......Decatur, Ill.
PA—W. C. Armstrong, "

No. 1 Mine; Shaft; No. 5. Seam, 4½ ft. thick.
PO—Decatur, Ill. SP—Same. CTY—Macon. RR—I.C., Vandalia, C. H. & D.
MS—Thos. Clark, ... Decatur, Ill.
S of H—Mules. Track gauge 3 ft.
S of M—Hand.
PP—4 boilers, total 100 H. P., and 2 pumps.

No. 2 Mine; Shaft; No. 5 Seam, 4 in. thick.
PO—Decatur, Ill.; SP—Same; CTY—Macon; RR—I. C. and Vandalia Line.
MS—Edmond Clark........Decatur, Ill.
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—3 Return tubular boilers. total 300 H. P., and 2 pumps.

DE SOTO-PEACOCK COAL CO.
Shaft Mine; Seam, 132 to 156 in. thick.
PO—De Soto, Ill.; SP—Same; CTY—Jackson; RR—I. C.
GM—Chas. M. Hart......De Soto, Ill
GS—Chas. M. Hart, " "
MS—Wm Neal, " "
S of H—Mules; track gauge, 26 in.
S of M—Hand.
PP—Boiler, 80 H. P.; 1 pump.
Last fiscal year output 21,000 tons.

DIMOND, JESSE, COAL CO.
PO—Benton, Ill.
Have not yet commenced development.

DONALY-KOENNECKE COAL CO.
Out of business.

DONK BROS. COAL & COKE CO.
General Office, 314 N. 4th St., St. Louis, Mo.
GM—Edwin H. Courades..St. Louis, Mo.

Donkville Mine, Shaft, No. 6 Seam. RR—St. Louis, Troy & Eastern.
MS—H. C. Perry, .. Collinsville, Ill.
PP—6 boilers, 600 H.P.
EMP—300.

Maryville Mine, Shaft, No. 6 Seam.
PO—Maryville, Ill. SP—Same. CTY—Madison. RR—St. Louis, Troy & Eastern.
S of H—Elec.
S of M—Hand.
PP—9 boilers, 900 H.P.
EMP—450.

Troy Mine, Shaft, No. 6 Seam.
PO—Troy, Ill. SP—Same. CTY—Madison. RR—St. Louis, Troy & Eastern.
S of H—Elec.
S of M—Comp. air.
PP—4 boilers, 400 H.P.
EMP—347.

DORRISVILLE COAL CO.
Harrisburg, Ill. No report.

DOZAW VALLEY COAL CO.
Dozaw Valley Mine; Shaft; No. 6 Seam, 60 to 96 in. thick.
PO—Marissa, Ill.; SP—Same; CTY—St. Clair; RR—I. C.
PR—Henry McCarnes......Marissa, Ill.
TR—George F. Dryden, " "
PA—George F. Dryden, " "
GS—George F. Dryden, " "
GM—Henry McCarnes, " "
MS—Henry McCarnes, " "
EE—Geo. Myers. " "
S of H—1 Gasoline motor and mules; track gauge, 32 in.
S of M—Hand.
PP—2 Return tubular boilers, total 200 H. P., 1 pump.
EMP—40. Last fiscal year output 25,000 tons.
Successors to the Forsyth Coal Co.

DURHAM COAL CO.
Galatia No. 1 Mine; Shaft; No. 7 Seam, 66 in. thick.
PO—Galatia, Ill.; SP—Same; CTY—Saline; RR—I. C., Eldorado Br.
PR—Leonard W. Ingham..Clinton, Ill.
TR—W. A. Durham......Galatia, Ill.
PA—W. A. Durham, " "
GM—B. A. Durham, " "
Successors to the Galatia Coal Co.

EAGLE MINING CO.
Eagle Mine, Shaft, No. 5 Seam, 5 ft. thick.
PO—Canton, Ill. SP—Same. CTY—Fulton. RR—T.P.&W.
PR—H. W. Lynch..........Peoria, Ill.
TR—H. W. Lynch, " "
GM—E. B. Hale, " "
PA—E. B. Hale, " "
MS—Thos. Parsell.........Canton, Ill.
S of H—Mules, 1 gasoline motor. Track gauge 35 in.
S of M—Hand.
PP—3 Return tubular boilers, total 250 H. P., 3 pumps.
EMP—175. Last fiscal year output 90,000 tons. Sales agent, H. W. Lynch, Peoria, Ill.

EDWARDSVILLE HOME TRADE COAL CO.
Home Trade Mine; Shaft: No. 7 Seam, 48 to 72 in. thick.
PO—Edwardsville, Ill.; SP—Same; CTY—Madison; RR—Wab.
PR—Frank Lannar, ...Worden, Ill.
GM—Frank Lannar, " "
GS—Frank Lannar, " "
TR—George B. Worden, Edwardsville, Ill.
PA—George B. Worden, " "
S of H—Mules; track gauge 24 in.
S of M—Hand.
PP—1 Pump.
EMP—48. Last fiscal year output 34,000 tons.

EGYPTIAN COAL MNG. CO.
General Office, 319 Mermod & Jaccard Bldg., St. Louis, Mo.
Advance and Meek Mines, No. 7 Seam, 7 ft. thick.
PO—Marissa, Ill. SP—Same. CTY—St. Clair. RR—I.C.
PR—J. A. Hamilton, .. Marissa, Ill.
TR—A. C. Smith, ...St. Louis, Mo.
GM—W. E. Meek, ... Marissa, Ill.
MS—John W. Williams, " "
S of H—Mules. Track gauge 32 in.
S of M—Hand and 6 elec. mach.
NOTE—Oak Ridge Mine idle temporarily account top works burned. Mine equipped elec. haulage.

ELDNAR COAL CO.
Eldnar Mine, Shaft, Seam 7 ft. thick.
PO—Belleville, Ill. SP—Same. CTY—St. Clair. RR—L.&N., O'Fallon Branch.
PR—Jos. Randle, ... Belleville, Ill.
TR—Wm. Randle, " "
PA—Wm. Randle, " "
GM—Aug. Andrews, " "
S of H—Mules. Track gauge 42 in.
S of M—5 Comp. air Machines.
PP—1 Water tube boiler, total 125 H. P., 1 Compressor, 1 pump.
EMP—60. Last fiscal year output 57,860 tons. Sales agent, W. L. Miller, St. Louis, Mo.
(Old information.)

ELDORADO COAL & MINING CO.
No. 1 Mine; Shaft; No. 5 Seam, 56 to 66 in. thick.
PO—Eldorado. Ill.; SP—Same; CTY—Saline; RR—C. C. C. & St. L.
PR—George L. Land......Ridgway, Ill.
TR—C. H. Burnett.......Eldorado, Ill.
GM—F. S. Seagrave, " "
GS—F. S. Seagrave, " "
PA—F. S. Seagrave, " "
EM—A. L. Voight. " "
EE—Herman Vaught, " "
MS—Chas. A. Gilmour, " "
S of H—3 elec. loco. and mules. Track gauge 42 ins.
S of M—12 Elec. mach an dhand.
PP—5 return tubular boilers, total 750 H. P., 2 gen. units, 275 volts D. C., 1 pump.
EMP—315. Last fiscal year output 350,000 tons.
Sales Agent, F. D. Kilmer, Old Colony Bldg., Chicago, Ill.

ELLY COAL COMPANY
Shaft Mine; No. 6 Seam; 84 to 96 in. thick.
PO—Girard, Ill.; SP—Farmersville; CTY—Macoupin; RR—Ill. Central.
PR—Gerog Hirsch, Gera, (Reuss) Germany.
VP—Ignaz Petschek,...........Austria
SECY—Henry D. Hamilton, Girard, Ill.
Asst. SECY—E. B. Young. Gera, (Reuss) Germany.
S of H—Mules.
Note—Formerly Farmersville Coal Mining Co.

FAIRBURY COAL CO.
West Mine; Shaft; No. 6 Seam, 55 in. thick.
PO—Fairbury, Ill.; SP—Same; CTY—Livingston; RR—T. P. & W.

PR—Wm. Morris........Fairbury, Ill.
TR—M. A. Morris, " "
GS—Wm. Morris..........Fairbury, Ill.
PA—M. A. Morris, " "
EM—Chas. Carter, " "
S of H—Mules.
S of M—Hand.
PP—3 water tube boilers, 1 pump.
EMP—45.

FAIRMOUNT COAL CO.
Fairmount Mine; Shaft; No. 7 Seam, 66 in. thick.
PO—Fairmount, Ill.; SP—Same CTY—Vermillion; RR—C. & E. I., Wab.
PR—Wm. Wood.........Fairmount, Ill.
GM—Wm. Wood, " "
PA—Wm. Wood, " "
MS—Henry Wood, " "
CE—Walter Cerjack, " "
MM—Walter Cerjack, " "
S of H—Mules and 1 comp. air loco. Track gauge 36 in.
S of M—Hand.
PP—3 boilers, total 400 H. P., 1 pump.

FARMERSVILLE COAL MNG. CO.
See Elly Coal Co.

FISCHER FUEL CO.
Mine leased to Northern Coal Co.

FRANKLIN COAL & COKE CO.
PR—J. L. Mitchell, ...Royalton, Ill.
MM—A. E. Giles, " "
EE—A. E. Giles, " "
PA—A. M. Pfisterer, " "
TR—C. Newton, ... Chicago, Ill.
SCO—Franklin Supply Co.,
SM—J. R. Hudelson......Royalton, Ill.
Sales agent, Bickett Coal & Coke Co., Chicago, Ill.

Mitchell Nos. 1 and 2 Mines, Shafts, No. 6 Seam, 10 to 11 ft. thick.
PO—Royalton, Ill. SP—Same. CTY—Franklin; RR—C. B. & Q. St. L. I. M. & S., and I. C.
MS—A. E. Giles........Royalton, Ill.
S of H—Mules, rope, and 8 elec. locos. Track gauge 42 in.
S of M—Hand and 20 elec. mach.
PP—3 Erie City, 1 Franklin water tube and 2 Galesburg return tubular boilers, total 1,200 H. P., 3 gen. units, 250 volts D. C., 1 pump.
EMP—590. Last fiscal year output 525,972 tons.

FULLERTON COAL CO.
General Office, Belleville, Ill.
Fullerton Mine, Shaft, No. 6 Seam, 6 to 7 ft. thick.
PO—Belleville, Ill. CTY—St. Clair. RR—L. &N.
PR—Jos. Randle, ... Belleville, Ill.
GM—Jos. Randle, " "
GS—Jas. Randle, " "
PA—Oswald Bollman, " "
TR—Oswald Bollman, " "
MS—Henry Deans, " "
S of H—Mules. Track gauge 2 ft.
S of M—Hand.
PP—2 Return tubular boilers, total 180 H.P., 1 generating unit, 1 pump.
EMP—42. Last fiscal year output 10,607 tons.

G. J. COAL CO.
No. 1 Mine.
PO—Seneca, Ill SP—Same. CTY—La Salle. No report.

GALLATIN COAL & COKE CO.
Equality Mine, Shaft, No. 5 Seam, 4¾ to 5½ ft. thick.
PO—Equality, Ill. SP—Same. CTY—Gallatin. RR—L. &N.
PR—Ben. W. Robinson, Equality, Ill.
TR—J. E. Cox, ...Evansville, Ind.
GM—Ben W. Robinson, Equality. Ill.
MM—O. Sisk, " "
MS—Jno. B. Smith, " "
S of H—Mules and electric. Track gauge 40 in.
S of M—Comp. air machines.
PP—4 Return tubular boilers, total 500 H.P., 3 pumps. Installing entirely new equipment, including modern steel tipple; will equip with electric haulage and mining machines.
(Old information.)

GARTSIDE COAL CO.
General Office, St. Louis, Mo.
Gartside No. 4, Shaft, No. 2 Seam, 4 to 7 ft. thick.
PO—Murphysboro, Ill. SP—Same. CTY—Jackson. RR—Mobile & Ohio.
PR—Robert A. Niggeman..St. Louis, Mo.
TR—Robert A. Niggeman, " "
Secy—Wm. J. Niggeman, " "
S of H—Mules. Track gauge 32 in.
S of M—Hand and 7 air compressors.
PP—7 return tubular boilers, 2 air compressors, 2 pumps.
EMP—110. Last fiscal year output 60,000 tons.

GENUINE NORRIS COAL MINING CO.
PO—Norris, Ill.; SP—Same CTY—Fulton; RR—C. B. & Q.
PR—A. E. Whitehead......Canton, Ill.
TR—A. E. Whitehead " "
MS—Jos. Quigley, ...Norris, Ill.
EM—Jos. Quigley, " "
Note—Development work has been suspended since March 27, 1915. Will resume operation in Aug., 1916.

GERMAN COAL CO.
Slope Mine, No. 5 Seam, 4½ ft. thick.
PO—Mapleton, Ill. SP—Hollis, Ill. CTY—Peoria. RR—T. P. &W.
GM—Charles Leitner....Mapleton, Ill.
PA—Charles Leitner, " "
EM—T.H. Leitner, " "
MS—Wm. Williams, .. Pekin, "
S of H—Mules and rope.
S of M—Elec. machines.
PP—2 boilers, total 120 H.P. gen. unit, 250 volts D.C.
EMP—20. Last fiscal year output 15,214 tons.
(Old information.)

GOLDEN RULE COAL CO.
Shaft Mine, No. 6 Seam, 6 ft. 10 in. thick.
PO—Lenzburg, Ill. SP—Same. CTY—St. Clair.
S of H—Mules.
S of M—Hand.

GRANGER COAL CO.
Bald Eagle Mine; Shaft; Anti-Cline Seam; 72 to 96 in. thick.
PO—Craig, Ill.; SP—Winkle, Ill.; CTY—Perry; RR—Ill. Cent.
PR—A. G. Graham..........Craig, Ill.
TR—A. G. Graham, " "
GM—A. G. Graham, " "
PA—A. G. Graham, " "
MS—Philip Macke, " "
EE—L. R. Boswell, " "
SCO—Graham Mercantile Co., Craig, Ill.
S of H—Mules.
S of M—Hand.
PP—2 John Rohan return tubular boilers, total 300 H. P., 1 pump.
EMP—100. Last fiscal year output 101,773 tons. Sales agency, Crown Coal Co., St. Louis, Mo.

GREENWOOD COAL CO.
Edinburg, Ill. No report.

GROOM COAL CO.
General Office, Belleville, Ill.
Richland Mine; Shaft; Bituminous No. 6 Seam; 72 to 120 in. thick.
PO—Belleville, Ill.; SP—Same; CTY—St. Clair; RR—I. C.
PR—John Groom........Belleville, Ill.
GM—John Groom, " "
GS—John Groom, " "
PA—John Groom, " "
MS—John Groom, " "
MM—Wm. Groom, " "
TR—Mrs. Emma Groom, " "
S of H—1 gasoline loco.
S of M—Hand.
PP—2 water tube boilers, total 100 H. P., 3 engines, 1 pump.
EMP—35. Last fiscal year output 11,500 tons.

HAFER WASHED COAL CO.
General Office, Chicago, Ill.
Hafer Mine No. 3; Shaft; No. 7 Seam, 7 to 9 ft. thick. Operate washery.
PO—Carterville, Ill. SP—Herrin. CTY—Williamson. RR—I. C. &St. L., I. M. &S., Herrin Southern Branch.
GM—M. J. Manermann...Chicago, Ill.
PA—M. J. Manermann, " "
MS—J. McGonagil.....Carterville, Ill.
GS—John McGonagil, " "
AM—Sherman Moore, " "
EM—Ralph Rolo......Murphysboro, Ill.
MM—S. L. Moore......Carterville, Ill.
S of H—Mules and 1 gasoline loco. Track gauge 36 in.
S of M—Hand.
PP—4 return tubular boilers, total 350 H. P., 5 pumps.
EMP—301. Last fiscal year output 208,672 tons.

HAKES-LYON COAL CO.
Rutland, Ill. No report.

HARRISBURG BIG MUDDY COAL CO.
Mines Nos. 12 & 14; Shaft; No. 5 Seam; 66 to 84 in. thick.
PO—Harrisburg, Ill; SP—Same; CTY—Saline; RR—Big Four;
PR—T. J. O'Gara,........Chicago, Ill.
TR—Thos. S. Jones. " "
GS—C. J. Horrigan, ..Harrisburg, Ill.
PA—Edw. Brennan, " "
MS—Wm. Evans, " "
CE—John Howell, " "
EM—R. D. Brown, " "
MM—C. W. Dixon, " "
EE—Horace Rawlins, " "
SM—E. Brenan, " "
S of H—Mules and 2 elec. locos. Track gauge 40 ins.
S of M—22 elec. machs.
PP—9 Return tubular boilers, total 1350 H. P., 2 gen. units, 250 volts D. C., 2 pumps
EMP—Mine No. 12—300. Last fiscal year output 24,000 tons
EMP—Mine No. 14—370. Last fiscal year output, 201,000 tons.

HARRISBURG COLLIERIES CO.
GM—F. D. Kilmer, 1155 Old Colony Bldg., Chicago, Ill.
No report.

HARRISBURG-SALINE COLLIERIES CO.
General Office, Marquette Bldg., Chicago, Illinois.
No. 15 Mine; Shaft; No. 5 Seam; 60 to 72 in. thick.
PO—Harrisburg, Ill; SP—Same; CTY—Saline; RR—Big Four.
PR—T. J. O'Gara,........Chicago, Ill.
TR—T. S. Jones. " "
GS—C. J. Horrigan,...Harrisburg, Ill.
MS—Wm. Evans, " "
PA—Edw. Brenan, " "
EM—P. D. Brown, " "
MM—C. W. Dixon, " "
EE—Horace Rawlins, " "
S of H—Mules and 2 elec. locos.
S of M—12 elec. machs.
PP—4 Return tubular boilers, total 600 H. P., 1 gen. unit, 250 volts D. C., 2 pumps.
EMP—400 Last fiscal year output, 315,000 tons.

HART-WILLIAMS COAL CO.
Hart-Williams No. 1, Shaft, No. 6 Seam, 9 to 12 ft. thick.
PO—Benton, Ill. SP—Same. CTY—Franklin. RR—Illinois Central, C. &E.I. and St. L.I.M.&S.
PR—Walter W. Williams, Benton, Ill.
TR—W. H. Hart, " "
GM—Geo. A. Powers....Benton, Ill.
PA—Geo. A. Powers, " "
GS—Geo. A. Powers, " "
MS—Lacey Peyton, " "
EM—J. L. Oliver, " "
S of H—Mules and 3 elec. loco.; gauge 42 in.
S of M—18 Elec. mining machines.
PP—7 Water tube, Kewanee, 18x72 boilers, total 1050 H. P., 2 gen. units 250 volts, D. C., 1 pump.
EMP—15.
In hands of L. W. Brand, receiver.

HENDERSON-WALLACE COAL COMPANY
Henderson-Wallace Mine; Shaft; 72 to 96 in. thick.
PO—Marion, Ill.; SP—Same; CTY—Williamson; RR—M. & E.
PR—Geo. A. Wallace......Marion, Ill.
GM—Geo. A. Wallace, " "
PA—Geo. A. Wallace, " "
CE—D. N. Baker, " "
MM—D. M. Norman, " "
S of M—1 elec. mach.

HICKORY HILL COAL COMPANY.
General Office, 1206 Edison Bldg., Chicago, Ill.
Hickory Hill Mine, Slope; No. 5 Seam, 56 to 66 ins. thick.
PO—Junction, Ill.; SP—Dempsey, Ill.; CTY—Gallatin; RR— L. & N., Shawneetown Branch.
PR—W. R. Tapper........Chicago, Ill.
TR—W. R. Tapper, " "
GM—W. S. Walker,
1114 Syndicate Bldg., St. Louis, Mo.
PA—W. S. Walker,
1114 Syndicate Bldg., St. Louis, Mo.
GS—Ruben Williams, ...Harrisburg, Ill.
MS—Thomas Williams,....Equality, Ill.
EE—Walker Renfro, " "
S of H—Rope and mules; track gauge 42 in.
S of M—3 Elec. machines.
PP—2 water tube boilers, total 250 H. P., 150 volts D. C., 1 pump.
EMP—70. Last fiscal year output 51,000 tons.

HIGHLAND COAL CO.
Highland Mine, Shaft: Seam: 6 to 9 ft. thick.
PO—Belleville, Ill.; SP—Same; CTY—St. Clair; RR—L. & N.
PR—Christ Neff.......Belleville, Ill.
TR—A. Crosspitsch, " "
MS—A. Crosspitsch, " "
EM—Wm. Stack, " "
S of H—Mules, track gauge 22 in.
S of M—Hand.
EMP—20 to 25.

HILLSBORO COAL COMPANY.
Hillsboro Mine; Shaft; No. 6 Seam; 7½ to 8 ft. thick.
PO—Hillsboro, Ill.; SP—Same; CTY—Montgomery; RR—C. C. C. St. L. Ry., C. & E. I. Ry.
PR—Amos Miller......Hillsboro, Ill.
TR—Rice Miller, " "
GM—Rice Miller, " "
PA—Rice Miller, " "
MS—W. H. Smith, " "
S of H—3 Elec. loco.; track gauge 26 in.
S of M—10 Electric machines.
PP—4 Boilers total 600 H. P., 2 gen. units, 250 volts, D. C.; 2 pumps delivering water to the surface.
EMP—250.

ILLINOIS FUEL CO., THE
Mine No. 4, Shaft, No. 6 Seam, 6 to 6½ ft. thick.
PO—Sparta, Ill. SP—Same. CTY—Randolph. RR—Illinois Southern, and Mobile & Ohio.
PR—W. S. Ingraham, ..Bristol, Conn.
TR—W. V. Stockton........Sparta, Ill.
GM—W. V. Stockton, " "
PA—W. V. Stockton, " "
GS—John Winterbottom " "
SECY—J. C. Newman, " "
MS—A. F. Kramer, " "
EM—C. E. Morrow, " "
EE—Wick Barbee, " "
S of H—Mules and 1 elec. loco. Track gauge 42 in.
S of M—7 Elec. machines.
PP—3 return tubular boilers, total 500 H. P., 2 gen. units, 250 volts D. C., 2 pumps.
EMP—190. Coke ovens, 102 Bee Hive. Last fiscal year output 207,256 tons.

ILLINOIS HOCKING WASHED COAL CO.
Burned out May, 1913. Closed since.

ILLINOIS VALLEY COAL CO.
Nos. 1, 2 and 3 Mines, Drifts, No. 7 Seam 3 ft. 10 in. thick.
PO—Sparland, Ill., SP—Same. CTY—Marshall. RR—C.R.I.&P.
GM—O. F. Scholz, .. Sparland, Ill.
PA—O. F. Scholz, " "
MS—Robert Ray, " "
EM—C. H. Dunn,........Peoria, Ill.
S of H—Mules.
S of M—Elec. mach. and hand.
PP—1 Gen unit, 1 100 K.W., 250 volts D.C.
EMP—200. Last fiscal year output (1-2) 54,268 tons. .. ...
Note—Not operating at present.

ILLINOIS THIRD VEIN COAL CO.
No. 1 Mine, Shaft; No. 2 Seam, 3½ ft. thick.
PO—Ladd, Ill. SP—Same. CTY—Bureau. RR—C.B.&Q., C.M.&S. T.L.P., C.&N.W., C.I.&S.
PR—George B. Taylor.........Erie, Pa.
TR—C. F. Sherard..........Ladd, Ill.
GM—C. F. Sherard, " "
MS—F. D. Chadwick, " "
S of H—Mules.
S of M—Hand.
PP—6 Return tubular boilers, total 900 H. P., 1 gen. unit 250 vols D. C., 3 pumps. Purchase power.
EMP—600. Last fiscal year output 211,016.14 tons.

ILLINOIS ZINC CO.
PR—Thos. F. Noon..........Peru, Ill.
PA—E. H. Wolf, " "
CE—J. A. Ede, " "

No. 1 Mine; Slope; No. 2 Seam; 38 to 42 in. thick.
PO—Peru, Ill.; SP—Deer Park; CTY—La Salle; RR—C. B. & Q.
MS—J. A. Ede...........Peru, Ill.
S of H—Mules.
S of M—Hand.
PP—2 return tubular boilers, total 200 H. P., 2 gen. units.
EMP—105. Last fiscal year output 64,755 tons.

No. 3 Mine; Shaft; No. 2 Seam; 38 to 42 in. thick.
PO—Peru, Ill.; SP—Same; CTY—La Salle; RR—C. R. I & P.
MS—J. A. Ede.............Peru, Ill.
S of H—Mules.
S of M—Hand.
PP—2 boilers, total 185 H. P., 2 gen. units.
EMP—125. Last fiscal year output 54,710 tons.

INTERNATIONAL COAL MINING CO.
General Office, St. Louis, Mo.
Carbon Mine, Shaft, No. 6 Seam; 84 to 120 in. thick.
PO—O'Fallon, Ill. SP—Same. CTY—St. Clair. RR—B.&O. S.W.
PR—J. Edw. Yoch, ..St. Louis, Mo.
GM—J. Edw. Yoch, " "
PA—Jacob B. Yoch.......O'Fallon, Ill.
TR—Jacob B. Yoch, " "
GS—Thomas Grant, ... O'Fallon, Ill
MS—Thomas Grant, " "
EM—Geo. A. Fischer, " "
SM—T. Dougherty, " "
SCO—O'Fallon Mercantile Co., O'Fallon, Ill.
S of H—1 Elec. loco. and mules. Track gauge 30 in.
S of M—4 elec. mach.
PP—4 Return tubular boilers, total 600 H. P. 250 volts D. C., 1 pump.
EMP—100. Last fiscal year output 113,300 tons. Sales agent, E. Willhite, O'Fallon, Ill.

JACKSON COAL CO.
General Office, Connellsville, Pa.
Jackson Mine; Shaft; Herrin No. 6 Seam, 102 to 144 in. thick.
PO—Hallidayboro, Ill.; SP—Same; CTY—Jackson; RR—Ill. Central
PR—H. C. Hoffman...Connellsville, Pa.
TR—E. R. Floto, " "
GS—E. F. Miller....Hallidaysboro, Ill.
PA—E. F. Miller, " "
MS—J. C. Thompson, " "
EM—J. C. Thompson, " "
MM—E. H. Stewart, " "
SCO—Muddy Valley Supply Co., Buyer, E. Scott, Halidaysboro, Ill.

(Continued on Next Page.)

Jackson Coal Co.—Cont.
S of H—Mules, rope and 2 storage battery loco. Track gauge 42 in.
PP—14 Erie City return tubular boilers, total 1500 H. P., 2 gen. units, 250 volts D. C., 2 pumps, 1 air comp.
EMP—401. Last fiscal year output 356,000 tons.

JOHNSON VALLEY COAL CO.
Johnson Valley Mine, Shaft, No. 5 Seam 5½ ft. thick.
PO—Fancy Prairie, Ill. SP—Middletown, Ill. CTY—Menard. RR — C.&A., Peoria Division.
PR—Jerry Johnson, Fancy Prairie, Ill.
EM—Jerry Johnson, " " "
TR—C.C. Johnson, " " "
GM—H.C. Johnson, " " "
PA—H.C. Johnson, " " "
MS—H.C. Johnson, " " "
S of H—Mules. Track gauge, 26 in.
S of M—Hand, 1 Puncher, 1 Comp. air mining machine.
PP—2 water tube boilers, total 120 H.P., 1 air compressor, 1 pump, delivering water to surface.
EMP—10. Last fiscal year output 5,650 tons.

JOHNSTON CITY COAL COMPANY.
General Office, Old Colony Bldg., Chicago, Ill.
Mine No. 1, Shaft, No. 6 Seam, 7½ to 10½ ft. thick.
PO—Johnston City, Ill. SP—Same, CTY—Williamson. RR—C.&E.I., Mo. P. and Ill. Cent.
PR—J. Duggan, ... Peoria, Ill.
TR—P.H. Holland, .. Chicago, "
GM—P.H. Holland, " "
PA—P.H. Holland, " "
EE—Paul Cassidy, Johnston City, Ill.
S of H—Mules and 6 elec. loco. Track gauge 42 in.
S of M—Hand and 27 elec. mach.
PP—8 return tubular boilers, total 1,250 H. P., 2 gen. units, 250 volts, D.C.
EMP—500. Last fiscal year output 604,000 tons. Sales Agent, P.H. Holland, Chicago, Ill.

JONES & ADAMS COAL CO. (THE)
General Office, 1604 Steger Bldg., Chicago, Ill.
Peerless Mine, Shaft, No. 5 Seam, 5 ft. 8 in. thick.
PO—Springfield, Ill. SP—Same. CTY—Sangamon. RR—Springfield Terminal Ry.
PR—H. C. Adams,........Chicago, Ill
TR—D.W. Heath, " "
PA—A.L. Ronan, " "
CE—F.A. Ray, ... Columbus, O.
EM—F. Payne. .... Springfield, Ill.
MM—James Shipps , " "
EE—James Shipps, " "
MS—F.J. Devlin. . Springfield, Ill.
S of H—Mules and 3 elec. loco. Track gauge 42 in.
S of M—Solid shooting.
PP—5 return tubular boilers, total 750 H.P. 250 volts D.C., 1 pump.
EMP—497. Annual output, 425,000 tons.

JONES BROS. COAL CO.
Eureka Nos. 1 and 2 Mines, Shaft, No. 6 Seam, 5½ to 7 ft. thick.
PO—Marissa, Ill. SP—Same. CTY — St. Clair. RR—I.C.
PR—Jonathan Jones, Sr.....Marissa, Ill.
TR—Jonathan Jones, Sr... " "
GM—Wm. Jones, " "
SM—Wm. Jones, " "
MS—Wm. Jones, " "
S of H—Mules and rope. Track gauge 32 and 36 in.
S of M—Hand.
PP—2 Return tubular boilers, total 100 H. P., 1 pump.
EMP—234. Last fiscal year output 186,734 tons.

KELLER, F. C.
PO—Chicago, Ill.
Receiver for Coal Properties of the C. & E. I. R. R. Mines formally operated by Peabody Coal Co.

KERENS-DONNEWALD COAL CO.
General Office, 12th St. and Lucas Ave., St. Louis, Mo.
K. D. Mine, Shaft, No. 6 Seam 5 to 7½ ft. thick
PO—Worden, Ill. SP—Same. CTY — Madison. RR—L.&M., Wabash I. T.S.
GM—J. A. Jefferis......St. Louis, Mo.
PA—J. A. Jefferis, " "
MS—John Considine, .. Worden, Ill.
CE—L.B. Martin, ... Decatur, "
EM—M.D. Connard, " "
MM—Jos. Piper, ... Worden, "
EE—Jos. Piper, " "
S of H—1 Westinghouse elec. loco. and mules. Track gauge 36 in.
S of M—7 Elec. machines.
PP—4 boilers, 7 gen. units, 250 volts D.C. 1 pump.
EMP—196. Last fiscal year output 144,049 tons. Sales agent, J. A. Jefferis, St. Louis, Mo.

KEYSTONE BIG MUDDY COAL & COKE CO.
Mine has been closed for two years.

KOLB COAL CO.
General Office, 305 Mermod-Jaccard Bldg., St. Louis, Mo.
PR—E. R. Hagist......Mascoutah, Ill.
TR—H. Hucke, " "
GS—O. J. Kling nfus, " "

No. 1 Mine; Shaft; No. 6 Seam; 72 to 86 in. thick.
PO—Mascoutah, Ill.; CTY—St. Clair; RR—L. & N.
MS—J. G. Mann.......Mascoutah, Ill.
S of H—2 gasoline loco.
PP—3 boilers.
EMP—85. Last fiscal year output 62,906 tons.

No. 2 Mine; Shaft; 72 to 84 in. thick.
PO—Mascoutah, Ill.; CTY— St. Clair; RR—L. & N.
S of H—2 gasoline locos.
S of M—Hand.
PP—4 boilers, 2 pumps.
EMP—150. Last fiscal year output 131,117 tons.

Fairbanks Mine; Shaft; No. 6 Seam; 62 to 74 in. thick.
PO—New Athens, Ill.; SP—Same; CTY—St. Clair; RR—Ill. Central.
MS—Theo. Legendre, New Athens, Ill.
S of H—Mules and 2 gasoline loco.
PP—2 boilers, 2 pumps.
EMP—100. Last fiscal year output 86,839 tons.

KUHN COALERY CO.
Bois Mine; Shaft; No. 6 Seam; 72 to 84 in. thick.
PO—Du Bois, Ill.; SP—Bois, Ill.; CTY—Washington; RR—Ill. Central.
GS—J. A. Kuhn.........Du Bois, Ill.
PA—J. A. Kuhn, " "
MS—Peter Keil, " "
SCO—Kuhn Coalery Company. Buyer, Mrs. A. Kuhn, Du Bois, Ill.
S of H—Mules. Track gauge 30 in.
S of M—Hand.
PP—2 O'Brien return tubular boilers.
EMP—55. Last fiscal year output 25,000 tons.
Note—Formerly known as Kuhn Coal Co.

LAKE ERIE COAL AND MINING CO.
Lake Erie Mine, Drift, Seam 4 ft. 4 in. thick.
PO—Peoria, Ill. SP—Peoria, Ill. CTY—Peoria. RR—L.E.&W.
PR—F.R. Carter, ... Peoria, Ill.
GM—Walter Boundy......E. Peoria, Ill.
PA—F.R. Carter, " "
MS—T. Wantling, " "
S of H—Rope and mules. Track gauge 33 in.
S of M—Hand.
PP—1 pump. Purchase power.
Last fiscal year output 10,500 tons.

LANCASTER LANDING & TRANS. CO.
Lancaster Landing No. 1, Drift, Bituminous No. 5 Seam, 4½ ft. thick.
PO—Kingston Mines, Ill.; SP—Same; CTY—Peoria, Ill.; RR—Illinois Central.
PR—S.R. Jefford, Kingston Mines, Ill.
TR—John Lanan, " " "
GM—L.E. Robinson, " " "
MS—L.E. Robinson, " " "
PA—J. C. Firth, " " "
EM—D. S. Buck..........McLean, Ill.
S of H—Mules. Track gauge 35 in.
S of M—Hand.
PP—1 pump.
EMP—45. Last fiscal year output 22,475 tons.

LA SALLE COUNTY CARBOW CO.
General Office, La Salle, Ill.
PR—Richard P. Joy....Detroit, Mich.
TR—F. W. Dennis, " "
GM—H. S. Hazen......La Salle, Ill.
GS—C. C. Swift, " "
PA—C. C. Swift.........La Salle, Ill.
EM—Fred Reinz.........Streator, Ill.
EE—L. T. Brannon.. .. La Salle, Ill.
MM—M. Brumback, " "
SCO—Union Stores Co., Buyer, T. E. Flanagan, La Salle, Ill.
Sales Agent, L. W. Smith, La Salle, Ill.

No. 1 Mine; Shaft; No. 2 Seam, 42 in. thick.
PO—La Salle, Ill., SP—Same; CTY—La Salle; RR—I. C., C. B. & Q.
Mine MGR—Adam Currie..La Salle, Ill.
S of H—2 Elec. loco. and mules; track gauge 40¾ in.
S of M—Hand.
PP—2 Erie, 2 Kewanee, 1 Frost return tubular boilers total 625 H. P., 3 phase, 60 cycles, 1 pump. Purchase power.
EMP—320. Last fiscal year output 158,709 tons.

No. 5 Mine; Shaft; No. 2 Seam, 42 in. thick.
PO—Cedar Point, Ill.; SP—Same; CTY—La Salle; RR—C. M. & St. P.
Mine MGR—Owen White, Cedar Point, Ill.
S of H—Mules; track gauge 42 in.
S of M—Hand.
PP—6 Erie City, return tubular boilers total 750 H. P., 2 gen. units 250 volts D. C., 2 pumps.
EMP—390. Last fiscal year output 163,200 tons.

La Salle Mine; Shaft; No. 2 Seam; 42 in. thick.
PO—La Salle, Ill.; SP—Same; CTY—La Salle; RR—C. R. I. & P., & I. C.
Mine MGR—John Millhouse, La Salle, Ill.
S of H—2 elec. locos. and mules.
S of M—1 elec. mach.
PP—4 return tubular boilers, total 400 H. P., 3 phase, 60 cycles. Purchase power.
EMP—215. Last fiscal year output 43,410 tons.

Union Mine; Shaft; No. 2 Seam; 42 in. thick.
PO—La Salle, Ill.; SP—Same; CTY—La Salle; RR—C. R. I. & P.
Mine MGR—Harvey Knowles, La Salle, Ill.
SM—George Cummings, " "
S of H—Mules.
PP—1 pump, 3 phase, 60 cycles. Purchase power.
EMP—235. Last fiscal year output 117,647 tons.

LINCOLN MINING CO.
Lincoln Mine, Shaft, No. 5 Seam, 5½ ft. thick.
PO—Lincoln, Ill. SP—Same. CTY—Logan. RR—Chicago & Alton, Ill. Central.
PR—Walter Puterbough.....Lincoln, Ill.
TR—D. H. Harts, Jr. " "
GM—B. H. Armstrong, " "
PA—B. H. Armstrong, " "
MS—Geo. Evans, " "
MM—A. Swythmier, " "
S of H—Mules and rope.
S of M—Hand.
PP—2 pumps, 7 return tubular boilers.
Sales Agent, B. H. Armstrong, Lincoln, Ill.

LATHMAN COAL & MINING COMPANY
North Mine; Shaft; No. 5 Seam, 60 in. thick.
PO—Lincoln, Ill.; SP—Same; CTY—Logan; RR—I. C. and C. & A.
PR—E. W. Bates,........Lincoln, Ill.
TR—E. C. Lutz " "
GM—Wm. Bresnan, " "
GS—Wm. Bresnan, " "
PA—Matt Brennan, " "
MS—Wm. Bresnan " "
EM—Wm. Bresnan " "
CE—Wm. Bresnan, " "
EE—C. Moran " "
MM—Joseph Quinn, " "
SCO—Latham Coal & Mining Co. Buyer, Matt Brennan.
S of H—Mules and 4 elec. loco. Track gauge 42 in.
S of M—Hand.
PP—4 Springfield and 2 Kewanee return tubular boilers, 750 H. P., 7 gen. units, 250 volts D. C., 4 pumps.
EMP—320. Sales agency, Latham Coal & Mining Co.
Note—Successors to Latham Mining Co.

LOGAN COAL CO.
General Office, Peoria, Ill.
Logan Mine, Shaft, No. 5 Seam 4 ft. thick.
PO—Hanna City, Ill. SP—Same. CTY Peoria. RR—M.&St.L.
PR—W.R. Coleman, ... Peoria, Ill.
GS—J.M. Tyson, " "
PA—J.M.Tyson..........Peoria, Ill.
EE—R. U. Tyson, " "
S of H—Mules and 3 elec. locomotives. Track gauge 3 ft.
S of M—11 Elec. machines.
PP—2 return tubular boilers, motor generator, 250 volts D.C., 1 pump. Power purchased.
EMP—175. Last fiscal year output 92,000 tons.

LOGAN, JOHN A., COAL CO.
Shaft Mine; No. 7 Seam, 60 to 90 in. thick.
PO—Logan, Ill.; SP—Logan, Ill.; CTY—Franklin; RR—I. C. and C. B. & Q.
PR—W. J. Carney........Chicago, Ill.
GM—W. J. Carney, " "
PA—W. J. Carney, " "
TR—J. J. Wright, " "
MS—W. G. Wilson......Hanaford, Ill.
EM—Wm. Oliver..........Benton, Ill.
S of H—2 Elec. loco.; track gauge, 42 in.
S of M—20 elec. mach.
PP—4 Boilers, gen. unit, 250 volts D. C.

LOVINGTON COAL MINING CO. .... ..
General Office, 2009 Sufferin Bldg., Decatur, Ill.
No. 1 Mine; Shaft; No. 6 Seam, 102 to 114 in. thick.
PO—Lovington, Ill. SP—Same; CTY—Moultrie; RR—Wabash and Vandalia.
PR—J. M. Duncan........Decatur, Ill
TR—J. S. Crugar, " "
GM—J. S. Crugar, " "
PA—J. S. Crugar, " "
GS—H. C. Newcomb....Lovingon, Ill.
MS—H. C. Newcomb, " "
EM—W. J. Day...........Bement, "
S of H—Mules and 1 elec. loco; track gauge 42 in.
S of M—Hand.
PP—4 Atlas, 1 Springfield Marine, 1 Casey-Hedges tubular boilers, total 975 H. P., 1 gen. unit, 250 volts D. C., 1 compressor, 5 pumps.
EMP—200. Last fiscal year output, 167,661 tons.
Sales Agents, Edwards & Bradford Lbr. Co., Chicago, Ill.

LUMAGHI COAL CO.
General Office, Equitable bldg., St. Louis, Mo.
PR—L.F. Lumaghi, .. St. Louis, Mo.
GS—L.F. Lumaghi, " "
TR—J.D. Lumaghi, " "
GM—J.D. Lumaghi, " "
PA—A. C. Powell, " "
EM—A.C. Powell, " "
MM—J. Rapp, ... Collinsville, Ill.
EE—J. Rapp, " "

Mine No. 2, Shaft Mine, No. 7 Seam, 5½ to 10 ft. thick.
PO—Collinsville, Ill. SP—Same. CTY—Madison. RR—Vandalia.
MS—W. T. Scully, Collinsville, Ill.
S of H—4 elec. motors and mules. Track gauge 42¼ in.
S of M—25 elec. machines.
PP—6 return tubular Lyons & O'Brien, boilers, total 1250 H.P., 1 gen. unit, 250 D. C., 1 pump, delivering water to surface. Also purchase power.
EMP—475. Annual output, 350,000 tons.

Mine No. 3, Shaft Mine, No. 7 Seam, 5½ to 10 ft. thick.
PO—Collinsville, Ill. SP—Same. CTY—Madison. RR—Vandalia.
MS—Jas. McKernon, Collinsville, Ill.
S of H—Mules. Track gauge 38½ in.
S of M—18 Comp. air mach.
PP—4 Return tubular O'Brien & Wangler boilers, total 600 H. P., 1 comp., 1 pump delivering water to surface, also purchase power.
EMP—260. Annual output , 100,000 tons.

McLEAN COUNTY COAL CO.
McLean Mine, Shaft No. 2 Seam 3 ft. 8 in. to 4 ft. thick.
PO—Bloomington, Ill., SP—Same, CTY—McLean. RR—C.&A., Big 4 & L. E.&W. RR.
PR—Julia G. Scott....Bloomington, Ill.
TR—L.M.Graham, " "
PA—L.M. Graham, " "
GM—T S. Bunn, " "
MS—Jo. Smith, " "
S of H—Rope and mules; track gauge 34½ in.
in.
S of M—Hand.
PP—4 Wicks vertical Water tube boilers, total 800 H.P., 1 pump.
EMP—180. Last fiscal year output 73,000 tons.

McNEILL COAL COMPANY, THE
Stripping, Top Seam, 3 to 9 ft. thick.
PO—Carterville, Ill.; SP—Same; CTY—Williamson RR—Coal Belt.
PR—J.S. McNeil, .. Carterville, Ill.
TR—J.S. McNeil, " "
S of H—Mules. Track gauge 30 in.
S of M—Hand.
EMP—6.

MADISON COAL CORPORATION.
General Office, 1111 Karpen Bldg., Chicago, Ill.
PR—A. J. Moorshead......Chicago, Ill.
GM—A.J. Moorshead, " "
TR—F.H. Wolfarth, " "
PA—J. G. Skidmore.......Chicago, Ill.
MS—A. W. Miller.......Dewmaine, Ill.
EM—G.E.Lyman, Glen Carbon, "
MM—James Baudino....Dewmaine, Ill.
EE—A H. Sandner, " "
SCO—John Lyons Store. Buyer, I. L. Clark, Dewmaine, Ill.

Madison Nos. 8 and 9 Mines, Shafts, No. 6 Seam, 90 to 132 in. thick.
PO—(No. 8 Mine) Dewmaine, Ill.; SP—Carterville, Ill.; PO—(No. 9 Mine) Cambria, Ill.; SP—Same; CTY—Williamson; RR—Illinois Central, St Louis Div.
MS—A.W. Miller, .. Dewmaine, Ill.
S of H—Mules and 6 elec. locos. Track gauge 42 and 44 in.
S of M—Hand and 4 elec. mach.
PP—12 Brownell water tube boilers, 4 gen. units, 500 volts D. C., 6 pumps.
EMP—850. Last fiscal year output 894,945 tons.

Madison No. 2 Mine, Shaft, No. 6 Seam, 5 to 6½ ft. thick.
PO—Glen Carbon, Ill. SP—Same. CTY—Madison. RR—Ill. Cent.
MS—A. Daenzer.....Glen Carbon, Ill.
S of H—Mules and 3 elec. loco. Track gauge 24 in.
S of M—32 Comp. air mach.
PP—7 return tubular boilers, 1 generating unit, 250 volts, A.C., 2 air compressors.

EMP—386. Last fiscal year output 322,291 tons.

Madison No. 6 Mine, Shaft, No. 6 Seam, 8 ft thick.
PO—Divernon, Ill. **SP**—Same. **CTY**—Sangamon. **RR**—Ill. Cent., Springfield Div.
S of H—Mules and 2 elec. locomotives. Track gauge 42 in.
S of M—14 Elec. Machines.
PP—6 return tubular boilers, total 720 H.P., 7 generating units, 250 volts, D.C., 1 pump.
EMP—540. Last fiscal year output 403,284 tons.

MAJESTIC COAL & COKE CO.

General Office, Chicago, Ill.
Majestic Mine; Shaft; No. 6 Seam, 90 to 144 in. thick.
PO—DuQuoin, Ill. **SP**—Same. **CTY**—Perry. **RR**—Ill. Central.
PR—R. F. Clinch,........Chicago, Ill.
TR—R. F. Clinch, " "
GM—E. C. Searls, ... DuQuoin, "
GS—F. S. Cousin, " "
PA—A. Lehn, " "
EM—H. W. Goodnon, " "
MM—J. Mayer, " "
EE—Geo. Thomas, " "
S of H—6 Elec. loco. and mules; track gauge 36 in.
S of M—16 Elec. mach.
PP—6 Water tube and 6 return tubular boilers, total 1050 H. P., 2 gen. units 250 volts D. C., and 1 pump.
EMP—600. Last fiscal year output 786,000 tons.

MANUFACTURERS COAL CO.

Manufacturers Mine, Shaft, Second Seam, 34 in. thick.
PO—Marseilles, Ill.; **SP**—Same, **CTY**—LaSalle; **RR**—C. R. I. & P.
PR—R. F. Knott......Marseilles, Ill.
TR—F. E. Smith, " "
GM—F. E. Smith, " "
PA—F. E. Smith, " "
MS—D. H. Cummings, " "
S of H—Mules; track gauge 24 and 36 in.
S of M—Hand.
PP—2 Return tubular boilers, total 180 H. P., 1 pump.
EMP—75.

MANUFACTURERS & CONSUMERS COAL CO.

Shaft Mine; No. 5 Seam, 4½ ft. thick.
PO—Decatur, Ill.; **SP**—Same; **CTY**—Macon; **RR**—I. C., Vandalia, Wab., C. H. & D.
GM—W. S. Ridgley......Decatur, Ill.
PA—W. S. Ridgley, " "
MS—Louis White, " "
S of H—Mules.
S of M—Hand.
PP—4 Boilers total 500 H. P.
EMP—215. Last fiscal year output 114,361 tons.

MAPLETON COAL CO.

Mapleton Mine.
PO—Mapleton, Ill.; **CTY**—Peoria.
No report.

MAPLEWOOD COAL CO.

Black Hawk Mine; Shaft; No. 5 Seam; 48 in. thick.
PO—Farmington, Ill.; **SP**—Same; **CTY**—Fulton; **RR**—M. & St. L.
PR—G. A. Ditewig......Peoria, Ill.
GM—G. A. Ditewig, " "
TR—Jas. F. McElwee, " "
GM—Wm. Spenny.....Farmington, Ill.
PA—W. C. Gill, " "
EE—Robert Kerr, " "
S of H—1 Elec. loco.
S of M—Hand.
PP—2 return tubular boilers, total 300 H. P., 3 gen. units, 250 volts D. C., 2 pumps.

MARION COUNTY COAL CO.

General Office, Centralia, Ill.
Glenridge Mine; Shaft; No. 6 Seam, 60 to 90 in. thick.
PO—Glenridge, Ill.; **SP**—Same; **CTY**—Marion; **RR**—I. C. C. B. & Q.
PR—F. Kohl..........Centralia, Ill.
TR—H. Kohl, " "
GM—E. E. Fyke, " "
GS—E. E. Fyke, " "
PA—E. E. Fyke, " "
EM—Lee Haskins, " "
EE—George Klein, " "
S of H—Mules and 3 elec. loco.; track gauge 36 in.
S of M—12 Elec. machines.
PP—1 Pump, 6 return tubular boilers, total 900 H. P., 2 gen. units, 250 volts, D. C.
EMP—425. Last fiscal year output 325,000 tons.

MATTHIESSEN & HEGELER ZINC CO.

Shaft Mine, No. 5 Seam; 3½ to 5 ft. thick.
PO—La Salle, Ill.; **SP**—Same; **CTY**—La Salle; **RR**—L. S. & B. C.
PR—Mary Hegeler Carus....LaSalle, Ill.
PA—Address the Company.
MS—Jos. Brennemann....La Salle, Ill.
S of H4 Elec. loco.; track gauge 41¼ in.
S of M—Hand.
PP—220 volts D C. from Central Station.
EMP—135. Last years output 158,940 tons.
Mine coal for their own use.

MIDDLE FORK MINING CO.

Middle Fork Mine; Shaft; No. 6 Seam; 84 to 120 in. thick.
PO—Benton, Ill.; **SP**—Same; **CTY**—Franklin; **RR**—I. C. and C. & E. I.
PR—J. M. Seymour........Benton, Ill.
GM—J. M. Seymour, " "
GS—J. M. Seymour, " "
PA—J. M. Seymour, " "
TR—R. R. Ward, " "
EM L. T. Putman, " "
CE—Allen & Garcia Co., Chicago, Ill.
S of H—Mules.
S of M—4 elec. mach.
PP—2 pump. Purchase power.
EMP—95. Last fiscal year output 20,000 tons. Sales agency, Edwards & Bradford Lumber Co., Fisher Bldg., Chicago, Ill.
(Mine still under development).

MILLER, HOWARD E.

Ruby Mine; Six Seam; 36 ins. to 84 ins. thick.
PO—Caseyville, Ill.; **SP**—Furman, Ill.; **CTY**—St. Clair; **RR**—B. & O. S. W.
GM—Howard E. Miller...Caseyville, Ill.
GS—Howard E. Miller " "
PA—Howard E. Miller " "
MS—Jos. G. Beynon " "
S of H—Mules. Track gauge 24 ins.
S of M—Hand.
PP—2 O'Brien return water tubular boilers, 200 H. P.
Successor Cluley-Miller Coal Co.

MINONK COAL CO.

PO—Minonk, Ill.
No report.

MISSION MINING CO.

Stripping Mine; No. 7 Seam, 68 to 72 in. thick.
PO—Danville, Ill.; **SP**—Same; **CTY**—Vermillion; **RR**—Big Four.
PR—W. G. Hartshorn....Danville, Ill.
GM—W. G. Hartshorn, " "
TR—John G. Hartshorn, " "
S of H—1 Steam loco. and rope.
S of M—Steam shovels.
PP—Power purchased.
EMP—75.
Successors to the Gray Coal Co.

MISSIONFIELD COAL CO.

PR—W. G. Hartshorn....Danville, Ill.
TR—J. G. Hartshorn, " "
GM—W. G. Hartshorn, " "
PA—E. H. Jobson, .. " "
EM—J. C. Anderson, " "
EE—Charles Arkett........Oakwood, Ill.
SCO—Hartshorn Bros., Buyer, J. G. Hartshorn.
Danville No. 2 Mine; Slope; No. 7 Seam, 5 ft. 10 in. to 6 ft. 4 in, thick.
PO—Danville, Ill.; **SP**—Oakwood, Ill. **CTY**—Vermilion; **RR**—Big Four.
MS—Geo. Anderson.......Danville, Ill.
S of H—Mules and 1 Elec. loco.; track gauge 36 in.
S of M—4 Elec. mach.
PP—2 Pumps. Buy power.
EMP..125. Last fiscal year output 100,000 tons.

No. 3 Mine, Slope, No. 7 Seam, 5 ft. 10 in. to 6 ft. 4 in. thick.
PO—Danville, Ill.; **SP**—Oakwood, Ill. **CTY**—Vermilion; **RR**—Big Four.
MS—Alex. Anderson
Oakwood, Ill., R. F. D. No. 3
S of H—Mules and 1 Elec. loco.; track gauge 36 in.
S of M—4 Elec. chain mach.
PP—Purchase power.
EMP—125. Last fiscal year output 100,000 tons.

MOFFAT COAL CO.

No. 1 Mine; Shaft; No. 6 Seam; 72 in. thick.
PO—Sparta, Ill.; **SP**—Same; **CTY**—Randolph; **RR**—M. & O.
PR—J. D. Moffat........Sparta, Ill.
TR—J. D. Moffat, " "
PA—J. D. Moffat, " "
GS—R. E. Moffat, " "
MS—R. E. Moffat, " "
EM—Robert Deans, " "
S of H—Mules.
S of M—Hand.
PP—4 water tube boilers, 2 pumps, and 1 air comp.
EMP—184. Last fiscal year output 140,439 tons.

MONMOUTH COAL MINING CO.

Brereton Shaft No. 1 ,No. 5 Seam, 5 to 4½ ft. thick.
PO—Brereton, Ill., **SP**—Norris, Ill.; **CTY**—Fulton; **RR**—C. B. & Q., Buda-Carton-Rushville Br.
PR—W. J. Spencer.....Brereton, Ill.
TR—J. P. Daily, " "
GM—W. J. Spencer, " "
PA—W. H. Trudgen, " "
EM—C. P. Jacobson, " "
GS—C. P. Jacobson, " "
EE—Harvey Williams ...Canton, Ill.
MM—Geo. L. Luther, " "
SCO—Brereton Merc. Co., Buyer, J. P. Daily.
S of H—2 Elec. loco.; track gauge 36 in.
S of M—Hand.
PP—2 Water tube, 2 return tubular boilers, Kewanee, Ottumwa and Frost makes, total 550 H. P., 2 gen. units, 1-110 polts, D. C. and 1-250 volts, D. C., 1 pump.
EMP—285. Last fiscal year output 127,480 tons.
Sales Agent, C. W. Hulit, Brereton, Ill.

MONTGOMERY BROS. & LANGWITH.

Langwih Mine; Shaft; No. 7 Seam, 78 in. thick.
PO—Pinckneyville, Ill.; **SP**—Same; **CTY**—Perry; **RR**—W. C. & W.
PR—John Montgomery, Pinckneyville, Ill.
TR—Wm. Montgomery, " "
PA—Wm. Montgomery, " "
S of H—Mules.
S of M—Hand.
PP—1 Return tubular boiler, 25 H. P.
EMP—10. Last fiscal year output 7,146 tons.
Successors to the Langwith Coal Co.

MONTOUR COAL CO.

General Office, Oliver Bldg., Pittsburgh, Pa.
PR—W. K. Field, ...Pittsburgh, Pa.
TR—Wm. Miller, " "
GM—George W. Schluederberg, Pittsburgh, Pa.
PA—F. E. Now, ...Pittsburgh, Pa.
GS—Arthur Neale..........Girard, Ill.

Sales Agency, Pittsburgh Coal Co., Chicago, Ill.
Virden Mine; Shaft; No. 6 Seam, 72 to 96 in. thick.
PO—Virden, Ill.; **SP**—Same. **CTY**—Macoupin; **RR**—C. B. & Q., C. & A.
S of H—2 Elec. loco.; track gauge 36 in.
S of M—10 Elec. mach.
PP—8 Return tubular boilers, total 1,000 H.P., 2 gen. units 275 volts D. C., 1 pump.
EMP—300.

Girard Mine, Shaft; No. 6 Seam, 72 to 96 in. thick.
PO—Girard, Ill.; **SP**—Same: **CTY**—Macoupin; **RR**—C. B. & Q., C. A.
S of H—2 Elec. loco. and mules.
S of M—Hand.
PP—5 Return tubular boilers, total 600 H. P., gen. unit 275 volts D. C., 1 pump.
EMP—370.

Auburn Mine; Shaft; No. 6 Seam, 84 in. thick.
PO—Auburn, Ill.; **SP**—Same; **CTY**—Sangamon; **RR**—C. & A.
S of H—Rope and mules; track gauge 31 in.
S of M—Hand.
PP—3 Return tubular boilers, total 360 H. P., 1 pump.
EMP—90.
Note—Idle November 1st.

Springfield Mine; Shaft; No. 5 Seam, 72 in. thick.
PO—Springfield, Ill.; **SP**—Same; **CTY**—Sangamon; **RR**—C. & A., C. P. & St. L.
S of H—3 Elec. loco.; track gauge 36 in.
S of M—Hand.
PP—3 Return tubular boilers, total 300 H.P., 2 gen. units 275 volts D. C., 2 pumps.
EMP—190.
Successors to the Illinois Collieries Co.

MT. OLIVE COAL CO.

General Office, 714 Reisch Bldg., Springfield, Ill.
No. 5 Mine; Shaft; No. 6 Seam; 96 to 102 ins thick.
PO—Mt. Olive, Ill.; **SP**—Same; **CTY**—Macoupin; **RR**—Illinois Central.
PR—Eugene Colgan.....Springfield, Ill.
GM—Eugene Colgan, " "
PA—Eugene Colgan, " "
TR—Howard E. Colgan, " "
GS—Al. Hunter........Mt. Olive, Ill.
MS—Theo. Smithansen " "
S of H—Mules and 2 elec. locos. Track gauge 26 in.
S of M—18 Comp. air machines.
PP—1 water tube boilers, 5 return tubular boilers, total 750 H. P., 6 Gen. units, 250 volts D. C., 1 pump, 2 air compressors. Purchase power.
EMP—275. Last fiscal year output 252,000 tons.
Note—Mine being operated under 5 year lease from Madison Coal Corporation.

MT. OLIVE & STAUNTON COAL CO.

General Office, Staunton, Ill.
GM—T. T. Brewster......St. Louis, Mo.
PA—T. T. Brewster, " "
EM—H. M. Killmar..Staunton, Ill.
Mine No. 1; Shaft; No. 6 Seam, 60 to 78 in. thick.
PO—Staunton, Ill.; **SP**—Same; **CTY**—Macoupin; **RR**—L. M.
MS—Hugh Wilson......Staunton, Ill.
S of H—2 Elec. loco. and mules; track gauge 26 in.
S of M—7 Elec. mach.
PP—4 O'Brien return tubular boilers, total 500 H. P., 2 gen. units 250 volts D. C., 1 pump.

No. 2 Mine; Shaft; No. 6 Seam, 75 to 86 in. thick.
PO—Williamson, Ill. **SP**—Same—**CTY**—Madison; **RR**—L. & M.
MS—John Westwood, Staunton, Ill., R. D. No. 15.
S of H—2 Elec. loco. and mules; track gauge 42 in.
S of M—15 Elec. mach.
PP—5 O'Brien return tubular boilers, total 750 H. P., 2 gen. units, 250 volt D. C., 1 pump.
EMP—560. Last fiscal year output 651,061 tons.
Operate a washery in conjunction with this mine at Edwardsville, Ill.

MOUNT VERNON COAL CO.

PO—Mt. Vernon, Ill.
No report.

MOWEAQUA COAL MINING & MANFG. CO., (THE)

Mine No. 1, Shaft, No. 5 Seam, 6 to 5 ft. thick.
PO—Moweaqua, Ill.; **SP**—Same, **CTY**—Shelby; **RR**—Main Line. I.C. Ry.
PR—Geo. A. Kautz....Moweaqua, Ill.
TR—R. W. Snyder, " "
GS—Chas. Abl, " "
PA—Chas. Abl, " "
EE—Wm. Heriot, " "
SM—John D. Wolf, " "
GM—S. A. Shafer....Assumption, Ill.
EM—Glen. A. Shafer......Pana, Ill.
S of H—Mules and 1 elec. loco.; track gauge 40 in.
S of M—8 Elec. machines.
PP—4 Return tubular boiler, total 320 H. P., 1 gen. unit 250 volts D. C.
EMP—100. Annual output 50,000 tons
Sales Agent, N. B. Stover.

MULBERRY HILL COAL CO.

PO—Freeburg, Ill.
No report.

MURPHY, LINSKEY & KASHER COAL CO.

General Office, Braidwood, Ill.
PR—John Murphy......Braidwood, Ill.
TR—John Murphy, " "
GM—John Murphy, " "
GS—John Murphy, " "
PA—P. J. Linskey, " "
EM—T. Linskey..........Pontiac, Ill.
MM—Thos. Dudac, " "
Sales Agent, P. J. Linskey, " "

M., L. & K. Mine, Shaft, No. 6 Seam, 5 ft. thick.
PO—Pontiac, **SP**—Same, **CTY**—Livingston; **RR**—C. & A., I. C. & Wab
MS—Thos. Kasher........Pontiac, Ill.
S of H—Mules; track gauge 32. in
S of M—Hand.
PP—2 return tubular boilers.

NATIONAL COAL MINING CO.

National Mine; Shaft; No. 5 Seam, 48 in. thick.
PO—Farmington, Ill.; **SP**—Middle Grove, Ill.; **CTY**—Fulton; **RR**—M. & St. L.
PR—L. D. Fletcher..Yates City, Ill.
TR—H. A. Sloan,
GM—T. McMorrew...Farmington, Ill.
PA—T. McMorrow, " "
GS—T. McMorrow, " "
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—2 return tubular boilers, total 250 H. P., 1 pump.
EMP—175.

NEW ENTERPRISE COAL CO.

General Office, Chicago, Ill.
New Enterprise Mine, Stripping, No. 6 Seam, 6 to 8 ft. thick.
PO—Marion, Ill.; **SP**—Herrin and Marion, Ill., **CTY**—Williamson; **RR**—C. B. & Q. and Mo. Pac.
PR—A. B. McLaren....Marion, Ill.
TR—F. C. Honnold, Fisher Bldg., Chicago, Ill.
GM—F. C. Honnold. Fisher Bldg., Chicago, Ill.
GS—A. B. McLaren......Marion, Ill.
PA—A. B. McLaren, " "
EM—Roy Adams........Herrin, Ill.
MM—Wm. Dawkins......Marion, Ill.
EE—Wm. Johnson, " "
S of H—1 Steam loco., track gauge 4 ft. 8½ in.
S of M—Steam shovels.
PP—Power furnished from Public Service Co.
EMP—20.
Sales Agent, O. M. Burnell, Chicago, Ill.

NEW NATIONAL COAL & MINING CO.

New National Mine, Shaft, 6½ ft. thick.

(Continued on Next Page.)

New National Coal & Mng. Co.—Cont.
PO—Belleville, Ill., SP—Same CTY—St. Clair; RR—I. C. Ry.
PR—A. L. Wright........Belleville, Ill.
TR—Anderson Wright, " "
GM—Chas. Pointon, " "
PA—Chas. Pointon, " "
EM—Wm. Groom,........Belleville, Ill.
S of H—Mules; track gauge 3 ft.
S of M—Hand.
PP—Boiler 90 H. P., 1 pump.
EMP—40. Last fiscal year output 69,000 tons.

NEW STAUNTON COAL CO.

General Office, St. Louis, Mo.
No. 1 Mine; Shaft; No. 6 Seam, 72 in. thick.
PO—Livingston, Ill.; SP—Same; CTY—Madison; RR—C. & E. I., Big Four.
PR—J. E. Rutledge......St. Louis, Mo.
GM—J. E. Rutledge, " "
TR—Charles Gilbert, " "
PA—C. E. House......Livingston, Ill.
EM—J. A. Hebenstreit, " "
MS—T. G. Hebenstreit, " "
EE—Herman Becker, " "
S of H—3 Elec. loco. and mules; track gauge, 42 in.
S of M—17 Elec. mach.
PP—8 Return tubular boilers, total 1,000 H. P., 3 gen. units, 250 volts D. C., 1 pump.
EMP—675. Last fiscal year output, 938,634 tons.
Sales Agency, Rutledge & Taylor Coal Co., St. Louis, Mo.

NICHOLSON COAL CO.

Nashville, Shaft; 5½ ft. to 6 ft. thick.
PO—Nashville, Ill. SP—Same; CTY—Washington; RR—L. & N.
GM—T. A. Nicholson......Nabville, Ill.
PA—T. A. Nicholson, " "
GS—L. R. Nicholson, " "
MS—A. Johnson, " "
S of H—Mules; track gauge 24 in.
S of M—Hand.
PP—3 Brownell return tubular boilers, total 250 H. P.
EMP—47. Last fiscal year output 32,300 tons.

NOKOMIS COAL CO.

General Office, Security Bldg., St. Louis, Mo.
No. 1 Mine; Shaft; No. 6 Seam; 72 to 84 in. thick.
PO—Nokomis, Ill.; SP—Same; CTY—Montgomery; RR—Big Four, C. & E. I.
PR—J. E. Rutledge....St. Louis, Mo.
GM—J. E. Rutledge, " "
TR—A. J. Nason........St. Paul, Minn.
EM—C. W. Smith, " "
EE—H. C. Hebenstreit, " "
GS—J. P. Hebenstreit....Nokomis, Ill.
S of H—3 storage battery loco; track gauge 42 in.
S of M—10 Sullivan Elec. mach.
PP—4 Brownell return tubular boilers, total 700 H. P., 240 volts A. C., 3 phase 60 cycles. Power purchased.
EMP—300. Last fiscal year output 400,000 tons.

NORRIS COAL MINING CO.

General Office, Davenport, Iowa.
Norris Mine, Shaft, No. 5 Seam, 4 ft. thick.
PO—Norris, Ill., SP—Same, CTY—Fulton; RR—C. B. & Q.
PR—A. E. Walsh....Davenport, Iowa.
TR—C. H. Walsh....Burlington, Iowa.
CM—E. J. Walsh....Davenport, Iowa.
GS—Joseph Quigley......Canton, Ill.
EM—Joseph Quigley, " "
PA—A. E. Whitehead....Norris, Ill.
MM—C. M. Geer, " "
S of H—Mules; track gauge 32 in.
S of M—Hand
PP—3 Return tubular boilers, total 300 H. P., 1 pump.
EMP—250. Last fiscal year output 134,000 tons.
Sales Agent. Wm. Lev. Davenport, Iowa.
(Old information.)

NORTH BREESE COAL & MNG CO.

North Mine, Shaft; No. 6 Seam; 6 to 8 ft. thick.
PO—Breese, Ill.; SP—Same; CTY—Clinton; RR—B. & O., and S. W., main line.
PR—Chas Schrocter, South Side Bank St. Louis, Mo.
GM—John Schrocter, South Side Bank St. Louis, Mo.
PA—John Schrocter, South Side Bank St. Louis, Mo.
TR— A. J. Tilden, South Side Bank Bldg., St. Louis, Mo.
Asst. GM—Frank F. Tirre, Breese, Ill.
MS—Frank F. Tirre, " "
EE—Chas. Casey.........Breese, Ill.
S of H—Mules and 2-12 ton elec. loco; track gauge 36 in.
S of M—14 Elec. mach.
PP—2 Brownell and 4 Erie City Return tubular boilers total 960 tons, 1 gen. unit, 250 volts, D. C., 1 pump.
EMP—300. Last fiscal year output 266,401 tons.
Sales Agent, John Schrocter, St. Louis, Mo.

NORTHERN COAL CO.

General Office, Chicago, Ill.
PR—W. R. Tapper........Chicago, Ill.
TR—W. R. Tapper, " "
GM—J. H. Harmon, " "
GS—R. W. Williams....Harrisburg, Ill.
MS—Geo. Williams......Dempsey, Ill.

Hickory Hill Mine; Slope; No. 5 Seam; 60 to 66 in. thick.
PO Dempsey, Ill.; SP—Same; RR—L. & N.
S of H—Rope.
S of M—4 elec. mach.
EMP—100. Last fiscal year output 75,000 tons.

High Prairie Mine; Stripping; No. 6 Seam; 72 to 90 in. thick.
PO—Millstadt, Ill.; SP—Same; CTY—St. Clair; RR—M. & O.
S of H—2 steam loco.
EMP—50. Last fiscal year output 100,000 tons.

OAKDALE COAL MINING CO.

Oakdale Mine; Shaft; Seam 72 to 80 in. thick.
PO—Belleville, Ill.; SP—Same; CTY—St. Clair; RR—L. & N.
PR—Chas. Rowland, ...Belleville, Ill.
TR—Enos Harding, " "
GM—Enos Harding, " "
PA—Enos Harding, " "
MS—Enos Harding, " "
S of H—1 Elec. loco.; track gauge 24 in.
S of M—Hand.
PP—4 Return tubular boilers, 1 gen. unit 275 volts A. C., 1 pump.
EMP—28. Last fiscal year output 36,302 tons.
Sales Agency, Glendale Coal Co, and St. Louis Coal Co., St. Louis, Mo.

ODIN COAL CO.

Odin Mine; Shaft; No. 6 Seam, ft. thick.
PO—Odin, Ill; SP—Same; CTY—Marion; RR—B. & O., S. W.
GM—C. H. Morrison........Odin, Ill.
PA—C. H. Morrison, " "
MS—G. A. Smith, " "
S of H—Elec. loco.
S of M—Elec. mach.
PP—4 Boilers, gen. units 250 volts D. C.
EMP—215.
(Old information.)

O'GARA COAL CO.

General Office, Marquette Bldg., Chicago. Ill.
PR—T. J. O'Gara.......Chicago, Ill.
TR—T. S. Jones, " "
PA—E. Brenan.......Harrisburg, Ill.
GS—R. J. Harrigan, " "
EM—R. D. Brown,
MM—C. W. Dixon, " "
EE—Horace Rowlings, " "
Store Buyer, Edw. Brenan, " "
Store Mgr., A. M. Stone.
Sales Agent, J. R. McFarland, Marquette Bldg., Chicago, Ill.

No. 1 O'Gara, Shaft, No. 5 Seam, 4½ to 6 ft. thick.
PO—Harrisburg, Ill., SP—Same. CTY—Saline; RR— C. C. C. & St. L.
MS—John Howell......Harrisburg, Ill.
S of H—Mules; 2 Elec. loco.; track gauge 40 in.
S of M—10 Elec. machines.
PP—4 Return tubular boilers, total 600 H. P., 1 gen. unit, 250 volts, D. C., 2 pumps.
EMP—250. Last fiscal year output 250,000 tons.

No. 3 O'Gara, Shaft, No. 5 Seam, 5 to 7 ft. thick.
PO—Harrisburg, Ill., SP—Same. CTY—Saline; RR—Big Four.
MS—W. H. Strickland..Harrisburg, Ill.
S of H—Mules; 2 elec. loco., track gauge 36 in.
S of M—12 Elec. machines.
PP—6 Return tubular boilers, total 900 H. P., 3 gen. units, 250 volts D. C., 2 pumps.
EMP—300. Last fiscal year output 200,000 tons.

No. 4 O'Gara, Shaft, No. 5 Seam, 5½ to 7½ ft. thick.
PO—Harrisburg, Ill.; SP—Same, CTY—Saline; RR—Big Four.
MS—Geo. McMath.....Harrisburg, Ill.
S of H—Mules; 2 elec. loco., track gauge 41 in.
S of M—12 Elec. mach. and hand.
PP—4 Return tubular boilers, total 600 H. P., 1 pump.
EMP—325. Last fiscal year output 195,000 tons.

No. 7 O'Gara, Shaft, No. 5 Seam, 5½ to 6½ ft. thick.
PO—Harrisburg, Ill., SP—Carrier Mills, Ill., CTY—Saline; RR—Big Four
MS—Wiliam Evans....Harrisburg, Ill.
S of H—Mules. 1 elec. loco. Track gauge 42 in.
S of M—6 Elec. machines.
PP—2 return tubular boilers, total 300 H.P., 1 gen, unit, 250 volts, 1 pump.
Note—Idle at present.

No. 8 O'Gara, Shaft, No. 5 Seam, 4 to 5 ft. thick.
PO—Eldorado, Ill. SP—Same. CTY—Saline. RR—C.C.C.&St. L.
MS—Richard Neeson.....Eldorado, Ill.
S of H—Mules, 2 elec. loco. Track gauge 40 in.
S of M—8 Elec. machines.
PP—4 return tubular boilers, total 600 H.P., 1 gen. unit, 250 volts D. C., 2 pumps.
EMP—200. Last fiscal year output 160,000 tons.

No. 9 O'Gara, Shaft, No. 5 Seam, 5½ to 7 ft. thick.
PO—Harrisburg, Ill. SP—Same. CTY—Saline. RR—Big Four.
MS—Fritz Baumer.....Harrisburg, Ill.
S of H—Mules, 3 elec. loco. Track gauge 36 in.
S of M—15 elec. machines.
PP—5 return tubular boilers, total 750 H.P., 2 gen. units, 250 volts D. C., 3 pumps.
EMP—450. Last fiscal year output 480,000 tons.

No. 12 O'Gara, Shaft, No. 5 Seam, 4½ to 5½ ft. thick.
PO—Harrisburg, Ill. SP—Same. CTY—Saline. RR—Big Four.
MS—John Howell......Harrisburg, Ill.
S of H—Mules. 1 elec. loco. Track gauge 36 in.
S of M—6 elec. machines.
PP—4 return tubular boilers, total 600 H.P., 1 Gen. unit, 250 volts D. C., 2 pumps.
EMP—215. Last fiscal year output 165,000 tons.

No. 14 O'Gara, Shaft, No. 5 Seam, 5 to 7½ ft. thick.
PO—Harrisburg, Ill., SP—Ledford, Ill. CTY—Saline. RR—Big Four.
MS—Wm. Evans, ... Harrisburg, Ill.
S of H—Mules, 2 elec. loco. Track gauge 42 in.
S of M—10 elec. machines
PP—5 return tubular boilers, total 750 H.P., 1 gen. unit, 250 volts D. C. 2 pumps.
EMP—325. Last fiscal year output 290,000 tons.

Nos. 10 and 11, O'Gara, Shafts, No. 5 Seam, 4 to 5 ft. thick.
PO—Eldorado, Ill. SP—Same. CTY—Saline. RR—Big Four and I.C. Rr.
MS—Richard Neeson....Harrisburg, Ill.
S of H—Mules and 3 elec. loco. Track gauge 42 in.
S of M—18 elec. mining machines.
PP—8 return tubular boilers, total 1,200 H.P., 2 gen. units, 250 volts, D.C., 2 pumps.
EMP—485. Last fiscal year output 363,000 tons.

No. 15, O'Gara, Shaft, No. 5 Seam, 4½ to 6½ ft. thick.
PO—Harrisburg, Ill. SP—Carrier Mills, Ill. CTY—Saline. RR—Big Four.
MS—Wm. Evans. .. Harrisburg Ill.
S of H—Mules and 2 elec. loco. Track gauge 42 in.
S of M—8 Elec. mining machines.
PP—4 return tubular boilers, total 600 H.P., 1 gen. unit. 250 volts D. C., 2 pumps.
EMP—300. Last fiscal year output 265,000 tons.

OGLESBY COAL CO.

Oglesby Mine, Shaft, Seam No. 2, 5 to 2 ft. thick.
PO—Oglesby, Ill. SP—Same. CTY—La Salle. RR—C.M.&St. P., Ill. Cent.
PR—F. T. Bent. ...... Oglesby, Ill.
TR—H. A. Bent, ... Oglesby, Ill
PA—J.R. Bent, " "
GS—J.R. Bent, " "
SCO—Bent Brothers Co.
SM—A.M. Corbus. .... Oglesby. Ill.
S of H—Mules and 2 elec. loco. Track gauge 37 in.
S of M—Hand.
PP—6 return tubular boilers, total 900 H.P., Gen., 250 volts D.C.,
EMP—450. Last fiscal year output 166,185 tons.

OLD BEN COAL CORPORATION

General Office, Chicago, Ill.
Old Ben Nos. 8 and 9. Spiralizer washery, Shaft, No. 6 Seams, 9 to 12 ft. thick.
PO—West Frankfort, Ill.; SP—Same; CTY—Franklin. RR—C.&E.I., C. B. & Q., and I. C.
PR—D. W. Buchanan......Chicago, Ill.
TR—Gordon Buchanan, " "
PA—P.W. Beda, " "
MS—James Dunn, West Frankfort, Ill.
SCO—Coalfield Co....W. Frankfort, Ill.
S of H—26 elec. locos.; track gauge 42 in.
S of M—64 elec. mach.
PP—4 Water tube and 8 return tubular boilers, total 2800 H. P., 1150 K. W., 250 volts D. C., 1 pump.
EMP—1500. Last fiscal year output 1,500,000 tons.

Sales Agencies, Buchanan Coal Co., Chicago, Ill.; Omaha, Neb., and Minneapolis, Minn.; Petit Coal Co., Milwaukee, Wis.

PANA COAL CO.

Mines Nos. 1 and 2, Shafts, No. 6 Seam, 7 ft. thick.
PO—Pana, Ill. SP—Same. CTY—Christian. RR—I.C., Big Four, C.E.I. & B.&O.S.W.
James M. Taylor and Francis R. Roberts, Receivers, Taylorville, Ill.
PR—S.A. Shafer, ... Pana, Ill.
TR—J.L. Long .... Pana Ill
S of H—2 elec. loco. Track gauge 42 in.
S of M—Hand.
PP—5 return tubular O'Brien boilers, total, 625 H.P., 1 gen. unit, 250 volts D.C.

PARADISE COAL CO.

Paradise Mine; Shaft; No. 6 Seam; 84 to 122 in. thick.
PO—Du Quoin, Ill.; SP—Paradise, Ill.; CTY—Perry; RR—I. C., Eldorado Div.
PR—J. H. Forester........DuQuoin, Ill.
GM—James Forester, " "
PA—James Forester, " "
TR—H.W. Tolle, ... Cairo, "
MS—R.J. Forrester, .. Du Quoin, "
EM—R.J. Forrester, " "
EE—O.C. Jackson, " "
S of H—Mules and 6 elec. loco. Track gauge 3 ft.
S of M—13 elec. mach.
PP—5 Return tubular boilers, total 650 H.P., 3 gen. units, 250 volts, A. C., 1 pump.
EMP—400. Last fiscal year output 480,000 tons.
Sales Agent, Wickham Coal Co., St. Louis, Mo.

PEABODY COAL CO.

General Office, 332 So. Michigan Ave., Chicago, Ill.
PR—F. S. Peabody, ...Chicago, Ill.
VPR—C. J. Gray, " "
TR—J. D. Adams, " "
GM—W. H. Leland, " "
PA—H. E. Campbell, " "
Chief EM—M. F. Peltier, " "
Sales Mgr., S. Peabody, Chicago, Ill.

Marion No. 3 Mine; Shaft; No. 6 Seam; 102 in. thick.
PO—Marion, Ill.; SP—Peabody Mines Nos. 2 and 3, Ill.; CTY—Williamson; RR—C. & E. I., C. B. & Q., Iron Mtn.
MS—John D. Thomas......Marion, Ill.
S of H—5 Elec. loco and mules; track gauge 40 and 42 in.
S of M—30 Elec. mach.
PP—6 Return tubular boilers, total 1500 H.P., 3 gen. united 250 volts D.C., 5 pumps.
Emp—676; Last fiscal year output 712,000 tons.

Pawnee No. 5 Mine; Shaft; No. 6 Seam, 89 in. thick.
PO—Pawnee, Ill.; SP—Same; CTY—Sangamon; RR—C. & I. M.
MS—H. M. Young.......Pawnee, Ill.
S of H—2 15-ton elec. loco. and mules; track gauge 40 in.
S of M—Hand.
PP—4 Return tubular boilers, total 1000 H.P., 2 gen. units 250 volts D.C., 1 pump.
EMP—342; last fiscal year output 495,000 tons.

Sherman No. 6 Mine; Shaft, No. 5 Seam, 72 in. thick.
PO—Sherman, Ill.; SP—Same; CTY—Sangamon; RR—C. & A., Peabody Switch.
MS—M. White, Sherman, Ill.
S of H—3 Gasoline loco.; track gauge 42 in.
S of M—Hand.
PP—3 Return tubular boilers, total 750 H.P., 1 pump.
EMP—346; Last fiscal year output 355,000 tons.

Kincaid No. 7 Mine; Shaft; Kincaid No. 8 Seam, 90 in. thick.
PO—Taylorville, Ill.; SP—Kincaid, Ill.; CTY—Christian; RR—C. & I. M.
MS—H. N. Young........Kincaid, Ill.
S of H—15 Elec. loco.; track gauge 42 in.
S of M—20 Elec. mach.
PP—2- 400 K. W. M. G. Sets, 2300 volts A. C., 250 volts

D.C., 1 flywheel set, one 1000 H.P. hoist motor, 3 phase, 60 cycles, 1 pump; power purchased at 2300 volts A.C.
Last fiscal year output 180,000 tons. Developing.

Kincaid No. 8 Mine; Shaft; No. 6 Seam, 90 in. thick.
PO—Taylorville, Ill.; SP—Humphreys, Ill.; CTY—Christian; RR—C. & I. M.
MS—D. L. Reese, Taylorville, Ill.
S of H—Elec. loco.; track gauge 42 in.
S of M—20 Elec. mach.
PP—Power purchased.
New mine.

No. 21 Stonington Mine.
PO—Stonington, Ill.; SP—Same; CTY—Christian; RR—Wabash.
MS—J. E. Brennan....Stonington, Ill.

Nokomis No. 10, Kortkamp No. 11, Witts No. 12 and 14, and Taylor Springs No. 15. no longer connected with Peabody Coal Co.

PENWELL COAL MINING CO.
Penwell Mine, Shaft, No. 6 Seam, 10 to 6 ft. thick.
PO—Pana, Ill. SP—Same. CTY — Christian. RR—Ill. Cent. Ry.
PR—Geo. V. Penwell, 39 Adams St. Chicago, Ill.
TR—Warren Penwell, ... Pana, Ill.
GM—Warren Penwell, " "
PA—Warren Penwell, " "
GS—Geo. Rollo, " "
S of M—Mules and 3 elec. loco. Track gauge 42 in.
S of M—Hand.
PP—6 water tube boilers, 5 gen. units, 250 volts.
EMP—300. Annual output 280,000 tons.

PEORIA DISTRICT COLLIERY CO.
Out of business. Mine dismantled.

PEOPLES COAL CO.
Lebanon Mine; Shaft; No. 7 Seam, 54 to 60 in. thick.
PO—Lebanon, Ill.; SP—Same; CTY—St. Clair; RR—B. & O., S. W.
PR—Mrs. Margaret Mowe..Lebanon, Ill.
TR—W. H. Chapple, " "
GM—Thos. Mowe, " "
PA—W. H. Chapple, " "
GS—W. H. Chapple, " "
MS—Thos. Mowe, " "
S of H—Mules.
S of M—6 Comp. air mach.
PP—1 Atlas return tubular boilers, total 200 H. P., 1 compressor, 1 pump.
EMP—40. Last fiscal year output 36,000 tons.
Sales Agent, W. H. Chapple, Lebanon, Ill.
Successors to the Lebanon City Coal Co.

PITTSBURGH MINING CO.
Pittsburgh Mine; Shaft; 1st Seam; 66 to 84 in. thick.
PO—Belleville, Ill.; SP—Same; CTY—St. Clair; RR—Southern.
PR—Louis Michaelis.....Belleville, Ill.
TR—Louis Michaelis, " "
GS—Louis Michaelis, " "
GM—Edw. Michaelis, " "
EM—Edw. Michaelis, " "
S of H—Mules. Track gauge 24 in.
PP—1 water tube and 1 return tubular boiler, total 200 H. P., 3 pumps.
EMP—42. Last fiscal year output 29,051 tons.

POCAHONTAS MINING CO.
General Office, Rialto Bldg., St. Louis, Mo.
Pocahontas Mine, Shaft, No. 6 Seam, 7 ft. thick.
PO—Pocahontas, Ill. SP—Same. CTY—Bond. RR—Vandalia.
PR—Aug. F. Klasing, St. Louis, Mo.
TR—Aug. F. Klasing, " "
GM—Aug. F. Klasing, " "
Clerk at Mine—O. G. Esslinger, Pocahontas, Ill.
CE—Frank Kalous......Pocahontas, Ill.
MS—John B. Ritchie, " "
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—1 pump, 3 water tube boilers, 1 Erie and 2 Wrangler, each 150 H. P.
EMP—125-200. Last fiscal year output 33,637 tons.
Sales agent, Berry-Bergs Coal Co., St. Louis, Mo.

POND CREEK COAL CO.
Franklin Mine; Shaft; No. 6 Seam; 108 in. thick.
PO—Herrin, Ill. SP—Freeman; CTY—Williamson; RR—I. C. and C. B. & Q.
PR—Robert Dick..........Herrin, Ill.
TR—Henry Bailey, " "
GS—Fred Dick, " "
PA—Fred Dick, " "
CE—Fred Dick, " "
S of H—Mules and elec. loco. Track gauge 42 in.
S of M—25 puncher machs.
PP—2 B. & W. water tube boilers, 2 return tubular boilers, total 1050 H. P., 5 gen. units, 100 K. W., 2 pumps, 2 air compressors.
EMP—250. Last fiscal year output 185,000 tons.

PRAIRIE COAL CO.
General Office, Pierce Bldg., St. Louis, Mo.
Mine, Shaft, No. 6 Seam, 7 ft. thick.
PO—Belleville, Ill. CTY—St. Clair. RR St. Louis & O'Fallon Electric.
PR—Frank Aid, ... St. Louis, Mo.
TR—Frank Aid, " "
PA—Frank Aid, " "
MS—James Daniels, ...Belleville, Ill.
MM—John Siddall, " "
EE—Eli Siddall, " "
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—3 boilers, Brownell, total 375 H. P., 1 pump.
EMP—335. Last fiscal year output
PP—3 Return tubular boilers, pump.
Mine idle.

PRODUCERS COAL CO.
General Office, McCormick Bldg., Chicago, Ill.
Nos. 18 and 19 Mines; Shaft; No. 6 Seam; 108 to 144 in. thick.
PO—West Frankfort, Ill.; SP—Same; CTY—Franklin; RR—C. & E. I. Co. Ill. Div.
PR—F. S. Peabody......Chicago, Ill.
TR—J. Solari " "
GM—W. H. Leland, " "
PA—H. E. Campbell " "
MS—R M Medill, West Frankfort, Ill.
EM—M. B. Peltier......Chicago, Ill.
S of H—9 Elec. loco. and mules.
S of M—15 Elec. mach., 7 comp. air mach. and hand. Track gauge 42 in.
PP—12 Return tubular boilers, 1 gen. unit 250 volts D. C., 250 volts A. C., 60 cycle, 3 compressors, 6 pumps. Power purchased.
EMP—700. Last fiscal year output 440,000 tons.
Sales Agency, S. Peabody, Chicago, Ill. and J. K. Dering Coal Co., Chicago, Ill.
Successors to Dering Coal Co.

PRYCE COAL CO.
Pryce Coal Co. Mine; Shaft; No. 1 Seam; 36 to 48 in. thick.
PO—Coal Valley, Ill. SP—Same. CTY—Rock Island.
PR—J.J. Pryce, ... Coal Valley, Ill.
TR—A. W. Pryce, " "
GM—J.M. Pryce, " "
PA—J.M. Pryce, " "
S of H—Mules. Track gauge 27 in.
S of M—Hand and 1 elec. mach.
PP—3 return tubular boilers, 2 pumps. 1 gen. unit, 250 volts D. C.
EMP—40. Last fiscal year output 12,500 tons.

RANDOLPH COUNTY COAL CO.
General Office, Coulterville, Ill.
Granny Mine; Shaft; No. 6 Seam; 76 to 84 in. thick.
PO—Coulterville, Ill.; SP—Same; CTY—Randolph; RR— Illinois Southern.
PR—A. E. Powell.....Coulterville, Ill.
TR—S. D. Powell, " "
PA—S. D. Powell, " "
SM—S. D. Powell, " "
SCO—The Randolph Store, " "
S of H—Mules.
S of M—Hand.
PP—Three return tubular boilers, total 300 H. P., 1 gen, unit 250 volts D. C., 1 pump.
EMP—94. Last fiscal year output 101,750 tons.
Note—Successors to Randolph County Coal Mining Co.

RANDOLPH COUNTY COAL MINING CO.
Now Randolph County Coal Co.

REEB COAL CO.
Murphy Mine, Shaft No. 8 Seam, 6 ft. thick.
PO— Belleville, Ill. SP — Belleville, Ill. CTY—St. Clair. RR—I.C., Belleville & Carondelet Branch.
PR—Jos. Anton........Belleville, Ill.
TR—Phillip Reeb, " "
GM—Phillip Reeb, " "
PA—Phillip Reeb, " "
GS—James Murphy, " "
EM—Wm. Zelhnert, " "
S of H—Mules. Track gauge 22 in.
S of M—Hand.
PP—Buy elec. power. Motor hoist, 1 pump.
EMP—12. Last fiscal year output. 13,202 tons. Sales agents, Lenz Coal & Mining Co.

REND, W. P., COAL & COKE CO.
General Office, Chicago, Ill.
No. 2 Mine; Shaft; No. 6 Seam, 108 in. thick.
PO—Rendville, Ill.; SP—Herrin, Ill.; CTY—Williamson; RR—C. B. & Q., I. C.
GM—J. L. Ohle............Rend, Ill.
PA—J. L. Ohle, " "
EM—R. L. Adams——..—Herrin, Ill.
SM—Guy Minton, " "
S of H—Elec. loco. and mules.
S of M—Elec. mach.
PP—8 boilers, total 1,200 H. P., 3 gen units, 250 volts D. C.
EMP—450. Last fiscal year output 742,584 tons.

REND, W. P., COLLIERIES CO.
General Office, Chicago, Ill.
No. 1 Mine, Shaft, No. 6 Seam, 104 in. thick.
PO—Rend, Ill.; SP—Herrin, Ill.; CTY—Franklin; RR—C. B. & Q.
GM—J. L. Ohle, ... Rend, Ill.
PA—J. L. Ohle, " "
SM—R. E. Prigmore........Rend, Ill.
EM—R.L. Adams, ... Herrin, "
S of H—Elec. loco. and mules.
S of M—Elec. machines.
PP—8 boilers, toal 1200 H. P., 2 gen. unit 250 volts D.C.
EMP—400. Last fiscal year output 551,462 tons.

RITCHEY COAL CO.
No. 1 Mine; Shaft; No. 9 Seam; 78 to 96 in. thick.
PO—Pinckneyville, Ill.; SP—Same; CTY—Perry; RR—I. C.
PR—W. S. Wilson....Pinckneyville, Ill.
TR—S. S. Ritchey, " "
SUPT—W. T. Ritchey, " "
SCO—Wilson-Ritchey Store Co.
S of H—Mules.
S of M—Hand.
PP—4 Water tube boilers.
EMP—173. Last fiscal year output 162,000 tons.

ROANOKE COAL CO.
Roanoke Mine, Shaft, No. 2 Seam, 2½ ft. thick.
PO—Roanoke, Ill. SP—Same. CTY — Woodford. RR—A.T.&S.F.
PR—James Duggan........Roanoke, Ill.
GM—James Duggan, " "
PA—T.L. Duggan, " "
MS—Geo. DeWilde, " "
SCO—Roanoke Supply Co., Buyer, S. D. Spalding, Roanoke, Ill.
S of H—Mules.
S of M—Hand.
PP—5 boilers, total 400 H.P.
EMP—300. Last fiscal year output 140,000 tons.

ROYAL COLLIERY CO.
Now operated by Chicago, Wilmington & Franklin Coal Co.

RUTLAND COAL CO.
Out of business.

ST. LOUIS-CARTERVILLE COAL CO.
Dale Mine; Shaft; No. 6 Seam, 72 to 132 in. thick.
PO—Herrin, Ill.; SP—Same; CTY—Williamson; RR—I. M. & S.
PR—H. Dale..............Herrin, Ill.
TR—O. H. McNeill, " "
GM—O. H. McNeill, " "
GS—O. H. McNeill, " "
PA—O. H. McNeill, " "
EM—R. L. Adams, " "
MM—John Kenner, " "
S of H—1 Gasoline loco. and mules; track gauge, 36 in.
S of M—Hand.
PP—3 Return tubular boilers.
EMP—200.

ST. LOUIS-COULTERVILLE COAL CO.
PO—Coultersville. Ill.
No report.

ST. LOUIS & O'FALLON COAL CO.
Nos. 1 and 2 Mines, Shaft, Belleville No. 6 Seam, 6½ to 7½ ft. thick.
PO—East St. Louis, Ill. SP—Same. CTY—St. Clair. RR—St. Louis & O'Fallon.
PR—T. M. Jenkins, South Side Bank Bldg., St. Louis, Mo.
TR—Geo. E. Kauffman, South Side Bank Bldg., St. Louis, Mo.
MS—M. Saugrelet......Colilnsville, Ill.
EM—W.C. Wolf, Belleville, "
S of H—Mules and 5 elec. loco.
S of M—25 elec. mach.
PP—9 return tubular boilers, total, 1,800 H. P., 3 gen. uits, 1 pump.
EMP—800. Last fiscal year output 800,000 tons.

ST. PAUL COAL CO.
General Office 1368 Fullerton Ave, Chicago, Ill.
PR—Jas. Needham.......Chicago, Ill.
GM—Jas. Needham, " "
TR—F. G. Ranney,.......Chicago, Ill.
GS—Jas. Needham, " "
EM—C. F. Brenn.......Granville, Ill.
PA—J. T. Crocker......Chicago, "
MM—Barney Gately, Granville, "
John Chedister, .. Cherry, "

Granville No. 1, Shaft, Third vein No. 5, 42 in. thick.
PO—Granville, Ill. SP—Same. CTY—Putnam. RR—C.M.&St. P.
MS—Jas. Steele, ... Granville, Ill.
S of H—Mules. Track gauge 42 in.
S of M—Hand.
PP—6 return tubular boilers total 900 H.P., 1 gen. unit, 12½ K.W., D.C., 1 pump.
EMP—829. Last calendar year output 444,351 tons.

Cherry Mine, No. 2, Shaft, Third vein No. 5, 46 in. thick.
PO—Cherry, Ill. SP—Same. CTY—Bureau. RR—C.M.&St. P.Ry.
MS—Jas. Steele, ... Granville, Ill.
S of H—Mules. Track gauge 42 in.
S of M—Hand.
PP—6 Return tubular boilers, total 900 H.P. gen. unit, 12½ K.W.
EMP—808. Last calendar year output 422,496 tons.

SANGAMON COAL CO.
Sangamon Mine, Shaft, No. 5 Seam, 6 ft. thick.
PO—Springfield, Ill., SP—Same, CTY—Sangamon; RR—Ill. Cent., C. & A.
PR—H. K. Weber......Springfield, Ill.
TR—E. H. Buckley, " "
GM—E. H. Buckley, " "
PA—E. H. Buckley, " "
GS—John Vose, " "
S of H—Mules; track gauge 35 in.
S of M—Hand.
PP—1 pump, 5 return tubular boilers, total 250 H. P.
EMP—350. Last fiscal year output 247,000 tons.
Sales Agent, E. H. Buckley, Springfield, Ill.

SCRANTON & BIG MUDDY COAL MINING CO.
Scranton Mine, Shaft, No. 6 Seam, 8 to 6 ft. thick.
PO—Marion, SP—Same, CTY—Williamson; RR—St. Louis, Iron Mountain.
PR—Wm. R. Lewis.......Scranton, Pa.
TR—W. C. Cowles, " "
GM—R. C. Hill..........Marion, Ill.
GS—R. C. Hill, " "
PA—R. C. Hill, "
S of H—Mules; track gauge 36 in.
S of M—18 Comp. air mach.
PP—2 air comp., 2 pumps, 4 return tubular boilers, total 600 H. P.
EMP—200. Last fiscal year output 158,475 tons.
Sales Agent, DeVoy & Kuhn Coal & Coke Co., St. Louis, Mo.

SEARLS COAL COMPANY.
McClintock Mine; Shaft; No. 6 Seam; 84 to 114 in. thick.
PO—Johnston City, Ill; SP—Same; CTY—Williamson; RR—I. M. & S.
PR—E. C. Searls,....Johnston City Ill.
GM—E. C. Searls. " "
TR—C. F. Hooper, " "
GS—T. S. Cousins, " "
PA—Frank Swain, " "
MS—D. H. Shull. " "
EM—H. M. Goodnow. " "
MM—F. Anderson. " "
S of H—Mules and 2 elec. locos. Track gauge 42 in.
S of M—17 elec. machs.
PP—5 Return tubular boilers. total 750 H. P., 2 gen. units, 350 volts D. C 1 pump.
EMP—400. Last fiscal year output, 380,000 tons.
Note—Successors to Standard Collieries Coal Company.

SECURITY COAL & MINING CO., OF MISSOURI.
General Office, Security Bldg., St. Louis, Mo.
Security Mine, Shaft, No. 6 Seam, 72 to 78 in. thick.
PO—Duquoin, Ill.; SP—Same; CTY—Perry; RR—Ill. Cent., Main Line.
PR—J. E. Rutledge, St. Louis, Mo.
PA—W. J. Whitaker....St. Louis, Mo.
MS—J. B. Burkhardt, ..Duquoin, Ill.
EM—John Gibson, " "
EE—Jas. Morris.........Duquoin, Ill.
S of H—6 elec. and 4 storage battery loco. and mules. Track gauge 36 in.
S of M—9 Elec. mach.
PP—6 Return tubular boilers, total 1,200 H. P., 3 gen. units, 250 volts D. C., 1 pump.
EMP—470. Last fiscal year output 652,000 tons.
Sales Agency, Rutledge & Taylor Coal Co., St. Louis, Mo.

SESSER COAL CO.
Sesser Mine; Shaft; No. 7 Seam; 102 to 108 in. thick.
PO—Sesser, Ill.; SP—Same; CTY—Franklin; RR—C. B. & Q.
PR—T. C. Keller, Old Colony Bldg., Chicago, Ill.
TR—T. C. Keller, Old Colony Bldg., Chicago, Ill.
VP—A. B. Steffens, Old Colony Bldg., Chicago, Ill.
Secy—J. F. Norton, Old Colony Bldg., Chicago, Ill.
PA—T. P. Keller.........Sesser, Ill.
MS—Nels Johnson " "
MM—Lon Bateman " "
EE—Mr. Shreier, " "

(Continued on Next Page.)

Sesser Coal Co—Cont.
CE—R. L. Adams ....Herrin, Ill.
S of H—12 elec. locos. Track gauge 42 in.
S of M—7 elec and 30 comp. air machines.
PP—5 water tube and 3 return tubular boilers, total 1600 H. P., 2 gen. units, 240 volts D. C., 2 air comp. and 10 pumps.
EMP—650 to 700. Last fiscal year output 700,000 tons. Coke ovens, 2 Bee Hive.
Sales Agency, T. C. Keller & Co., 1575 Old Colony Building, Chicago, Ill.

SHARON COAL CO.
Sharon Mine; Shaft No. 6 Seam; 60 to 72 in. thick.
PO—Georgetown, Ill.; SP—Same; CTY—Vermillion; RR—Illinois Traction System.
PR—H. W. Morris....Georgetown, Ill.
TR—D. H. Bown. " "
GM—Frank P. Morris, " "
GS—Frank P. Morris, " "
PA—Frank P. Morris, " "
MS—Jas. O'Biant, " "
CE—Edw. Stedman, " "
MM—E. E. Smith, " "
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—2 Fire Tube Boilers (Atlas), total 240 H. P., 1 pump.
EMP—50. Last fiscal year output 38,834 tons.

SHARON COAL & BRICK CO.
See Sharon Coal Co.

SHOAL CREEK COAL CO.
General Office, Chicago, Ill.
No. 1 Mine; Shaft; No. 6 Seam; 72 to 90 in. thick. Operate washery.
PO—Panama, Ill.; SP—Same; CTY—Montgomery; RR—T. St. L. & N.
PR—Frank P. Blair.......Chicago, Ill.
TR—C. Rob Solberg, " "
GM—C. Rob Solberg, " "
PA—C. Robb Solberg, " "
GS E. F. Grabruck.......Panama, Ill.
EM—W. Baird, " "
MM—Henry C. Yohncke, " "
EE -P. T. Cherry, " "
S of H—6 elec. locos. Track gauge 38 in.
S of M—20 elec. mach.
PP—10 return tubular boiler, total 2,500 H. P., 2 gen. units, 250 volts D. C., 1 pump. Purchase power.
EMP—600. Last fiscal year output 571,652 tons.

SILVER CREEK COLLIERY CO.
General Office, Monmouth, Ill.
Silver Creek Mine, Shaft, No. 5 Seam, 50 to 54 in. thick.
PO—Farmington. Ill.. SP—Same. CTY—Fulton; RR—M. & St. L., Peoria Line and C. B. & Q., Beardstown Line.
PR—G. W. Gale.......Galesburg, Ill.
TR—H. W. Stewart....Monmouth, Ill.
PA—H. W. Stewart, " "
GM—W. W. McCullough, " "
MS—Frank Guthrie.....Farmington, Ill.
EM—Ralph Furguson....Monmouth, Ill.
S of H—Mules and 2 elec. locos., track gauge 38 in.
S of M—Hand.
PP—2 Return tubular boilers, Frost Murray. total 300 H. P., 2 gen. units, 220 volts D. C.
EMP—220. Annual output, 200,000 tons.
Sales Agent, H. W. Stewart, Monmouth, Ill.

SILVER CREEK VALLEY COAL CO.
Belleville, Ill. No report.

SIMMONS COAL CO.
Simmon Mine; Shaft; No. 5 Seam; 56 to 62 in. thick.
PO—Canton, Ill.; SP—Same; CTY—Fulton; RR—C. B. & Q.
PR—Thos. Simmons.......Canton, Ill.
GS—Thos. Simmons, " "
TR—J. L. Simmons, " "
GM—Chas. Simmons, " "
MS—Chas. Simmons, " "
EM—Chas Simmons, " "
S of H—Mules and 1 elec. loco. Track gauge 35 in.
S of M—Hand and 4 elec. mach.
PP—2 Murray water tube boilers, total 200 H. P., 2 gen units, 250 volts D. C., 2 pumps. Purchase power.
EMP—264. Last fiscal year output 97,388.6 tons.
State report.

SMITH-LOHR COAL MINING CO.
Springside Mine, Shaft, No. 6 Seam, 7½ to 10 ft. thick; operate washery.
PO—Pana, Ill.; SP—Same; CTY—Christian; RR—I. C., C. & E. I., Big Four; B. & O., Southwest & C. C. C. & St. Lo.
PR—R. Beckenheimer......Pana, Ill.
TR—R. Beckenheimer, " "
GM—B. Beckenheimer, " "
GS—R. G. Lohr, " "
EM—Wm. Barrowman, " "
S of H—Mules, and 2 elec. loco. Track gauge 28 in.
S of M—Hand.
PP—5 Return tubular boilers, total 600 H. P., 2 gen. units, 150 K. W.
EMP—275. Last fiscal year output 212,452 tons.

SOPER MINING CO.
Barnard Mine; Shaft; No. 6 Seam, 72 in. thick.
PO—Cutler, Ill.; SP—Same; CTY—Perry; RR—Wab., Chester & Western.
PR—A. Soper, ...Cutler, Ill.
MS—James Lister " "
S of H—Mules.
S of M—Hand.
PP—1 Return tubular boiler, 70 H.P., 1 pump.
EMP—40.
Successors to the Soper-White Mining Co. and the King City Coal Mining Co.

SOPER-WHITE MINING CO.
PO—Cutler, Ill.; CTY—Perry.
No report.

SOUTHERN COAL, COKE & MINING CO.
General Office, St. Louis, Mo.
PR—W. K. Kavanaugh..St. Louis, Mo.
GM—W. K. Kavanaugh, " "
TR—J. Y. Lockwood, " "
PA—J. Y. Lockwood, "
GS—F. S. Pfahler....Belleville, Ill.
EM—W. F. Davis, " "
MM—J. E. Richmond....St. Louis, Mo.
EE—J. E. Richmond, " "
Sales Manager, R. E. Eggerbrecht.

Muren, Avery, Oakhill and Glendale Mines, Shafts, No. 6 Seam; 72 to 96 in. thick.
PO—Belleville, Ill., SP— Same, CTY—St. Clair; RR—Southern R. R.
MS—Fred Grannilich and Al Severit.
S of H—Mules; track gauges; Avery 21 in., Oakland and Oakhill 22 in., Muren 24 in. and Germantown 21 in.
S of M—Oakland, Glendale and Muren hand; Avery, Oakhill, Germantown, machs; 4 machs at Germantown and 6 at Avery and Oakhill.
PP—10 Return tubular boilers.

Germantown & Oakland Mines abandoned.
Litle Oak Mine, Shaft; No. 6 Seam; 72 to 144 in. thick.
PO—Belleville, Ill., SP— Same, CTY—St. Clair; RR—Southern R. R., Main Line.
MS—Steve Herbert.....Belleville, Ill.
S of H—Mules and 1 gasoline loco. Track gauge 36 in
S of M—24 comp.. air mach.
PP—5 Return tubular boilers, O'Brien make, total H. P. 500, 1 air comp. 1 pump.
EMP—240. Last fiscal year output, 102,866 tons.

Shiloh Mine. Shaft. No. 6 Seam, 6 to 8 ft. thick; operate washery.
PO—Belleville, Ill., SP—Shiloh Sta., Ill., CTY—St. Clair; RR—Southern R. R., Main Line.
MS—F. J. Boettcher...Belleville. Ill.
S of H—3 gasoline and 1 storage battery locos.; track gauge 42 in.
S of M—11 Elec. mach.
PP—6 Return tubular boilers, total 700 H. P., 2 gen. units, 250 volts D. C., 1 pump.
EMP—380. Last fiscal year output, 132,263 tons.

New Baden Mine. Shaft, No. 6 Seam, 6½ to 10 ft. thick.

PO—New Baden, Ill.. SP—Same, CTY—Clinton; RR—Southern R. R.; Main Line.
MS—Wm. Phillips....New Baden, Ill.
S of H—6 Elec. loco., track gauge 36 in.
S of M—8 Elec. and 30 Comp air machs.
PP—4 O'Brien Water tube boilers, total, 1200 H. P., 1 gen. unit, 250 volts D. C., 2 air comp. and 3 pumps.
EMP—540. Last fiscal year output 504,396 tons.

Glendale Mine; Shaft; No. 6 Seam; 60 to 96 in. thick.
PO—Belleville, Ill.; SP—Same; CTY—St. Clair; RR—Southern. Main Line;
MS—Pete Noll..........Belleville, Ill
S of H—Mules; track gauge, 22 in.
PP—2 Return tubular boilers, and 1 pump.
EMP—14. Last fiscal year output, 4,873 tons.

SOUTH MOUNTAIN COAL CO.
No. 1 Mine; Slope; No. 5 Seam; 6 ft. thick
PO—Petersburg, Ill.; SP—Same CTY—Menard RR—C. P. & St L.
PR—Jos. Amberger......Petersburg, Ill.
GM—Jos. Amberger, " "
PA—Jos. Amberger, " "
GS—Jos. Amberger, " "
TR—C..A. Amberger, " "
S of H—Mules, track gauge 38 in.
S of M—Hand.
PP—2 Water tube boilers, total 150 H. P., and 1 pump.
EMP—14. Last fiscal year output 9,380 tons.

SPOON RIVER COAL CO.
Ellisville Mine, Shaft; "Ellisville No. 1" Seam; 3½ to 6 ft. thick.
PO—London Mills, Ill.; SP—Ellisville, Ill.; CTY—Fulton; RR—C.B.& Q.
Willard A. Schaeffer, Receiver, Rock Island, Ill.
MS—J. H. Morris......Galesburg Ill.
S of H—Gasoline locos.
S of M—Hand.
PP—2 Return tubular boilers; 4 pumps.
EMP—120. Last fiscal year output, 80,000 tons.

SPRING CREEK COAL CO.
Spring Creek Mine; Shaft; No. 5 Seam; 68 to 72 in. thick.
PO—Springfield, Ill.; SP—Same; CTY—Sangamon; RR—B. & O. S. W.; C. & A, and C. & N. W.
PR—Geo. Reisch, Sr...Springfield, Ill.
TR—Geo. Reisch, Jr., " "
GM—W. J. Walsh, " "
PA—W. J. Walsh, " "
MS—John Str.bel, " "
SM—H. F. Neuman, " "
S of H—Mules; track gauge 36 in.
S of M—Hand and 1 elec. mach.
PP—2 springfield boilers, 1 gen. unit. 110 volts D. C., 1 pump.
EMP—150. Last fiscal year output 140,000 tons.

SPRING VALLEY COAL CO.
General Office, Chicago, Ill.
PR—M. H. Taylor..........Erie, Pa.
GM—Acting, L. H. Smith, Chicago, Ill.
TR—Geo. A. Wheeler, Spring Valley, Ill.
PA—Geo. A. Wheeler..Spring Valley, Ill.
MS—R. M. Hill, " "
EM—W. N. Cole...Spring Valley, Ill.
MM—A. H. Halladay, " "
SCO—Seatonville Supply Co., Buyer, P. Y. Koyak.
Sales Agent, L. H. Smith, Chicago, Ill.

Nos. 1 and 3; Shaft; Seam, 3½ ft. thick; operate washery.
PO—Spring Valley, Ill.; SP—Same; CTY—Bureau; RR—C. R. I. & P., C. N. & W.
S of H—Mules; track gauge 41 in.
S of M—Hand.
PP—Erie boilers, total 900 H. P., 1 pump.

No. 4 Mine; Shaft; Seam; 3½ ft. thick.
PO—Seatonville, Ill.; SP—Same; CTY—Bureau; RR—C. & N. W.
S of H—Mules; track gauge 41 in.
S of M—Hand.
PP—Murray & Erie boilers, total 900 H. P., 1 gen. D. C., 1 pump.

No. 5 Mine: Shaft; Seam; 3½ ft. thick; washery.
PO—Dalzell, Ill.; SP—Same; CTY—Bureau; RR—C. & N. W.
S of H—2 Gasoline loco. and mules; track gauge 41 in.

S of M—Hand.
PP—Erie boilers, total 900 H. P., 1 pump.

SPRINGFIELD COAL MINING CO.
General Office, Springfield. Ill.
Nos. 1, 2, 3, 4, 5 and 6 Mines; Shafts.
PO—(1-2) Riverton, Ill., (3-4-5) Springfield, Ill., (6) Taylorville, Ill. RR—Wab., C. & A., B & O.
F. S Peabody, Receiver, Chicago, Ill.
No report.

SPRINGFIELD CO-OPERATIVE COAL CO.
Shaft Mine; No. 5 Seam, 5 ft. 10 in. thick
PO—Springfield, Ill.; SP—Same; CTY—Sangamon; RR—C. & A.
S of H—Mules and Elec. loco.
S of M—Hand.
PP—3 Boilers total 500 H. P.
EMP—158. Last fiscal year output 115,300 tons.

STANDARD COLLIERIES COAL COMPANY.
See Searls Coal Co.

STAR COAL CO.
Star Mine; No. 6 Seam; 72 to 108 in. thick.
PO—Freeburg, Ill.; SP—Same; CTY—St. Clair; RR—I. C., Cairo Short Line.
PR—P. J. Vogel........Freeburg, Ill.
TR—C. G. Zacher, " "
S of H—Mules.
S of M—9 Comp. air mach and hand.
PP—2 Return tubular boilers, total, 300 H. P., 1 comp., 1 pump and 1 injector.
EMP—85. Last fiscal year output. 100,000 tons.
Sales Agency, Kolb Coal Co.

STAR COAL CO. OF GALESBURG.
General Office, Galesburg, Ill.
PR—Thomas Fairbairn...Streator, Ill.
TR—R. J. Fairbairn....Galesburg, Ill.
PA—R. J. Fairbairn, " "
GM—W. R. Hawkins, " "
GS—J. J. Wood...........Cuba, Ill.
Sales Agent, W. R. Hawkins, Galesburg, Ill.

Fiatt No. 1, Shaft, No. 5 Seam, 5 ft. 2 in. thick.
PO—Fiatt, Ill.; SP—Same, CTY—Fulton; RR—C. B. & Q., Havana Branch.
MS—Wm. Donlaldson......Fiatt, Ill.
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—3 Return tubular boilers, total 250 H. P.
EMP—40. Last fiscal year output 28,000 tons.

Star No. 2, Slope, No. 5 Seam, 5 ft. 4in. to 4½ ft. thick.
PO—Cuba, Ill., SP—Same, CTY—Fulton; RR—C. B. & Q., Havana Branch.
MS—John Davis...........Cuba, Ill.
S of H—Rope and mule; track gauge 36 in.
S of M—Hand.
PP—2 Frost 18x72 boilers, total 250 H. P.
EMP—110. Last fiscal year output 67,849 tons.

No. 3 Mine, Shaft, No. 5 Seam, 5 ft. 4 in. to 4 ft. 8 in. thick.
PO—Cuba, Ill., SP—Same, CTY—Fulton; RR—C. B. & Q., Havana Branch.
MS—E. P. Evans..........Cuba, Ill.
S of H—Rope and mules; track gauge, 36 in.
S of M—Hand.
PP—2 Frost 72x18 boilers, total 250 H. P.
EMP—194. Last fiscal year output, 155,930. tons.

STOBS COAL COMPANY
Out of business.

STONINGTON COAL CO.
Shaft; No. 6 Seam; 8 ft. thick.
PO—Taylorville, Ill.; SP—Stonington, Ill.; CTY—Christian; RR— Wab.
PR—D. W. Johnston .. Taylorville, Ill.
TR—Roy A. Johnston, " "
GM—W. S. Ridgly, " "
MS—W. S. Ridgly, " "
PA—F. F. Banghman, " "
S of H—Mules and 4 elec. loco.; track gauge 42 in.
S of M—7 Elec. mach
PP—6 Water tube boilers, total 900 H. P., 2 gen. units, 250 volts, D. C. 1 pump
EMP—295. Last fiscal year output 228,176 tons.
Sales Agent. W. S. Ridgly.
(Old information.)

STREATOR CLAY MFG. CO., THE
Drift; No. 7 Seam; 33 in. to 40 in. thick.
PO—Streator, Ill.; SP—Same: CTY—La Salle; RR—Wab. & C. I. & S.
PR—R. H. Green......Streator, Ill.
TR—R. H. Green, " "
GM—R. H. Green, " "
MS—John Reynolds, "
PA—Geo. E. Connolly, "
S of H—Mules; Track gauge 34 in.
S of M—1 comp. air mach.
PP—Boilers total 750 H. P., Frost, 1 gen. unit. A. C., 3 phase. 60 cycles; 1 air comp.; 2 pumps.
EMP—45.

SUBURBAN COAL & MINING CO.
General Office, St. Louis, Mo.
Suburban Mine; Shaft; No. 6 Seam; 78 to 90 in. thick.
PO—Belleville, Ill.; SP—Signal Hill; CTY—St. Clair; RR—St. L. & B. E.
PR—Gustave Boehmer...St. Louis, Mo.
TR—Gustave Boehmer, " "
GM—John Guest........Belleville, Ill.
GS—John Guest, " "
PA—John Guest, " "
MS—John Guest. " "
CE—Walter Goalby, " "
EM—Wm. Reiss, " "
S of H—Mules and 1 gasoline loco.
PP—2 return tubular boilers, 1 gen unit. 1 pump.
EMP—140. Last fiscal year output 123,400 tons.

SUMMIT COAL & MINING CO.
Summit Mine; Shaft; Second Seam, 84 in. thick.
PO—Belleville, Ill. R. R. No. 3; SP—Summit Mine Switch, Ill.; CTY—St. Clair; RR—L. & N.
PR—Wm. Erwin........Belleville, Ill.
GM—Wm. Erwin, " "
GS—Wm. Erwin, " "
TR—Walter Lanxon, " "
PA—Walter Lanxon, " "
EM—O. Meng. " "
MS—Wm. Erwin, " "
S of H—Mules; track gauge 24 in.
S of M—Hand.
PP—2 Return tubular boilers, total

110 H. P., 1 gen. unit, 1 pump.
EMP—34. Last fiscal year output 19,969 tons.
Sales Agent, B. Avery, St. Louis, Mo.

SUNNYSIDE COAL COMPANY.

General Office, Chicago, Ill.
Sunnyside Mine, Shaft; No. 7 Seam; 7 to 12 ft. thick; operate washery.
PO—Herrin, Ill.; **SP**—Same; **CTY**—Williamson; **RR**—C. B. Q., and I. C.
PR—T. G. Warden......Chicago, Ill.
PA—Jno. J. Riggs, " "
MS—John Rollo..........Herrin, Ill.
S of H—Mules and 3 elec. loco.; track gauge 42 in.
S of M 40 comp. air mach.
PP -8 Water tube boilers; 2 air comp.
EMP—425.
Sales Agent, J. J. Riggs, Chicago, Ill.

SUPERIOR COAL CO.

General Office, Gillespie, Ill.
PR R. H. Aishton......Chicago, Ill.
TR—A. B. Jones, " "
PA—L. S. Carroll, " "
✓ **GS**—John P. Reese, Gillespie " "
CE—F. F. Jorgensen, " "
✓ **SUPT**—P. H. Shanahan..Gillespie, Ill.
MM—Roy Kentfield, " "
EE—H. L. Leekamp, " "
Asst SUPT—D. D. Wilcox, " "
No. 1 Mine; Shaft; No. 6 Ill., Seam, 7 to 8 ft. thick; operate washery.
PO—Gillespie, Ill.; **SP**—Benld, Ill; **CTY**—Macoupin; **RR**—C. & N. W.
Mine MGR—Nat. Farnsworth, Gillespie, Ill.
S of H—5 Elec. loco. and mules; track gauge 42 in.
S of M—3 Elec., 47 comp. air mach.
PP—12 Return tubular boilers total 1500 H. P., 1 gen. unit 250 volts D. C., 2 comp., 1 pump.
EMP—743. Last calendar year output 788,458 tons.
No. 2 Mine; Shaft; No. 6 Ill. Seam, 7 to 8 ft. thick; operate washery.
PO—Sawyerville, Ill.; **SP**—Benld, Ill; **CTY**—Macoupin; **RR**—C. & N. W.
Mine MGR—Tom Ferguson, Sawyerville, Ill.
S of H—5 Elec. loco. and mules; track gauge 42 in.
S of M—2 Elec., 50 comp. air mach.
PP—12 Return tubular boilers total 1500 H. P., gen. unit 250 volts D. C., 2 comp. and 1 pump
EMP—690. Last calendar year output 889,280 tons.

No. 3 Mine; Shaft; No. 6 Ill. Seam, 4 ft. 9 in. to 8 ft. thick.
PO—Gillespie, Ill.; **SP**—Benld, Ill.; **CTY**—Macoupin; **RR**—C. & N. W.
Mine MGR—John Fraser...Gillespie, Ill.
S of H—6 elec. loco. and mules. Track gauge 42 in.
S of M—Elec. mach.
PP—8 Return tubular boilers, total 1200 H. P., 2 gen. unit 250 volts D. C., 1 pump.
EMP—675. Last calendar year output 903,692 tons.

SUPERIOR COAL & MINING COMPANY.

General Office, Bellville, Ill.
Superior Mine; Shaft; No. 6 Seam; 60 to 96 in. thick
PO—Belleville, Ill; **SP**—Same; **CTY**—ST. Clair **RR**—East St. Louis & Belleville Electric.
PR—Theo. Michaelis,...Belleville Ill.
GM—Theo. Michaelis, " "
TR—Otto Michaelis, Edgemont, Ill.
S of H—Mules and 1 elec. loco. Track gauge 30 inches
S of M—10 compressed air machs.
PP—4 Brownell return tubular boilers, total 300 H. P., 1 Gen. Unit, 275 550 volts D. C., 1 pump Motor Generator Set. Power purchased.
EMP—120. Last fiscal year output, 140,000 tons.

TAYLOR COAL CO.

General Office, Chicago, Ill.
Nos. 1 and 2, Possum Ridge, Walnut Ridge Mines; Shafts No. 6 Seam, 96 to 122 in. thick; Operate Washery.
PO—Herrin, Ill.; **SP**—Same; **CTY**—Williamson; **RR**—C. B. & Q., I. C. & M. P.
✓ **PR**—H. H. Taylor........Chicago, Ill.
✓ **TR** E. H. Keeler, " "
PA—P. H. Carroll.........Herrin, "
MM—G. L. Saylor, " "
S of H—4 Elec. and 2 gasoline loco.; track gauges, 36 and 42 in.
S of M—20 Comp air mach.
PP—14 Return tubular boilers, 2 air comp.
EMP—1,100. Last fiscal year output, 700,000 tons. Sales manager, H. H. Taylor, Chicago, Ill.

TAYLOR MINING CO.

General Office, Old Colony Bldg., Chicago, Ill.
PR—P. H. Carroll........Herrin, Ill.
PA—P. H. Carroll, " "
EM—Roy Adams, " "
MM—G. L. Saylor, " "
EE—G. L. Saylor, " "
TR—John S. Reiner......Chicago, Ill.
Sales Agent, H. H. Taylor.

Possum Ridge Mine; Shaft; No. 6 Seam; 96 to 121 in. thick.
PO—Herrin, Ill.; **SP**—Same; **CTY**—Williamson; **RR**—C. B. & Q.
MS—Thomas Paul........Herron, Ill.
S of H—2 Gasoline loco. Track gauge 44 in.
S of M—20 Comp. air mach.
PP—5 return tubular boilers, total 450 H. P.

Walnut Ridge Mine; Shaft; No. 6 Seam; 96 to 121 in. thick.
PO—Herrin, Ill.; **SP**—Same; **CTY**—Williamson; **RR**—Mo. Pac., I. C.
MS—John Jeffrey..........Herrin, Ill.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—2 Return tubular boilers, total 500 H. P.
EMP—(At both mines) 200. Last fiscal year output (for both mines), 200,000 tons.

TAZEWELL COAL CO.

Tazewell Mine; Shaft; No. 5 Seam, 4 ft. 8 in. thick.
PO—Pekin, Ill.; **SP**—Same; **CTY**—Tazewell; **RR**—A. T. & S. F., C. C. C. & St. L.
GM—Jas. Duggan........Pekin, Ill.
PA—Jas. Duggan, " "
EM—M. B. Stewart, " "
S of H—Mules and 2 elec. loco. Track gauge 32 in.
S of M—12 elec. mach.
PP..5 return tubular boilers, total 500 H. P., 2 gen. units, 275 volts D. C., 2 pumps.
EMP—200. Last fiscal year output 126,000 tons.

TOLUCA COAL CO., (THE)

General Office, 1510 Commerce Bldg., Kansas City, Mo.
No. 1 Mine, Shaft, 2nd vein, 2 ft. 9 in. to 3 ft. 2 in. thick
PO—Toluca, Ill., **SP**—Same, **CTY**—Marshall; **RR**—A. T. & S. F. Ry. Main Line, C. & A. Peoria Br.
PR—G. T. Walker....Kansas City, Mo.
TR—G. T. Walker, " "
VP—C. P. A. Clough, " "
Secy—J. A. Parkinson, " "
GM—Geo. B. Gallon........Toluca, Ill.
GS—Geo. B. Gallon, " "
PA—Geo. B. Gallon, " "
EM—G. L. Humphreys, " "
EE—C. E. Arnold, " "
S of H—Mules and 5 elec. loco., track gauge 36 in.
S of M—Hand.
PP—1 pump, 11 return tubular boilers, total 1175 H. P., 1 gen. unit 250 volts, D. C.
EMP—592, Annual output 273,369 tons.
Sales Agent, Geo. B. Gallon, Toluca, Ill.

TOWER HILL COAL CO.

Shaft, No. 6 Seam, 8 ft. thick; operate washery.
PO—Tower Hill, Ill.; **CTY**—Shelby; **RR**—C. C. C. & St. L., B. & O.
PR—C. H. Bradford..Sioux City, Iowa.
GM—T. Gascoigne, Fisher Bldg., Chi., Ill
PA—H. W. Potter, " "
SM—R. A. Goodman...Tower Hill, Ill.
MM—P. J. Dooner, " "
S of M—Hand.
PP—5 Return tubular boilers.

TUXHORN COAL CO.

General Office, Springfield, Ill.
Tuxhorn Mine; Shaft; No. 5 Seam; 72 in. thick.
PO—Springfield, Ill; **SP** Keys; **CTY**—Sangammon; **RR**—C. I. & W.
PR—James W. Jefferson..Springfield, Ill.
TR—F. M. Carter, " "
GM—Norman L. Owen, " "
MINE MGR—Edw. Reese, " "
S of H—Mules and 1 elec. loco. Track gauge 42 in.
PP—2 O'Brien return tubular boilers, 1 pump.
EMP—300. Daily output 1,000 tons.

TWO RIVERS COAL COMPANY

Stripping Mine; Danville No. 7 Seam; 66 to 72 in. thick.
PO—Oakwood, Ill.; **SP**—Same; **CTY**—Vermilion; **RR**—Big Four.
PR—W. G. Hartshorn.....Oakwood, Ill.
TR—R. H. Sherwood, " "
GM—R. H. Sherwood, " "
PA—R. H. Sherwood, " "
GS—W. C. Boheman, " "
S of M—2 steam shovels.
PP—Purchase power.
EMP—75.

UBBEN COAL CO.

Ubben Mine, Shaft, No. 5 Seam, 4 ft. 6 in. to 5 ft. thick.
PO—Pekin, Ill., **SP**—Same, **CTY**—Tazewell; **RR**—C. C. C. & St. L.
PR—U. A. Ubben........Pekin, Ill.
TR—Theo. H. Ubben, " "
GM—U. A. Ubben, " "
GS—U. A. Ubben " "
PA—Theo. Ubben, " "
SR—U. A. Ubben, " "
MS—Henry Beetler, " "
S of H—Mules; track gauge 33 in.
S of M—Hand and 1 Elec. mach.
PP—1 pump, 1 return tubular boiler, total 100 H. P., also purchase power.
EMP—50. Last fiscal year output, 35,000 tons.
Sales Agent, Theo. H. Ubben, Pekin, Ill.

UNITED COAL CORPORATION

✓ General Office, Chicago, Ill.
PR—C. M. Moderwell, McCormick Bldg., Chicago, Ill.
TR—Lucius Teeter, Chicago Savings B., Chicago, Ill.
✓ **GM**—F. J. Urbain....Christopher, Ill.
MS—Edw. Allais, " "
PA—J. B. Hilton, McCormick Bldg., Chicago, Ill.
CE—J. B. Gibson......Du Quoin, Ill.
EM—J. B. Gibson, " "
MM—B. F. Lyday......Christopher, Ill.
EE—James Lindsay " "
SCO—Christopher Store Co. Buyer I. A. Price, Christopher, Ill.
Sales Agent C. M. Moderwell & Co., Chicago, Ill.

No. 1 Mine; Shaft; No. 6 Seam.
PO—Christopher, Ill.; **SP**—Same; **CTY**—Franklin; **RR**—I. C. & B.
S of H—Mules and 11 elec. locos.
S of M—20 elec. mach.
PP—7 Erie water tube boilers, total 1050 H. P., 3 gen. units, 250 volts D. C., 1 pump
EMP—500. Last fiscal year output 585,000 tons.

No. 2 Mine; Shaft; No. 6 Seam; 54 to 114 in. thick.
PO—Christopher, Ill.; **SP**—Buckner, Ill.; **CTY** Franklin; **RR**—I. C. & Burlington.
MS—Edw. Allais.......Christopher, Ill.
SM—Chas. Andrews.......Buckner, Ill.
S of H—16 elec. locos.
S of M—28 elec. mach.
PP—4 water tube boilers, total 2000 H. P., gen. and turbine, 250 volts D. C., 2 pumps.
EMP—650. Last fiscal year output 895,500 tons.

VICTORIA COAL CO.

Victoria Mine; Shaft; No. 6 Seam, 72 to 90 in. thick.
PO—Belleville, Ill.; **SP**—Same; **CTY**—St. Clair; **RR**—Ill. Cent.
PR—John Henderson.....St. Louis, Mo.
TR—L. Senior..........Belleville, Ill.
GM—L. Senior, " "
GS—L. Senior, " "
MS—W. N. Barton, " "
EE—Chas. Davis, " "
S of H—Gasoline loco.; track gauge, 36 in.
S of M—6 Comp. air mach.
PP—3 boilers, total 300 H. P., and 2 pumps.
EMP—50. Last fiscal year output, 66,762 tons. Sales manager, John Henderson, St. Louis, Mo.

WABASH COAL CO.

Out of business.

WARSAW COAL CO.

Warsaw Mine, Drift, No. 5 Seam, 53 in. thick.
PO—Edwards, Ill., **SP**—Same, **CTY**—Peoria; **RR**—C. B. & Q.
PR—H. W. Lynch........Peoria, Ill.
TR—H. W. Lynch, " "
GM—E. B. Hale, " "
PA—E. B. Hale, " "
GS—M. Cusack........Edwards, Ill.
EM—R. Taggart, " "
S of H—2 elec. locos., track gauge 34 in.
S of M—Hand.
PP—2 Return tubular boilers, total 175 H. P., 1 gen. unit, 250 volts D. C. 1 pump.
EMP—115. Last fiscal year output, 52,058 tons.
Sales Agent, H. W. Lynch, Peoria, Ill.

WASSON COAL COMPANY

General Office, Harrisburg, Ill.
✓ **PR** C. M. Wasson.....Harrisburg, Ill.
TR—C. M. Wasson, " "
GM—C. M Wasson, " "
GS—Wm. Griffin, " "
PA—J. L. Pickering, " "
Mine Mgr—Geo. Bagwell. Eldorado, Ill.
EM—I. B Craggs......Harrisburg, Ill.
MM—Stephen Zimmers, " "
SM—Val Wasson..........Wasson, Ill.

Wasson No. 1 Mine; Shaft; No. 5 Seam; 70 to 84 in thick
PO—Wasson, Ill.; **SP**—Same; **CTY**—Saline; **RR**—C. C. C. & St. L.
S of H—Mules and 5 elec. locos. Track gauge 40 in.
S of M—19 elec. mach.
PP—4 Keck, Gonnerman return tubular boilers, total 600 H. P., 3 gen. units, 250 volts D. C., 1 air comp., 2 pumps. Also purchase power.
EMP—550. Last fiscal year output 565,000 tons.

Wasson No. 2 Mine; Slope; No. 5 Seam; 54 to 59 in. thick.
PO—Carriers Mills, Ill.; **SP**—Same; **CTY** Saline; **RR**—C. C. C. & St. L.
Mine Mgr Chas. Jackson, Carriers Mills, Ill.
SM—Val Wasson..........Wasson, Ill.
S of H—5 elec. locos. Track gauge 40 in.
S of M—8 elec. mach.
PP—2 gen. units, 250 volts D. C., 1 pump. Power purchased.
EMP—250. Last fiscal year output 225,000 tons.
Sales agent, Frank Jamison, 835 Old Colony Bldg., Chicago, Ill.

WATSON COAL CO.

Nos. 1 and 2 Mines; Shaft; No. 6 Seam, 9 ft. thick.
PO—Herrin, Ill.; **SP** Same; **CTY**—Williamson; **RR**—St. I. M.
PR—W. A. Perrine......Herrin, Ill.
TR—Cistie Childress, " "
GM—W. A. Perrine, " "
PA—W. A. Perrine, " "
EM—Roy Adams, " "
S of H—Gasoline motor and mules.
S of M—Hand.
PP—Boiler 50 H. P.
Last fiscal year output 84,070 tons.

WENONA COAL CO.

Wenona No. 1, Shaft; No. 2 Seam; 2 ft. 8 in. to 5 ft. thick.

PO—Wenona, Ill.; **SP**—Same; **CTY**—Marshall; **RR**—Illinois Central, Chicago & Alton,
PR—George S. Monser....Wenona, Ill.
TR—John A. Locke, " "
GM—George S. Monser, " "
MS—George S. Monser, " "
MM—Philip Christ, " "
SCO—George S. Monser Co.; Buyer, Geo. S. Monser.
S of H—Tail rope track gauge 21 in.
S of M—Hand.
PP—7 Return tubular boilers, total 350 H. P., 2 pumps.
RR—M. O. P.
EMP—270. Last fiscal year output 132,637 tons.
Sales Agent, Wm. E. Monser.

WEST END COAL CO.

West End Mine. Shaft; No. 5 Seam, 5 ft. 10 in. to 6 ft. thick.
PO—Springfield, Ill., **SP**—Same, **CTY**—Sangamon; **RR**—B. & O., C. & N. W., Wab., C. H. D., C. & A., C. P. & St. L. & I. C.
PR—Chas. H. Hurst....Springfield, Ill.
TR—Chas. A. Starne, " "
GM—Chas. H. Hurst, " "
GS—W. F. Davis, " "
S of H—2 Elec. loco., track gauge 42 in.
S of M—Hand.
PP—1 pump, 4 return tubular boilers, total 500 H. P., 250 volts D. C.
EMP—251. Last fiscal year output, 283,000 tons.
Sales agent, P. G. Matheny, Springfield, Ill.

WEST SIDE COAL CO.

Consol Mine; Shaft; No. 7 Seam, 66 to 78 in. thick.
PO—Coulterville, Ill.; **SP**—Same; **CTY**—Randolph.
PR—Walter Heiple......Coulterville, Ill
GS—Walter Heiple, " "
MS—Walter Heiple, " "
TR—L. D. Jones, " "
GM—L. D. Jones, " "
MM—Robert Schumacher, " "
SM—M. J. Dickey, " "
EM—W. A. Reiss......Belleville, Ill
S of H—Mules.
S of M—Hand.
PP—2 Return tubular boilers, total 160 H. P., 1 pump.
EMP—76. Last fiscal year output 14,000 tons.
Sales Agency, St. Louis Coal Co., St. Louis, Mo., successors to the Underwood Coal & Mining Co.

WEST FRANKFORT COAL CO.

West Frankfort No. 1 Mine, Shaft; No. 96 to 120 in. thick.
PO—W. Frankfort, Ill.; **SP**—Same; **CTY**—Franklin; **RR**—C. & E. I., and C. B. & Q.
PR—Thos. Horn...West Frankfort, Ill.
TR—Jesse Diamond........Benton, Ill.
GM Thos. Horn...West Frankfort, Ill.
PA—Thos. Horn, " "
MS—Thos. Horn, " "
EE—August Tilliski, " "
MM—J. W. Smith, " "
EM—L. T. Putnam........Benton, Ill.
S of H—Mules and 4 elec. locos. Track gauge 42 in.
S of M—16 elec. mach.
PP—4 return tubular boilers, total, 800 H. P., 2 gen. units, 250 volts, D. C., 3 pumps.
EMP—350. Last fiscal year output 426,604 tons.
Sales Agent, Harris & Dillavon, Champaign, Ill. & St. Louis, Mo.

WEST VIRGINIA COAL COMPANY.

Ideal Mina, Shaft; No. 7 Seam; 7½ ft. thick.
PO—Marion, Ill.; CTY—Williamson;
PR—J. C. Hamilton.....Marion, Ill.
GM—Geo. A. Wallace, " "
MS—Geo. A. Wallace, " "
PA—W. H. McAlpin, " "
MM—D. N. Baker, " "
S of H—Mules anl 1 elec. loco.; track gauge 42 in.
S of M—10 Elec. mach.
PP—Water tube boilers total 450 H. P., 2 gen. units, 250 volts, D. C.; 5 pumps.
EMP—200. Last fiscal year output 248,000 tons.
Sales Agent, John Henderson, St. Louis, Mo.

(Old information.)

WESTERN COAL & MINING CO.

General Office. St. Louis, Mo.
18 Mines in Kans., Ill., Ark. and Mo.
Bush Mine No. 1, Shaft, No. 6 Seam, 7½ ft. to 6 ft. thick.
PO—Bush, Ill.; SP—Same, CTY—Williamson: RR—St. L. I. M. & S.
PR—W. J. Jenkins......St. Louis, Mo.
GM—W. J. Jenkins, " "
TR—F. M. Hickman..St. Louis, Mo.
GS—J. H. Shaw, " "
PA—D. Simpson, " "
CE—C. L. Moorman, " "
SB—J. L. Worrall, " "
MM—E. A. Carson........Hurst, Ill.
EE—J. M. Kossenjans.....Bush, Ill.
MS—A. H. Shaw, " "
SM—J. H. Pumphrey, " "
Cashier, C. L. Allan, " "
S of H—Mules and 4 elec. loco., track gauge 42 in.
S of M—Hand.
PP—8 Pumps. 5 return tubular O'Brien boilers, total 575 H. P., 2 gen. units 250 volts, D. C.
EMP—425. Annual output 294,735 tons.
Sales Agent, C. M. Snow, St. Louis, Mo.

WHITE COAL CO.

PO—R. D. Swansea, Belleville, Ill.; CTY—St. Clair.
GM—John White, 1717 West Main St.; Belleville, Ill.

WHITE COUNTY MINING & POWER CO.

General Office, 364 W. Williams St., Decatur, Ill.
Shaft Mine; No. 6 Seam; 56 to 72 in. thick.
PO—Norris City, Ill.; SP—Same; CTY—White; RR—B. & O., Big 4 branch.
PR—C. H. Hoy.........Divernon, Ill.
TR—Walter R. Kimzey, 364 W. Williams St., Decatur, Ill.
GM—F. L. Swanson....Norris City, Ill.
GS—F. L. Swanson, " "
PA—F. L. Swanson, " "
MS—H. H. Bartels, " "
EM—A. H. Sherwood....Harrisburg, Ill.
S of H—Mules. Track gauge 36 in.
S of M—2 elec. mach.
PP—1 Heilman water tube boiler, 1 Atlas return tubular boiler, total 250 H. P., 1 gen. unit, 250 volts D. C., 1 pump.
EMP—50 Last fiscal year output 33,964 tons.
Note—Successors to Norris City Coal Co.

WILLIAMSON COUNTY COAL CO.

General Office, Equitable Bldg., St. Louis, Mo.
Black Brier Mine; Shaft, No. 7 Seam, 84 to 120 in. thick.
PO—Johnston City, Ill.; SP—Same; CTY—Williamson; RR—C. & E. I.
PR—Louis F. Lumaghi, St. Louis, Mo.
GM—Jos. D. Lumaghi, " " "
PA—A. C. Powell,...Johnston City, Ill.
GS—William Ruff, " " "
MS—William Ruff, " " "
EM—A. C. Powell, " " "
MM—Jos. Rapp, " " "
S of H—Elec. motors and mules; track gauge, 26 in.
S of M—Hand.
PP—4 Return tubular boilers, total 800 H.P., gen. unit, 150 volts; 4 pumps.
EMP—250. Last fiscal year output, 200,000 tons.
Sales Agent, J. J. O'Donnell, St. Louis, Mo.

WILLIS COAL & MINING CO.

General Office, 710 Fullerton Bldg., St. Louis, Mo.
PR—E. J. Krause, Fullerton Bl., St. Louis, Mo.
TR—E. J. Krause, Fullerton Bl., St. Louis, Mo.
GM—C. H. Krause, " "
PA—H. H. Schroeder, " "
EM—A. K. Stewart....Willisville, Ill.
GS—Thos. Jeremiah, " "
EE—W. H. Pool...........Perry, Ill.
Sales agent, W. T. Steger, St. Louis, Mo.

Willis No. 1, Shaft, No. 6 Seam, 5 to 6 ft. thick.
PO—Willisville, Ill., SP—Same, CTY—Perry; RR—M. & O.
MS—David Hopkins....Willisville, Ill.
S of H—4 Elec. loco.; track gauge 36 in.
S of M—6 Elec. mach.
PP—1 Air comp., 4 pumps, 5 water tube O'Brien boilers, total 750 H. P., 200 K. W., 250 volts D. C.
EMP—208. Annual output 236,602 tons.

Goalby No. 6 Mine; Shaft; No. 6 Seam; 5 to 7 ft. thick.
PO—Percy, Ill., SP—Same, CTY—Randolph; RR—M. & O.
MS—W. Flynn............Percy, Ill.
S of H—5 elec. loco. Track gauge 36 in.
S of M—10 Elec. mach.
PP—1 Air comp., 2 pumps, 4 O'Brien. water tube boilers, total 600 H. P., 150 K. W., 250 volts, D. C.
EMP—227. Annual output 290,770 tons.

WILMINGTON COAL MINING & MANFG. CO.

Mine, Shaft, No. 2 Seam, 3½ to 4½ ft. thick.
PO—Torino, Ill., SP—Caster, Ill., on E. J. & E., and Braceville, Ill., on C. & A.; CTY—Williamson.
PR—Geo. Gray.......Columbus, Ohio
TR—L. J. Buckley.......Chicago, Ill.
GM—L. J. Buckley, " "
PA—L. J. Buckley, " "
GS—Alex. Skinner.......Torino, Ill.
EM—John McVicar, " "
MM—Frank Dondanville,... Torino, Ill.
MS—John Skinner, " "
SCO—Skinner Bros., Buyer, David Skinner, Torino, Ill.
S of H—Mules; track gauge 28 in.
S of M—Hand.
PP—3 water tube boilers, total 750 H. P., 2 pumps.
EMP—220. Last fiscal year output 66,973 tons.

WILMINGTON STAR MINING CO.

General Office, Chicago, Ill.
Nos. 6 and 7 Mines; Shaft; No. 2 Seams, 3 ft. thick; operate washery.
PO—Coal City, Ill.; SP—Same; CTY—Grundy; RR—E. J. & E., C. & A., A. T. & S. F.
PR—Gordon Buchanan....Chicago, Ill.
TR—D. W. Buchanan, " "
PA—P. W. Beda......Chicago, Ill.
MS—Hugh Miller......Coal City, Ill.
SM—H. A. Campbell, " "
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—12 Return tubular boilers.
EMP—(7) 250. (No. 6) Idle since July, 1913. Last fiscal year output 103,300 tons.
Sales Agency, Buchanan Coal Co., Minneapolis, Minn., Omaha, Neb., and Chicago, Ill.

WILSON BROS. COAL CO.

Eden Mine, Shaft; No. 6 Seam; 5 to 6 ft. thick.
PO—Sparta, Ill.; SP—Same; CTY—Randolph; RR—M & O.
PR—T. B. Stephenson....Sparta, Ill.
PA—Carl C. Stephenson, " "
GM—C. H. Krause, 710 Fullerton Bldg., St. Louis, Mo.
GS—Thos. Jeremiah....Willisville, Ill.
MS—John Petty..........Sparta, Ill.
S of H—1 Elec. loco.; track gauge 29¼ in.
S of M—4 Elec. mach.
PP—2 Brownell return tubular boilers, total 300 H. P., 1 gen. unit, 250 volts, D. C.

WILSON COAL CO.

Galum Mine; Shaft; No. 6 Seam; 66 to 78 in. thick.
PO—Cutler, Ill.; SP—Same; CTY—Perry; RR—W. C. & W.
GM—Alex. M. Wilson..Mt. Vernon, Ill.
PA—Alex. M. Wilson, " "
MS—Alex. M. Wilson, " "
S of H—Mules.
S of M—Hand.
PP—2 return tubular boilers, total 160 H. P., 5 gen. units, 2 engines and 2 pumps.
EMP—30. Last fiscal year output 36,000 tons.

WOLSCHLAG CO-OPERATIVE COAL CO.

Seam 48 in. thick.
PO—Peoria, Ill.; SP—S. Bartonville, Ill.; CTY—Peoria; RR—P. & P., W. P. R. T.
PR—G. A. Ditewig.........Peoria, Ill.
GM—G. A. Ditewig, " "
TR—Jas. F. McElwee, " "
S of H—3 elec. loco. and mules.
S of M—Hand.
PP—Elec., 2 pumps. Power purchased.

WOODSIDE COAL CO.

Woodside Mine, Shaft, No. 5 Seam, 5 ft. 10 in. thick.
PO—Springfield, Ill.; SP—Same; CTY—Sangamon; RR—Wabash.
PR—Stuart Brown .... Springfield, Ill.
TR—Stuart Brown, " "
GM—Stuart Brown, " "
PA—H. Brown, " "
MS—Robt. Wilson, " "
S of H—2 Elec. loco., track gauge 3 ft. 8 in.
S of M—Hand.
PP—4 Springfield return tubular boilers, total 400 H. P., 2 gen. units, 500 volts, D. C., 2 pumps.
EMP—380. Last fiscal year output 322,000 tons.
Sales Agent, H. J. Dudley, Springfield Ill.

(Old information.)

WYOMING MINING CO.

No. 1 Mine; Shaft; No. 6 Seam, 4¾ ft. thick.
PO—Wyoming, Ill.; SP—Same; CTY—Stark; RR—C. B. & Q.
GM—James Highbee....Wyoming, Ill.
PA—James Highbee, " "
EM—L. C. Highbee, " "
MS—L. C. Highbee, " "
S of H—Mules.
S of M—Hand.
PP—3 Boilers.

INDIANA

For List of Abbreviations See Page 622.

AMERICAN COAL MINING COMPANY.

General Office, Brazil, Ind.
Mine No. 1, Shaft; No. 5 Seam; 81 to 100 in. thick.
PO—Bicknell, Ind.; SP—Same; CTY—Knox; RR—Vandalia Ry.
PR—W. M. Zeller........Brazil, Ind.
TR—W. J. Snyder, " "
GM—H. G. Conrad......Bicknell, Ind.
PA—H. G. Conrad, " "
MS—P. C. Conrad, " "
S of H—9 elec. locos.; track gauge 42 in.
S of M—15 elec. mach.
PP—4 Heine water tube boilers, toal 1224 H. P., gen. units, 440 volts A. C., 60 cycles.

AMERICAN SEWER PIPE CO.

2 Mines in Ohio and 1 in Indiana.
General Office, Akron, O.
PR—Geo. R. Hill........Akron, Ohio
TR—A. S. McCombe, " "
GM—A. S. McCombe, " "
PA—B. J. Hill..........Akron, Ohio
CE—R. H. Russell, " "
EM—R. H. Russell....Akron Ohio.
MM—W. H. Rook, " "
SM—B. J. Hill............Akron, O.

American Sewer Mine; Shaft and Stripping, Seam 40 to 48 in. thick.
PO—Brazil, Ind.; SP—Same; CTY—Clay; RR—C. and E. I.
MS—Frank C. Carnahan...Brazil, Ind.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—3 boilers, 1 gen. unit, 110 volts D. C., 3 pumps.
EMP—40. Last fiscal year output 50,000 tons.
Consume output.

ARCHBOLD, JOHN, COAL CO.

General Office, Evansville, Indiana.
1 Mine in Indiana and one in Kentucky.
Red Shaft Mine; Shaft; No. 9 Seam, 50 in. to 53 in. thick.
PO—Newburgh, Ind., SP—Same, CTY—Warwick; RR—E. S. & N.
PR—John Archbold....Evansville, Ind.
TR—V. D. Herrenbruck..Evansville, Ind.
GM—John Archbold, " "
PA—John Archbold, " "
GS—Edmund Archbold..Newburgh, Ind.
EM—Wm. Abshire......Newburgh, Ind.
S of H—Mules; track gauge 36 in.
S of M—Hand.
EMP—100. Last fiscal year output, 40,741 tons.

AYRDALE COAL CO.

Ayrdale Mine; Shaft; No. 4 Seam; 52 to 60 ins. thick.
PO—Jasonville, Ind.; SP—Same; CTY—Greene, RR—C. T. H. & S. E.
PR—W. J. Freeman..Terre Haute, Ind.
GM—J. B. Schloot........Linton, Ind.
PA—J. B. Schloot, " "
TR—J. B. Schloot, " "
GS—J. B. Schloot, " "
MS—W. S. James......Jasonville, Ind.
S of H—2 elec. loco. Track gauge 42 in.
S of M—10 elec. mach.
PP—3 water tube boilers, total 400 H. H., 2 pumps.
EMP—250. Last fiscal year output 186,000 tons.

AYRSHIRE COAL CO.

General Office, Oakland City, Ind.
PR—David Ingle..Oakland City, Ind.
TR—David Ingle....Oakland City, Ind.
GM—W. D. Ingle, " "
PA—W. D. Ingle, " "
EM—R. N. Jackson..Oakland City, Ind.
GS—J. W. Powell......Winslow, Ind.
EE—Walter Jenkins......Winslow, Ind.
MM—C. H. Burbank, Oakland City, Ind.
SCO—Ingle Supply Co., Buyer Cal Whitman, Oakland City, Ind.

No. 7 Mine; Shaft; No. 5 Seam, 5 to 7 ft. thick. Operate washery.
PO—Oakland City, Ind.; SP—Ayreshire, Ind.; CTY—Pike; RR—Sou; Louisville & St. Louis Div.
MS—Wm. Barrowman....Winslow, Ind.
S of H—8 elec. locos.; track gauge 36 in.
S of M—12 elec. mach.
PP—4 Erie return tubular boilers, total 600 H. P., 2 gen. units, 250 volts D. C., 7 elec. pumps.
EMP—250. Last fiscal year output 218,222 tons.

No. 5 Mine;; Slope; No. 5 Seam 58 to 66 in. thick.
PO—Oakland City, Ind.; SP—Ayrshire; CTY—Pike; RR—Sou; Louisville & St. Louis Div.
MS—John Jennings......Winslow, Ind.
S of H—2 Elec. loco. and mules; track gauge 36 in.
S of M—3 Elec. mach.
PP—1 M. G. Set, 250 volts D. C., 440 A. C., 3 phase, 6 cycles, 3 pumps, power purchased.
EMP—75. Last fiscal year output 27,737 tons.

No. 4 Mine; Drift; Ind. No. 5 Seam, 56 to 70 in. thick; operate washery 20 tons capacity.
PO—Oakland City, Ind.; SP—Ayrhire; CTY—Pike; RR—Sou; Louisville & St. Louis Div.
MS—Geo. Briggs........Winslow, Ind.
S of H—3 Elec. loco. and mules; track gauge 36 in.
S of M—7 Elec. mach.
PP—2 M. G. Sets, 250 volts D. C., 4 elec. pumps, power purchased.
EMP—165. Coke ovens 30 Bee Hive. Last fiscal year output 90,248 tons.

BICKNELL COAL & MINING CO.

Bicknell Mine; Shaft; No. 5 Seam, 54 to 96 in. thick.
PO—Bicknell, Ind. SP—Same. CTY—Knox; RR—Vandalia.
PR—J. C. Cox.........Bicknell, Ind
MS—T. M. Byers, " "
GS—T. M. Byers, " "
TR—C. E. Freeman, " "
PA—C. E. Freeman, " "
EM—Rush & Everson...Terre Haute, Ind.
S of H—Mules track gauge 36 in.
S of M—8 Elec. mach.
PP—3 return tubular boilers, total 450 H. P., 2 pumps.
EMP—214. Last fiscal year output 230,336 tons.

BIG FOUR COAL CO.

Big Four No. 3 Mine; Slope; No. 5 Seam, 60 to 90 in. thick.
PO—Boonville, Ind.; SP—Same; CTY—Warrick; RR—Sou., St. Louis Div.
PR—George P. Nester, Boonville, Ind.
GM—George P. Nester, " "
TR—J. F. Heinzle, " "
GS—John E. Kelly, " "
PA—John E. Kelly, " "
CE—John E. Kelly, " "
MM—D. La Foon, " "
MS—John O'Laughlin, " "
S of H—1 Elec. loco. and mules; track gauge 36 in.
S of M—2 elec. and 4 comp. air mach.
PP—3 Return tubular boilers, total 450 H. P., gen. units, 250 volts D. C., 4 pumps, 1 air comp.
EMP—100. Last fiscal year output 92,490 tons.

BIG VEIN MINING CO.
Big Vein Mine, Shaft, No. 5 Seam, 7½ to 11 ft. thick.
PO—Coalmont, Ind. SP—Same. CTY—Clay. RR—C.T.&S.E.
PR—W. W. Ray, .. Terre Haute, Ind.
GM—W. W. Ray, " " "
TR—W. L. Williamson..Terre Haute, Ind.
PA—W.L. Williamson, " " "
S of H—Mules. Track gauge 36 in.
S of M—12 comp. air machines.
PP—3 Return tubular boilers, total 310 H. P., 2 air compressors, 1 pump.
EMP—250. Last fiscal year output 180,000 tons.
(Old information.)

BOGLE, W. S. & CO., INC.
General Office, 343 S. Dearborn St., Chicago, Ill.
W. S. Bogle Nos. 1 and 2 Mines; Shafts; Nos. 4 and 5 Seams, 56 to 60 in thick.
PO—Terre Haute, Ind. SP—Blandford. CTY Vigo; RR C. T. H. & S. E.
PR—W.S. Bogle, ... Chicago, Ill.
GM—W. S. Bogle, " "
GS—Philip Roberts, ..Terre Haute, Ind.
MS—Philip Roberts, " "
PA—Philip Roberts, " "
EE—R. B. Colman, " "
TR—H.A. Stark, " "
S of H—3 elec. loco. and 4 storage battery locos. Track gauge 42 in.
S of M—Hand.
PP—6 Brownell & Erie return tubular boilers, total 900 H.P., 2 gen. units, 250 volts D.C., 2 pumps.
New mines.

BOONE COAL CO.
General Office, Boonville, Ind.
John Bull Mine; Shaft; No. 5 Seam, 60 to 84 in. thick.
PO—Boonville, Ind.; SP—Same; CTY—Warrick; RR—Southern.
PR—Chas. Baughn......Boonville, Ind.
TR—Wm. Husk, " "
GM—Clem E. Doane, " "
GS—Clem E. Doane, " "
PA—Clem E. Doane, " "
MS—Lon Shaw, " "
MM—Lon Shaw, " "
S of H—Mules; track gauge, 42 in.
S of M—10 Comp. air machines.
PP—2 Brownell return tubular boilers, total 300 H. P., 2 pumps, 1 air comp.
EMP—100. Last fiscal year output 60,000 tons.

BRAZIL COLLIERIES CO.
Brazil Collieries No. 1 Mine, Shaft, Semi-Block, 4 ft. to 4 ft. 3 in. thick.
PO—Brazil, Ind.; SP—Billtown, Ind.; CTY—Clay.; RR—C. & E. I.
PR—A. L. Allais.........Chicago, Ill.
TR—Wm. M. Zeller, ... Brazil, Ind.
GM—Thos. F. Grant, " "
PA—Thos. F. Grant, " "
MS—George Myers........Brazil, Ind.
S of H—Mules.
S of M—Hand.
PP—2 Union City Water Tube Boilers, 2 pumps.
EMP—85. Last fiscal year output 70,000 tons.

BRYAN, JOS. A., COAL CO.
General Office, Evansville, Ind.
Chandler Mine, Shaft, No. 5 Seam, 4½ to 6 ft. thick.
PO—Chandler, Ind. SP—Same. CTY—Warrick. RR—Southern.
PR—J.A. Bryan, .. Evansville, Ind.
GM—J.A. Bryan, " "
PA—J.A. Bryan, " "
MS—Chas. Lay, " "
EM—Jas. H. Klee, " "
S of H—Mules. Track gauge 41 in.
S of M—Hand and 6 Comp. air mach.
PP—4 retun tubular boilers, total 300 H.P., 1 air comp., 1 pump.
EMP—75. Last fiscal year output 54,640 tons.
(Old information.)

BUGG, T. C., COAL CO.
Shaft Mine; No. 5 Seam; 48 to 81 in. thick.
PO—Oakland City, Ind.; SP—Same; CTY—Gibson; RR—C. & E. I.
PR—T. C. Bugg.....Oakland City, Ind.
TR—Floyd Murphy, " "
GM—Floyd Murphy, " "
PA—Floyd Murphy " "
MS—J. C. Anderson, " "
SCO—Massey Merc. Co. Buyer, Thos. Howard, Oakland City, Ind.
S of H—Mules. Track gauge 38 in.
S of M—3 elec. mach.
PP—2 return tubular boilers, total 200 H. P., 220 volts A. C., 3 phase, 60 cycles.

BUNSEN COAL CO.
General Office, So. La Salle St., Chicago, Ill.
1 Mine in Indiana, 3 Mines in Illinois.
PR—W. H. Clingerman, Carnegie Bldg., Pittsburgh, Pa.
TR—C. S. Wardley......Chicago, Ill.
Secy—C. S. Wardley, " "
PA—J. C. Hoot, " "
GS..Thomas Moses.......Westville, Ill.
EM—A. F. Allard. " "
Universal Mine; Shafts; Nos. 4 and 5 Seams; 48 to 60 in. thick.
PO—Universal, Ind.; SP—Clinton, Ind.; CTY—Vermillion; RR—C. & E. I.
MS—Thos. Cokeley......Universal, Ind.
S of H—3 Elec. loco. and 2 storage batteries; track gauge 42 in.
S of M—19 Elec. mach.
PP—4 Water tube boilers, total 1496 H. P., 3 gen. units D. C., 2 pumps.

CALEDONIA MINING CO.
General Office, 2938 Port ave., Louisville, Ky.
Turkey Knob Mine; Drift; No. 5 Seam; 48 to 60 in. thick.
PO—Winslow, Ind.; SP—Hartwell Jct.; CTY—Pike; RR—Southern, Hartwell branch.
PR—Edw. J. Hackett.....Louisville, Ky.
TR—Edw. J. Hackett, " "
GM—Edw. J. Hackett, " "
PA—Edw. J. Hackett, " "
GS—Chas. Wilder,
R. F. D. No. 20, Winslow, Ind.
SCO—D. J. Mackey Co. Buyer, R. D. Nicholson, Louisville, Ky.
S of H—2 elec. locos.
S of M—3 elec. mach.
PP—2 return tubular boilers, total 300 H. P., 2 gen. units, 3 pumps.
EMP—50.
Caledonia Mine worked out.

CALORA COAL COMPANY.
General Office, Terre Haute, Ind.
Calora Mine, Shaft, Fourth Seam, 5 to 4½ ft. thick.
PO—Jasonville, Ind. SP—Same. CTY—Greene. RR—C.T.H.&S.E.
GM—C.H. Jones, ..Terre Haute, Ind.
PA—C.H. Jones, " " "
S of H—2 elec. loco. Track gauge 42 in.
S of M—9 Elec. machines.
PP—4 Water tube boilers, total 800 H. P., 1 generating unit. 250 volts D.C., 1 air comp., 3 pumps.
EMP—150. Last fiscal year output 200,000 tons.

CHICAGO-CARLISLE COAL CO.
Carlisle Mine; Shaft; No. 5 Seam; 56 to 68 in. thick.
PO—Carlisle, Ind. SP—Same. CTY —Sullivan. RR—C.&E.I.
PR—G. A. Van Dyke,
1217 Fisher Bldg., Chicago, Ill.
TR—W. A. Patterson.
1217 Fisher Bldg., Chicago, Ill.
MS—W. F. Dodge, ... Carlisle, Ind.
PA—W.F. Dodge, " "
EM—Joe Stievenart........Brazil, Ind.
S of H—Mules, and 1 elec. loco., track gauge 36 in.
S of M—Hand.
PP—2 Atlas return tubular boilers, total 500 H. P., gen. unit, 250 volts, D. C. and 1 pump.
EMP—140. Last fiscal year output 120,000 tons.
Sales agent, Harrisburg-Franklin Coal Co., 1217 Fisher Bldg., Chicago, Ill.

CLAY COUNTY BLOCK COAL COMPANY.
General Office, Terre Haute, Ind.
Monkey Mine; Shaft; Semi-block Seam; 3 ft. 6in to 6 ft. thick.
PO—Coal Bluff, Ind. SP—Same. CTY Vigo. RR—C.&E.I.
PR—John J. Shea....Terre Haute, Ind.
GM—John J. Shea, " "
PA—John J. Shea, " "
TR—F. O. Froeb....Terre Haute, Ind.
EM—Rush & Everson, " "
GS—Ralph Sharpe....Farmersburg, Ind.
MS—Ralph Sharpe, " "
S of H—Mules and rope; track gauge 36 in.
S of M—Hand.
PP—2 return tubular boilers, total 160 H.P., 1 pump.
EMP—130. Last fiscal year output 80,400 tons Sales agent, John J. Shae, Terre Haute, Ind.

CLAY PRODUCTS CO., THE
Clay Product Mine, Stripping, Brazil Block Coal Seam, 3½ ft. to 4 ft. 2 in. thick.
PO—Brazil, Ind. SP—Same. CTY —Clay. RR—Vandalia.
PR—H. H. Titsworth, " "
Lencke Annex, Indianapolis, Ind.
TR—J. R. Jones.
Lencke Annex, Indianapolis, Ind.
PA—Chas. F. Shannon,.. Brazil, Ind.
GS—Chas. F. Shannon,
MS—Samuel Holden........Brazil, Ind.
MM—J. E. Hixon, " "
S of H—1 steam loco. Standard RR track gauge.
S of M—Steam shovel.
PP—3 return tubular boilers, total 300 H.P., 3 engines.
EMP—30. Last fiscal year output 60,000 tons. Sales Mgr., F. A Rogers, Indianapolis, Ind.

CLINTON COAL CO.
General Office, Clinton, Ind.
PR—H. C. Dies..........Clinton, Ind.
TR—S. C. Stultz, " "
GM H. M. Ferguson. " "
PA—H. M. Ferguson, " "
GS—Arthur Ferguson, " "
EM—Cecil Harrison, " "
EE—Howard Hughes, " "

Crown Hill No. 2 Mine; Shaft; No. 5 Seam; 56 in. thick.
PO—Clinton, Ind.; SP—Same; CTY—Vermillion; RR—C. & E. I.
MS—A. Ferguson.........Clinton, Ind.
S of H—Mules and 2 elec. loco. Track gauge 35 in.
S of M—Hand.
PP—4 Erie return tubular boilers, total 600 H. P., 1 gen. units, 250 volts D. C., 1 pump and 1 air Comp.
EMP—245. Last fiscal year output 126,164 tons.

Crown Hill No. 3 Mine; Shaft; No. 3 Seam; 70 to 78 in. thick.
PO—Clinton, Ind.; SP—Same; CTY—Vermilion; RR—C. & E. I.
MS—A. Ferguson........Clinton, Ind.
S of H—5 elec. locos. Track gauge 42 in.
S of M—8 elec. mach.
PP—6 return tubular boilers, total 900 H. P.
EMP—235. Last fiscal year output 124,903 tons.

Crown Hill No. 4 Mine; Shaft; No. 4 Seam; 48 to 52 in. thick.
PO—Clinton, Ind.; SP—Same; CTY—Vermilion; RR—C. & E. I.
MS—A. Ferguson........Clinton, Ind.
S of H—5 elec. locos. Track gauge 42 in.
S of M—Hand
PP—4 Erie return tubular boilers, total 600 H. P., 1 gen. unit, 250 volts D. C., 1 pump.
EMP—250. Last fiscal year output 166,002 tons.

Crown Hill No. 5 Mine; Shaft; No. 5 Seam, 56 in. thick.
PO—Clinton, Ind.; SP—W. Clin. CTY—Vermilion; RR—C. T. H. & S. E.
MS—W. F. Brown.......Clinton, Ind.
S of H—Mules.
S of M—Hand.
PP—2 return tubular boilers. total 300 H. P., 1 pump.
Note—Idle at present.

Crown Hill No. 6 Mine; Shaft; No. 5 Seam; 56 in. thick.
PO—Clinton, Ind.; SP—West Clinton; CTY—Vermilion; RR—C. T. H. & S. E.
MS—W. F. Brown,...... Clinton, Ind.
S of H—Mules
S of M—Hand.
PP—2 return tubular boilers, total 300 H. P., 1 pump.
EMP—175. Last fiscal year output 104,198 tons.

COAL BLUFF MINING CO.
Plymouth No. 2 Mine.
PO—Terre Haute, Ind. SP—Same. CTY—Vigo. No report.

CONSOLIDATED INDIANA COAL CO.
Stewart K. Smith, St. Louis, Mo., receiver, 343 S. Dearborn St., Chicago, Ill.
GM—Btewart K. Smith....Chicago, Ill.
PA—H. E. Rhein. " "
GS—Walter E. Guller, Sullivan, Ind.
Sales agency, Chicago, Ill., office.

Glendora, Indiana, No. 26 mine, Shaft, No. 6 Seam; 65 ins. thick.
PO—Sullivan, Ind.; SP—Shelburn, Ind.; CTY—Sullivan; RR—C. T. H. & S. E.
S of H—Mules and rope. Track gauge 38 in.
S of M—8 comp. air mach.
PP—2 Erie and 2 Atlas return tubular boilers; 1 gen. unit; 275 volts D. C., 1 pump.
EMP—175. Last fiscal year output 38,742 tons.

St. Clair Indiana No. 30, Shaft, No. 6 Seam. 66 ins. thick.
PO—Shelburn, Ind.; SP—Hart Station, Ind.; CTY—Sullivan; RR—C. T. H. & S. E.
S of H—Mules, 1 elec. and 1 gasoline loco. Track gauge 38 in.
S of M—Hand and 5 elec. mach.
PP—2 Erie, 1 Hanler and 1 Hansell-Elcock return tubular boilers; 1 gen. unit, 250 volts D. C.; 1 pump.
EMP—100. Last fiscal year output 159,582 tons.

Peerless, Ind., No. 27 Mine; Shaft; No. 6 Seam; 68 in. thick.
PO—Sullivan, Ind.; SP—Seifert, Ind.; CTY—Sullivan; RR—C. & E. I.
S of H—Mules, 1 elec. and 1 gasoline loco. Track gauge 38 in.
S of M—15 elec. mach.
PP—2 Hanler, 1 Erie and 1 Atlas return tubular boiler, 2 gen. units. Total 500 volts D. C., 1 pump.
EMP—300. Last fiscal year output 81,858 tons.

CORNELIUS COAL COMPANY
PR J. H. Cornelius....Bicknell, Ind.
GM—J. H. Cornelius, " "
GS—J. H. Cornelius, " "
PA—J. H. Cornelius, " "
Note—Not yet started.

CRAWFORD COAL CO.
General Office Brazil, Ind.
PR—John L. Crawford, Terre Haute, Ind.
TR—Jas. J. Bucklin.......Brazil, Ind.
PA—Jas. J. Bucklin, " "
MS—William Spears, " "
EE—Victor Vandivor. " "

No. 12 Mine; Shaft; Indiana Block Coal Seam; 30 to 52 in. thick.
PO—Brazil, Ind.; SP—Same; CTY—Clay; RR—C. & E. I.
S of H—Mules.
S of M—5 elec. mach.
PP—2 return tubular boilers, total 150 H. P., 1 gen. unit, 2 pumps.

No. 14 Mine; Shaft; Indiana Block Coal Seam; 30 to 52 in. thick.
PO—Brazil, Ind.; SP—Same; CTY—Clay; RR—C. & E. I.
MS—William Pens.........Brazil, Ind.
S of H—Mule.
PP—3 water tube boilers, total 150 H. P., 2 gen. units, 1 air compressor, 2 pumps.

CRESCENT COAL COMPANY.
Crescent Mine, Shaft, No. 5 Ind. or No. 9 Kentucky Seam, 4 ft. 2 in. to 4 ft. 8 in. thick.
PO—Evansville, Ind. SP—Same. CTY—Vanderburg. RR—I.C., Evansville Belt.
PR—Jas. H. Moore, . Evansville, Ind.
GM—Jas. H. Moore, " "
PA—Jas. H. Moore, " "
TR—P. F. Herbert, " "
GS—J. N. Retlinger, " "
MS—Fred Sutheimer....Evansville, Ind.
EE—T. J. Phillips, " "
S of H—3 elec. locos. Track gauge, 39 in.
S of M—Hand.
PP—3 water tube boilers, total 450 H. P., 2 generating units, 220 volts D.C., 1 pump.
EMP—230. Last fiscal year output 135,000 tons. Sales agent Jas. H. Moore, Evansville, Ind.

CROW CREEK COAL MINING CO.
Husky Mine; Shaft; No. 5 Seam, 58 to 76 in. thick.
PO—Boonville, Ind.; SP—Same; CTY—Warrick; RR—Sou.
GM—Wm. Gough, ...Boonville, Ind
S of H—Mules.
S of M—1 Elec. mach.
PP—Power purchased.

CYPRESS CREEK COAL CO.
Leased to Boone Coal Co.

DAVIESS COUNTY COAL COMPANY.
No. 4 Mine, Shaft, No. 4 Seam.
PO—Washington, Ind. SP—Montgomery. CTY—Daviess. RR—B. & O. S. W.

GM—C. C. Martin, .. Washington, Ind.
MS—E. K. Sudduth, " "
S of H—Mules.
S of M—Hand.
PP—2 boilers, total 300 H.P.
EMP—100.

DeCAMP BLOCK COAL & CLAY CO. THE
Out of business.

DEEP FOURTH VEIN COAL CO., (Lessee)
General Office, Terre Haute, Ind.
PR—Robert J. Smith, Terre Haute, Ind.
TR—John M. Mauson, " " "
GS—Bruce Jeffers, West " " "
EE—Wm. Lovett, " " " "

Deep Vein Mine, Shaft, No. 4 Seam, 4½ to 5½ ft. thick
PO—W. Terre Haute, Ind. SP—Macksville, Ind. CTY—Vigo. RR—Vandalia. Macksville North Br.
MS—Chas. Hill, W. Terre Haute, Ind.
S of H—2 elec. loco. and mules. Track gauge 36 in
S of M—7 elec. mach.
PP—4 return tubular boilers, total 600 H.P., 2 gen. units 500 volts D. C., 1 pump.
EMP—275. Last fiscal year output 263,000 tons.

DERING, J. K. COAL CO.
General Office. Chicago, Ill.
PR—J. K. Dering.......Chicago, Ill.
TR—J. E. Ford, " "
PA—J. E. Ford. " "
GS—D. B. M dill........Clinton, Ind.
EM—H. A. Brymer, " "
EE—A. H. Jackson, " "

Oak Hill No. 1 Mine; Shaft; No. 3 Seam; 72 to 78 in. thick.
PO—Clinton, Ind ; SP Same; CTY—Vermilion; RR—C. & E. I.

(Continued on Next Page.)

Dering, J. K. Coal Co.—Cont.
MS—Frank Neese........Clinton, Ind.
S of H—Mules and 6 elec. locos. Track gauge 42 in.
S of M—24 elec. machs.
PP—2 gen. units, 450 K. W., 2300 volts A. C. and 250 volts D. C., 1 pump. Power purchased.
EMP—340. Last fiscal year output 300,577 tons.

No. 6 Mine; Shaft; No. 4 Seam; 63 to 68 in. thick.
PO—Clinton, Ind.; SP—Same; CTY—Vermilion; RR—C. & E. I.
MS—William Wilson......Clinton, Ind.
S of H—Elec. loco. Track gauge 42 in.
S of M—Hand.
PP—2 Erie, 1 Terre Haute return tubular boilers, 1 pump. Also purchase power.
Note—Just commencing development work.

No. 8 Mine; Shaft; No. 4 Seam; 52 to 59 in. thick.
PO—Clinton, Ind.; SP—Same; CTY—Vermilion; RR—C. & E. I.
MS—John Lindsay........Clinton, Ind.
S of H—Mules and 5 elec. loco. Track gauge 37 in.
S of M—Hand.
PP—2 Erie, 2 Chandler and 1 Brownell return tubular boilers, total 750 H. P., 1 pump.
EMP—425. Last fiscal year output 323,824 tons.

DIAMOND COAL CO.
Diamond Mine, Shaft, Seam 4 ft. thick.
PO—Evansville, Ind. SP—Same. CTY—Vanderburg.
PR—Adolph B. Schmidt, Evansville, Ind.
TR—Gus B. Mann, " "
GM—Raymond N. Lannert, Evansville, Ind.
PA—Raymond N. Lannert, " "
MS—Pius Schultheis, " "

S of H—Mules. Track gauge 3 ft.
S of M—Hand.
PP—3 Return tubular boilers, total 180 H.P.
EMP—90.

EHRLICH-PIERCE MINING CO.
Out of business.

ELBERFELD CO-OPERATIVE COAL CO.
Shaft Mine, Seam No. 5, 48 to 74 in. thick.
PO—Elberfeld, Ind.; SP—Same; CTY Warrick; RR—C. & E. I.
PR—C. A. Wiggs, ...Elberfeld, Ind.
GM—C. A. Wiggs, " "
GS—C. A. Wiggs, " "
PA—C. A. Wiggs, " "
CE—F. M. Nelson....Elberfeld, Ind.
TR—Albert Bleckman " "
S of H—Mules and gasoline loco.
S of M—Hand.
PP—2 Atlas return tubular boilers, total 260 H. P., 2 pumps.
EMP—50.
Sales Agent, W. M. Stephenson, Indianapolis, Ind.

ERIE CANAL COAL CO.
General Office, Boonville, Ind.
Erie Canal Mine, Shaft, No. 5 Seam, 5 to 6 ft. thick.
PO—Chandler, Ind. SP—Same. CTY — Warrick. RR—Southern.
PR—T.D. Scales, ...Boonville, Ind.
GM—T. D. Scales, " "
PA—T.D. Scales " "
TR—W.F. Weyesbacher, " "
MS—W.W. Deane, .. Chandler, "
S of H—Mules and locos. Track gauge 36 in.
S of M—5 elec. machines.
PP—3 Erie horizontal tubular boilers, 1 generating unit, 2 pumps.
EMP—88. Last fiscal year output 78,175 tons.

EUREKA BLOCK COAL CO.
Eureka No. 5 Mine.
PO—Terre Haute, Ind. SP—Same. CTY Vigo. No report.

FORSCHNER, T. J., COAL CO.
Sponsler Mine, Stripping, Linton No. 4 Seam, 54 to 66 in. thick.
PO—Linton, Ind. SP—Same. CTY—Greene. RR—C. T. H. & S. E.
PR—T. J. Forschner, 39 Glen Ave., Mt. Vernon, N.Y.
TR—Wm. P. Forschner....Linton, Ind.
GM—T.J. Forschner, 39 Glen Ave., Mt. Vernon, N. Y.
GS—Wm. P. Forschner....Linton, Ind.
PA—Wm. P. Forschner....Linton, Ind.
MS—L. L. Drown........Linton, Ind.
S of H—3 steam locos. Track gauge 36 in.
S of M—2 steam shovels.
PP—1 air comp. and 2 pumps.
EMP—40. Last fiscal year output 80,000 tons.

FORT BRANCH COAL MINING CO.
Fort Branch Mine, Shaft, No. 5 Seam 66 to 78 in. thick.
PO—Fort Branch, Ind. SP—Same. CTY—Gibson. RR—C.&E.I.
PR—W. A. Jackson.....Princeton, Ind.
GM—W. A. Jackson, " "
PA—W. A. Jackson, " "
MS—Jess Bolin......Ft. Branch, Ind.
EE—J. H. Hornbrook...Princeton, Ind.
S of H—Mules. Track gauge 38 in.
S of M—5 Elec. mach.
PP—2 Chandler and Taylor Return tubular boilers, total 300 H. P., 1 gen. unit 250 volts, D. C., 1 pump, power purchased.
EMP—94. Last fiscal year output 74,506 tons.

ORT HARRISON MINING CO.
Terre Haute, Ind. No report.

FOX HILL COAL MINING CO.
General Office, Huntingburg, Ind.
Fox Hill Mine, Slope, No. 5 Seam.
PO—Ayrshire, Ind. SP—Same. CTY—Pike. RR—Sou.
PR—H.S. Dowell, .. Walkerton, Ind.
TR—C.M. Dowell, Huntingburg, "
EM—Edmond C. Langrebe, Huntingburg Ind.
S of H—Mules.
S of M—Hand.
EMP—10. Last fiscal year output 10,000 tons.

GIBSON-MOORE COAL CO.
Ingleside Mine.
PO—Evansville, Ind. SP—Same. CTY - Vanderburgh. No report.

GLEN AYR COAL CO.
PR—Job Freeman,.. Terre Haute, Ind.
GM—Job Freeman, " " "
TR—W.J. Freeman, " " "
PA—W.J. Freeman, " " "
GS—C. J. Freeman....Terre Haute, Ind.
CE—C.H. McCormick, " " "
EE—James Patterson, " " "

Glen Ayr No. 1, Shaft, No. 4 Seam, 4 to 5½ ft. thick.
PO—Terre Haute, Ind. SP—Same. CTY Vigo. RR—Vandalia.
MS—Wm. Wright, ..Terre Haute, Ind.
S of H—3 elec. loco. and mules. Track gauge 40 in.
S of M—14 elec. mach.
PP—4 boilers, total 600 H.P., 3 gen. units, 250 volts D.C. and 3 pumps.
EMP—250. Last fiscal year output 241,000 tons.
Glen Ayr No. 2, Shaft, No. 4 Seam 4 to 5 ft. thick.
PO—Terre Haute, Ind. SP—Same. CTY Vigo. RR—Vandalia.
MS—Samuel Ferguson, Terre Haute, Ind.
S of H—1 elec. loco. and mules. Track gauge 40 in.
S of M—10 elec. mach.
PP—2 boilers, total 250 H.P., 1 gen. unit, 250 volts D.C.
EMP—125. Last fiscal year output 46,000 tons.

GLENNDALE COAL CO.
Shaft Mine; No. 4 Seam; 51 to 79 in. thick.
PO Terre Haute, Ind.; SP—Libertyville; CTY—Vigo; RR—C. T. H & S. E.
PR—C. A. Bickett.......Chicago, Ill.
TR—B. G. Tighe, " "
GM—Hugh Shirkie....Terre Haute, Ind.
S of H—Mules.
S of M—Hand.

GOULD COAL WASHING & MNG. CO.
General Office, Indianapolis, Ind.
Mine No. 3, Shaft, No. 6 Seam, 5½ ft. thick. Operate Washery.
PO—Linton, Ind. SP—Same. CTY—Sullivan. RR—Vandalia Ry.
PR—Morton L. Gould, Indianapolis, Ind.
GM—Morton L. Gould, " "
TR—Morton L. Gould, " "
PA—Morton L. Gould, " "
MS—Jos. Stevenson, ... Linton, "
S of H—Mules and two elec. loco.
S of M—Hand and 7 elec. machines.

GRANT COAL & MINING CO.
General Office, 1304 National Bank Bldg., Chicago, Ill.
Maple Grove Mine, Shaft, No. 5 Seam, 4 ft. 10 in. to 5 ft. 2 in thick.
PO—New Goshen, Ind.; SP—Libertyville, Ind. CTY—Vigo. RR—C. T. H. & S. E.
PR—J. E. Baum, Jr.....Chicago, Ill.
GM—J. E. Baum, Jr......Chicago, Ill.
GS—H. M. Stewart, Terre Haute, Ind.
PA—H. M. Stewart " " "
CE—Rush & Everson, " " "
EM—Rush & Everson, " " "
MM—Fred Houser.....Terre Haute, Ind.
EE—R. B. Colman, Terre Haute, Ind.
SCO—Grant Mercantile Co. Buyer, Jno. R. Tanner, Terre Haute, Ind.
S of H—7 storage battery and 2 elec. loco.; track gauge 42 in.
S of M—Hand and 22 comp. air mach.
PP—6 return tubular boilers total 825 H. P., 2 gen unit, 250 volts D. C., 2 air. comp., 1 pump.
EMP—475. Last fiscal year output 408,621 tons.
Sales agent, Thec Brent, Chicago, Ill.

GREEN VALLEY COAL COMPANY.
General Office, Terre Haute, Ind.
Green Valley Mine, Shaft, No. 4 Seam. 4½ ft. to 5½ ft. thick.
PO—Jasonville, Ind. SP—Same. CTY—Greene. RR — Chicago, Terre Haute & South Eastern.
PR—David Ingle, Oakland City, Ind.
TR—W.J. Freeman, Terre Haute, "
GM—W.J. Freeman, " " "
PA—W.J. Freeman, " " "
MS—Wm. James, .. Jasonville, Mo.
S of H—Mules and 2 elec. loco. Track gauge 38 in.
S of M—14 Elec. mach.
PP—4 boilers, total 750 H.P., 2 gen. units, 250 volts D.C., 3 pumps.
EMP—275. Last fiscal year output 244,000 tons.

HARRISON COAL & MINING CO.
Harrison No. 6 Mine; Shaft; No. 2 Block Coal Seam, 36 to 48 in. thick.
PO—Clay City, Ind. SP—Same. CTY—Clay; RR—E. & I., Lancaster Br.
√ PR—W.C. Nash, ... Clay City, Ind.
TR—W.C. Nash, " " "
PA—W.C. Nash, " " "
GM—R. C. Nash " " "
SM—R.C. Nash, " " "
GS—H. Whipman, " " "
MS—G. Grafe, " " "
EM—B. Wolf, " " "
MM—R. Grafe, " " "
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—2 Vane return tubular boilers, total 150 H. P., 3 gen. units, 2 pumps.
EMP—45. Last fiscal year output 24,400 tons.

HARRISON & SONS.
Harrison Mine, Slope, Seam 3½ ft. thick.
PO—Rockville, Ind. SP—Sand Creek, Ind. CTY—Parke. RR—Vandalia.
MS—W.P. Harrison, .. Rockville, Ind.
S of H—Mules.

HIGGINS-MARTIN COAL CO.
General Office, Terre Haute, Ind.
Pine Ridge Mine, Shaft, No. 5 Seam, 4 ft. 8 in. thick.
PO—Vermilion, Ill. R. R. No. 31. SP—Libertyville, Ind. CTY—Vigo. RR—C.T.H.&S.E.
PR—J.J. Higgins, ... Clinton, Ind.
TR—O.H. Martin, Terre Haute, "
GM—O.H. Martin, " " "
PA—O.H. Martin, " " "
GS—Thos. Rose, ... Vermilion, Ill.
CE—Rush & Everson, Terre Haute, Ind.
EM—Gar Dugger, ... Vermilion, Ill.
EE—Gar Dugger, " "
S of H—Mules and 1 elec. loco. Track gauge 40 in.
S of M—Hand.
PP—2 water Tube boilers, total 300 H.P., 1 gen. unit, 250 volts, 1 C., 1 pump.
EMP—165. Last fiscal year output 150,000 tons

INDIAN CREEK COAL & MINING CO.
General Office, 817 Traction Terminal Bldg., Indianapolis, Ind.
Indian Creek Mine, Shaft, No. 5 Seam, 6 to 7½ ft. thick.
PO—Bicknell, Ind.; SP—Same, CTY—Knox. RR—Vandalia.
PR—E. D. Logsdon, Indianapolis, Ind.
TR—B. E. Neal, " "
GM—E. E. Neal, " "
PA—C. N. Elliott, " "
MS—W. P. McQuade, .. Bicknell, "
S of H—4 elec. locos.
S of M—16 mach.
PP—7 Chandler & Taylor return tubular boilers, total 950 H. P., 3 Gen. units, 250 volts D. C.
EMP—400. Last fiscal year output 488,038 tons.

INDIANA HOCKING COAL CO.
Mine permanently abandoned, April 1st 1916.

INDIANA SEMI BLOCK COAL COMPANY.
General Office, Catlin, Ind.
Indio Mine, Slope, No. 6 Seam, 7 ft. thick.
PO—Cates, Ind. SP—Same. CTY—Fountain. RR—T. St. L.&W.
PR—B. B. Taylor.......Catlin, Ind.
TR—B.B. Taylor, " "
GM—B.B. Taylor. " "
MS—Frank J. Durkin, .. Cates, Ind.
PA—Frank J. Durkin, " "
SM—Frank J. Durkin, " "
EM—Frank J. Durkin, " "
S of H—Mules, rope and 1 steam loco.
S of M—Hand.
EMP—52.

INLAND COAL & MINING CO.
General Office, Indianapolis, Ind.
GM—Harry C. Smith, Indianapolis, Ind.
TR—A. B. Swartz, " "
GS—Frank Gageby, " "
PA—Charles E. Hoffman....Brazil, Ind.
MM—E. F. McGranahan, " "

Sterling Mine; Shaft; Brazil Block No. 1 Seam. 40 to 52 in. thick.
PO—Brazil, Ind.; SP—Same; CTY—Clay; RR—C. & E. I., Otter Creek branch.
S of H—2 elec. loco. Track gauge 32 in.
S of M—6 elec. mach.
PP—3 return tubular boilers, total 480 H. P., 2 gen. units, 2300 volts A. C., 250 volts D. C., 3 pumps.
EMP—200.

Otter Valley Mine, Slope, III Seam, 84 to 96 in. thick.
PO—Brazil, Ind.; SP—Same; CTY—Clay; RR—C. & E. I., Otter Creek branch.
S of H—Rope. Track gauge 36 in.
S of M—1 elec. mach.
PP—1 pump. Power from Sterling Mine.
EMP—100. Last fiscal year output 2000 tons.

Royal Mine; Stripping IV Seam, 48 to 72 in. thick.
PO—Jasonville, Ind.; SP—Same; CTY—Greene; RR—C. T. H. & S. E.
S of H—2 steam locos.
Note—In process of development.

Highland Mine; Shaft; Minshall Seam, 60 to 66 in. thick.
PO—Brazil, Ind.; SP—Ehrmandale; CTY—Clay; RR—C. & E. I.
Sales Mgr., Harry C. Smith, Indianapolis, Ind.
Note—Successors to Domestic Block Coal Company.

INTERSTATE MINING CO.
General Office, Shelburn, Ind.
Glendora Mine; Shaft; No. 6 Seam 66 in. thick.
PO—R. R. 6, Sullivan, Ind.; SP—Glendora, Ind.; CTY—Sullivan; RR—C. T. H. & S. E.
PR—Geo. H. Richards..Terre Haute, Ind.
TR—Frank Fisbeck " "
GM—I. H. Wooley......Shelburn, Ind.
GS—I. H. Wooley, " "
PA—I. H. Wooley, " "
S of H—Rope and Mules.
S of M—8 electric machines.
PP—4 return tubular boilers, 1 gen. unit, 250 volts D. C., 1 pump.
EMP—200.

JACKSON HILL COAL & COKE CO.
General Office, Terre Haute, Ind.
PR—C. Fairbanks....Terre Haute, Ind.
TR—J. C. Kolsem, " "
GM—J. C. Kolsem, " " "
PA—J. C. Kolsem, " " "
SECY—B.F. Bailey, " " "
EM—Fred Rush, " " "
MS—W.E. Evans, " " "

No. 2 Mine, Shaft, No. 5 Seam.
PO—Sullivan, Ind. SP—Jackson Hill, Ind. CTY—Sullivan. RR—C.&E.I.
S of H—Elec. loco. and mules.
S of M—Elec. mach.
PP—Elec. 250 volts D. C.

No. 4 Mine, Shaft, No. 6 Seam.
PO—Shelburn, Ind., SP—Kolsem, Ind. CTY—Sullivan. RR—C.&E.I.
S of H—Elec. loco. and mules.
S of M—Elec. machines.
PP—Elec. 250 volts D .C.

No. 5 Mine, Shaft, No. 4 Seam.
PO—Sandford, Ind., R. F. D. No. 1; SP—Same; CTY—Vermillion; RR—C. & E. I.
S of H—Elec. loco. and mules.
S of M—Elec. machines.
PP—Elec. 250 volts D. C.

No. 6 Mine; Shaft; No. 5 Seam;
PO—Clinton, Ind., R. D. No. 2; SP—Libertyville, Ind.; CTY—Vigo, RR—C. T. H. & S. E.
S of H—Elec. loco.
S of M—Hand.

KETTLE VALLEY MINING COMPANY.
Kettle Valley Mine; Shaft; No. 6 Seam; 66 ins. thick.
PO—Shelburn, Ind. SP—Same. CTY—Sullivan; RR—S. I.
PR—O.L. Kelso, ..Terre Haute, Ind.
TR—J. W. Frisz, " " "
GM—J.W. Frisz, " " "
PA—J.W. Frisz, " " "
MS—J. H. Woolley, ..Shelburn, Ind.
EM—R. L. McCormick, Terre Haute, "
S of H—1 Elec. loco.; track gauge 36 in.
S of M—5 elec. machines.
PP—3 return tubular boilers, total 400 H. P., 1 gen. unit, 250 volts D. C. 1 pump.
EMP—95. Last fiscal year output 75,816 tons.
Sales agent, J. W. Frisz, Terre Haute, Ind.

KNOX COAL MINING COMPANY.
General Office; 37 W. Van Buren St., Chicago, Ill.
Knox Mine; Shaft No. 5 Seam, 66 to 96 in. thick.
PO—Bicknell, Ind.; SP—Same; CTY—Knox; RR—Vandalia, I. & V. Div.
PR—W. P. Worth......Chicago, Ill.
TR—H. A. Huskey......Chicago, Ill.
GM—H. A. Huskey......Chicago, Ill.

PA—H. A. Huskey......Chicago, Ill.
MS—Thos. Gillespie....Bicknell, Ind.
S of H—Mules and 3 Elec. loco.; track gauge 36 in.
S of M—14 Elec. mach.
PP—5 Water tube boilers, total 750 H. P., and 2 gen. units.

LINN COAL COMPANY.
Linn Mine, Shaft; No. 6 Seam; 46 to 52 in. thick.
PO—Bicknell, Ind.; SP—Same; CTY—Knox; RR—Vandalia, Vincennes Div
PR—J. P. Allen.......Sullivan, Ind.
TR—W. R. Maddox....Bicknell, Ind.
GM—W. R. Maddex....Bicknell, Ind.
PA—W. R. Maddex......Bicknell, Ind.
MS—Homer Cargal, " "
S of H—Mules; track gauge 3 ft.
S of M—Hand.
PP—3 Brownell return tubular boilers total 450 H. P.
EMP—120. Last fiscal year output 10,663 tons.
Sales Agent, A. L. Brocksmith, Bicknell, Ind.

LINTON SUMMIT COAL COMPANY.
General Office, Linton, Ind.
Summit Mine; Shaft; Linton No. 4 Seam; 46 to 74 in. thick.
PO—Linton, Ind. SP—So. Linton, Ind. CTY—Greene; RR—Vandalia, Greene Co. Branch.
PR—John A. Templeton, Terre Haute, Ind.
GM—John A. Templeton. Terre Haute, Ind.
GS—John A. Templeton, Terre Haute, Ind.
TR—C. N. Templeton,....Linton, Ind.
PA—C. N. Templeton, " "
MS—Wm. Boswell, " "
S of H—Mules.
S of M—6 elec. machines.
PP—Two Water Tube Boilers; 1 Gen. Unit 250 volts, D. C., 3 pumps.
EMP—120. Last fiscal year output 100,000 tons.

LITTLE, S. W., COAL CO. (THE)
General Office, Evansville, Ind.
PR—H. W. Little....Evansville, Ind.
GM—H. W. Little, " "
PA—H. W. Little, " "
TR—T B. Sieffert, " "
GS—N. W. Thrall, " "
CE—Teume Engineering Co.," "
MM—Harley Kinmay..Petersburg, Ind.
EE—W. B. Beattie, " "
SCO—The Little's Mercantile Co., Buyer Clark Whitman, Petersburg, Ind.

Little's No. 1; Shaft; No. 5 Seam, 5½ to 8 ft. thick.
PO—Little's, Ind.; SP—Same; CTY—Pike; RR—C. & E. I.
MS—N. W. Thrall......Little's, Ind.
S of H—2 Elec. loco. and mules; track gauge 40 in.
S of M—Hand.
PP—3 Wm. Pelz return tubular boilers, total 270 H. P., gen. unit 250 volts D. C., 3 pumps.
EMP—190.

Blackburn No. 1; Slope; No. 5 Seam 5½ to 11 ft. thick.
PO—Petersburg, Ind.; SP—Blackburn, Ind.; CTY—Pike; RR—C. & E. I.
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—2 Boilers, total 180 H. P.
EMP—35.

Blackburn No. 2; Shaft; No. 5 Seam, 5½ to 9 ft. thick.
PO—Petersburg, Ind.; SP—Blackburn, Ind.; CTY—Pike; RR—C. & E. I.
MS—W. B. Beattie.
S of H—2 Elec. loco. and mules; track gauge 40 in.
S of M—Hand.
PP—2 Return tubular boilers, total 250 H. P., 1 gen. unit 250 volts D. C., 2 pumps.
EMP—125.
(Old information.)

LOWER VEIN COAL CO.
General Office, Terre Haute, Ind.
PR—James Luther....Terre Haute, Ind.
GM—Geo. H. Richards, " "
PA—Geo. H. Richards, " "
TR—Frank C. Fisbeck, " "
EE—Hartley Bennett, " "
Sales Agent, Richards & Sons.

Lower Vein No. 1; Shaft; No. 5 Seam, 48 to 54 in. thick.
PO—West Terre Haute, Ind.; SP—Richards Switch, Ind.; CTY—Vigo; RR—C. C. C. & St. L.
MS—Geo. H. Richards, Terre Haute, Ind.
S of H—Mules and elec. loco. Track gauge 36 in.
S of M—Hand.
PP—2 water tube boilers, total 300 H. P., 1 gen. unit, 150 volts D. C., 1 pump.
EMP—200. Last fiscal year output 157,846 tons.

Speedwell No. 2 Mine; Shaft; No. 4 Seam; 54 to 60 in. thick.
PO—West Terre Haute, Ind.; SP—Richards Switch, Ind.; CTY—Vigo; RR—C. C. C. & St. L.
MS—Geo. H. Richards, Terre Haute, Ind.
S of H—Mules and 2 elec. loco. Track gauge 42 in.
S of M—8 Goodman elec. mach.
PP—4 Return tubular boilers total 600. H. P., 1 gen. unit 250 volts D. C., 2 turbines, 1 pump.
EMP—400. Last fiscal year output 328,462 tons.

MENDEN C. H. COAL COMPANY.
General Office, Louisville, Ky.
De Forest Mine; Shaft; No. 5 Seam; 60 to 78 in. thick
PO—Boonville, Ind; SP—De Forest, Ind; CTY—Warrick; RR—Southern, Evansville Branch.
PR—Edw. J. Hackett,.. Louisville, Ky.
TR—Edw. Hackett, " "
GM—Edw. J. Hackett, " "
PA—Edw. J. Hackett, " "
GS—Mark Wilson,.....Boonville, Ind.
MS—A. J. Hargrave, " "
S of H—Mules.
S of M—Hand.
PP—2 Return tubular boilers, total 250 H. P., 6 pumps.
EMP—60. Last fiscal year output, 75,000 tons.

MENEELY, ALBERT A. COAL CO.
R. D. No. 2, North Terre Haute, Ind.
No report.

MIAMI COAL CO.
General Office, Chicago, Ill.
PR—John T. Connery......Chicago, Ill.
TR—H. F. Filer, " "
GM—J. P. Connery, " "
CE—Allen & Garcia Co., " "
GS—H. V. Sherburne......Clinton, Ind.
PA—H. V. Sherburne, " "
MS—John Baird, " "
EE—Fred Doidge, " "
EM—Rush & Everson..Terre Haute, Ind.
Sales Agent, J. P. Connery, Chicago, Ill.

Miami No. 6 Mine; Shaft, No. 5 Seam, 57 to 69 in. thick.
PO—Clinton, Ind.; SP—Same, CTY—Vermillion RR—C. & E. I.
S of H—2 Elec. loco. and mules; track gauge 42 in.
S of M—Hand.
PP—3 Chandler & Taylor, return tubular boilers, 1 pump.
Last fiscal year output 279,734.19 tons.

Miami No. 8 Mine; Shaft, No. 4 Seam, 60 to 70 in. thick.
PO—Clinton, Ind.; SP—Same; CTY—Vermillion; RR—C. & E. I.
S of H—3 Elec. loco. and mules; track gauge 42 in.
S of M—14 Elec. mach.
PP—4 Chandler & Taylor return tubular boilers; 2 pumps.
Last fiscal year output 348,147.04 tons.

Miami No. 9 Mine; Shaft, No. 5 Seam, 57 to 69 in. thick.
PO—Clinton, Ind.; SP—Same; CTY—Vermillion; RR—C. & E. I.
S of H—1 Elec. loco. and mules; track gauge 42 in.
S of M—Hand.
PP—3 Chandler & Taylor return tubular boilers; 1 pump.
Last fiscal year output 110,343.12 tons.

MITCHEM COAL COMPANY
General Office, Boonville, Ind.
Advance Mine; Shaft; 60 to 72 in. thick.
PO—Boonville, Ind.; SP—Same; CTY—Warrick; RR—E. S. & N., Boonville branch.
PR—Frank Hargrave....Boonville, Ind.
TR—J. T. Hargrave " "
GM—J. T. Hargrave, " "
MS—Chas. Wheeler, " "
S of H—Mules.
S of M—Hand.
PP—1 Erie return tubular boiler, total 100 H. P., 2 pumps.
EMP—10. Last fiscal year output 9,280 tons.

MONON COAL CO.
Out of business. Mine operated by Vandalia Coal Co.

NASH COAL CO.
Out of business.

NEWBURGH COAL CO.
Epworth Mine; Shaft; No. 5 Seam, 44 to 54 in. thick.
PO—Newburg, Ind.; SP—Same; CTY—Warrick; RR—E. S. & N.
PR—Louis Jarlin.....Indianapolis, Ind.
TR—R. O. Tumphrey.....Newburg, Ind.
GM—Wm. Epperson, " "
GS—Wm. Epperson, " "
PA—Wm. Epperson, " "
S of H—Mules.
S of M—Hand.
PP—2 Return tubular boilers, total H. P., 300, 1 pump.
EMP—60. Last fiscal year output 28,900 tons.

NORTHERN COAL CO.
General Office, Chicago, Ill.
Muren Mine; Slope; No. 5 Seam; 60 to 72 in. thick.
PO—Winslow, Ill.; SP—Muren; CTY—Pike; RR—Southern.
PR—W. R. Tapper........Chicago, Ill.
TR—W. R. Tapper, " "
GM—J. H. Harmon, " "
GS—J. C. Muren.........Muren, Ind.
S of H—1 elec. loco. Track gauge 37 in.
S of M—5 elec. mach.
PP—Purchase power.
EMP—150. Last fiscal year output 160,000 tons.

OHIO VALLEY COAL COMPANY.
General Office, Indianapolis, Ind.
Sunlight Mine; Stripping; No. 5 Ind. Seam, 6 to 10 ft. thick.
PO—Boonville, Ind.; SP—Same; CTY—Warrick; RR—Sou, St. Louis Div.
PR—Samuel Ashley..Indianapolis, Ind.
TR—Victor C. Kendall, " "
GM—T. C. Mullens, ...Boonville, Ind.
MS—T. C. Mullens, " "
S of H—1 Steam loco.
S of M—Steam shovels.
PP—10 Boilers, total 1000 H. P., 7 pumps.
EMP—40. Last fiscal year output 119,000 tons.
Sales Mgr., T. C. Bugg, Evansville, Ind.

OHIO & INDIANA COLLIERIES CO. (THE)
O. & I. Mine; Stripping; No. 4 Seam.
PO—Clay City, Ind.; SP—Howesville, Ind.; CTY—Clay; RR—Monon.
PR—Joseph J. Jones, Oak Hill, Ohio
TR—Ira W. Aten, ...Clay City, Ind.
PA—Ira W. Aten, " " "
GM—Geo. G. Rowland, Indianapolis, Ind.
GS—Geo. G. Rowland, " "
CE—Geo. G. Rowland, " "
MS—David Rowland.....Jasonville, Ind.
MM—Cliff McKee.....Patricksburg, Ind.
S of H—2 steam locos.; track gauge 42 in.
PP—1 comp., 3 pumps.
EMP—64. Last fiscal year output 134,145.05 tons.
Sales Agent, Geo. G. Rowland, Indianapolis, Ind.

OLD SHELBURN COAL COMPANY.
Out of business.

OLIPHANT-WASSON COAL CO.
Oliphant No. 1 Mine; Shaft; No. 5 Seam, 60 to 96 in. thick.
PO—Bruceville, Ind.; SP—Same; CTY—Knox; RR—P. R. R., I. & V. Br.
PR—J. T. Oliphant.....Vincennes, Ind.
TR—F. L. Oliphant, " "
GM—Wm. Johnson, " "
PA—J. R. Henderson, " "
EM—W. E. Buss, " "
MS—Dan E. Davis....Bruceville, Ind.
EE—Harry Keenan, " "
S of H—4 elec. locos.; track gauge 42 in.
S of M—6 elec. mach.
PP—4 Brownwell, horizontal boiler, total 600 H. P., 2 gen. units, 150 K. W., 250 volts D. C., 1 pump.
EMP—200. Last fiscal year output 155,230 tons.

OTTER CREEK COAL CO.
General Office, 417 S. Dearborn St., Chicago, Ill.
Mary No. 2 Mine, Shaft, No. 1 Seam, 2 ft. 4 in. to 4 ft. thick.
PO—Fontanet, Ind.; SP—Coal Bluff, Ind.; CTY—Vigo; RR—C. & E. I.
PR—J. P. Austin......Chicago, Ill.
GM—J. P. Austin........Chicago, Ill.
PA—J. P. Austin........Chicago, Ill.
GS—John Chesterfield.....Brazil, Ind.
MS—Albert Parker, " "
EM—[illegible] J. Collier....Rosedale, Ind.
MM—[illegible] H. Collier, " "
EE—[illegible] H. Collier, " "
S of H—Mules and Rope, track gauge 3[illegible] in.
S of M—8 Elec. mach.
PP—2 Return tubular boilers, total 500 H. P., 2 gen. units, 250 volts, D. C., 1 pump.
EMP—125.

PARKE COUNTY COAL COMPANY.
Parke No. 12 Mine, Shaft; No. 3 Seam; 6 to 7½ ft. thick.
PO—Rosedale, Ind.; SP—Same; CTY—Parke; RR—Vandalia, Michigan Div
PR—Charles Minshall, Terre Haute, Ind.
TR—Otto Heyden, " "
GM—M. H. Johnson....Rosedale, Ind.
MS—Thomas Bingham, " "
PA—Jos. Entwistle, " "
EM—G. V. Stonehart, " "
MM—H. O. Cahill, " "
S of H—Mules and 2 gasoline loco.; track gauge 36 in.
S of M—Hand and 36 comp. air machs.
PP—8 Return tubular boilers, total 1200 H. P., 1 turbine, 250 volts, D. C.; 4 air comp.: 4 pumps.
EMP—375. Last fiscal year output 250,000 tons.

PEACOCK COAL & MINING CO.
General Office, Indianapolis, Ind.
Peacock No. 2, Slope; No. 5 Seam; 8 ft. thick.
PO—Oakland City, Ind.; SP—Massey, Ind., CTY—Pike; RR—Evansville & Indianapolis.
PR—Fletcher S. Hines, Indianapolis, Ind.
TR—Samuel Ashby, " "
S of H—Mules.
S of M—4 Comp. air machs.
PP—1 Air comp.; 1 pump.

PITTSBURGH MINING CO.
Sandford Nos. 1 and 2 Mines; Shafts; Nos. 4 and 6 Seams; 4½ to 6½ ft. thick.
PO—Terre Haute, Ind.; SP—Sandford, Ind.; CTY—Vigo; RR—C. C. C. & St. L.
PR—W. W. Ray....Terre Haute, Ind.
GM—W. W. Ray, " "
TR—W. L. Williamson, " "
PA—W. L. Williamson, " "
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—3 Boilers, total 550 H. P., 2 pumps.
EMP—500. Last fiscal year output 300,000 tons.

PRINCETON COAL COMPANY.
Princeton Mine, Shaft; No. 5 Seam; 6½ to 7 ½ ft. thick.
PO—Princeton Ind.; SP—Same; CTY—Gibson RR—Southern Ry. & C. & E. I. Rys.
PR—R. J. Smith......Terre Haute, Ind.
GM—J. G. Applegarth....Princeton, Ind.
PA—J. G. Applegarth....Princeton, Ind.
EM—Chas. Hill........Princeton, Ind.
MS—F. Buchanan......Princeton, Ind.
EE—Jas. Vallely........Princeton, Ind.
S of M—9 elec. mach.
PP—3 Water tube boilers, 450 H. P. and 1 pump. Purchase Elec. power.
EMP—300.

QUEEN COAL AND MINING CO.
PR—James H. Persons..Jasonville, Ind.
GM—James H. Persons, " "
TR—James S. Randolph.Lafayette, Ind.
PA—Homer Bedwell.....Jasonville, Ind.
EM—F. A. Oxley......Jasonville, Ind.
EE—Frank Harrison, " "
Sales Agent, James S. Randolph, Lafayette, Ind

Queen No. 2 Mine; Shaft; No. 5 Seam. 66 to 102 in. thick.
PO—Jasonville, Ind; SP—Latta, Ind.; CTY—Green; RR—C. T. H. & S. E.
S of H—Mules and 2 elec. locos., track gauge 36 in.
S of M—Hand.
PP—1 pump. Power from No. 4 Mine.
EMP—100. Last fiscal year output 100,000 tons.

Queen Nos. 3 and 4; Shaft; No. 4 Seam; 3 ft. 10 in. to 5 ft. 6 in. thick.
PO—Jasonville, Ind.; SP—Latta, Ind.; CTY—Green; RR—C. T. H. & S. E.
S of H—7 elec. locos. and mules; track gauge 36 in.
S of M—13 elec. mach. and hand.
PP—5, Atlas, Brownell and Terre Haute boilers, total 600 H. P., gen. unit 250 volts D. C. and 1 pump.
EMP—(3) 75. (4) 250. Last fiscal year output, (3) 75,000 tons. (4) 175,000 tons.

ROSE HILL COAL CO.
General Office, Linton, Ind.
Rose Hill Mine; Shaft; No. 6 Seam; 66 in. thick.
PO—Linton, Ind.; SP—Victoria, Ind.; CTY—Greene; RR—C. I. & L.
PR—Thos. W. Richardson, Linton, Ind.
TR—Malcolm Reed " "
GM—Malcolm Reed " "
GS—T. W Richardson, " "
PA—Malcolm Reed " "
EM—Herbert Forbes, " "
MM—John Jones, " "
EE—J. L. Murrer, " "
CE—A. T. Bennet....Terre Haute, Ind.
SCO—T. J. Scott & Co. Buyer, Malcolm Reed, Linton, Ind.
MS—Thos. W. Richardson, Linton, Ind.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—1 pump.
EMP—100. Last fiscal year output 52,250 tons
Sales Agency, Reliance Coal & Grain Co., Indianapolis, Ind.

ROWLAND BLOCK COAL & CLAY CO.
General Office, Vincennes, Ind.
PO—Clay City, Ind.; SP—Same; CTY—Clay; RR—Monon.
Rowland No. 3 Mine; Stripping; Block Seam, 42 in. thick.
PR—E. E. Eubanks........Jackson, O.
TR—Ira W. Aten......Clay City, Ind.
PA—Ira W. Aten, " "
GM—George G. Rowland, Indianapolis, Ind.
EM—George G. Rowland, " "
GS—J. Webster Jones, Patricksburg, Ind.
MS—Samuel G. Rowland, " "
MM—Clifford McKee, " "
S of H—2 Vulcan loco. and mules; track gauge, 36 in.
S of M—2 steam shovels.
PP—5 Pumps.
EMP—45. Last fiscal year output 83,653.40 tons
Sales Agency, Pittsburg Coal Co. of Illinois.

SARGEANT COAL COMPANY
General Office, Newburgh, Ind.
PR—E. G. Sargeant.....Newburgh, Ind.
GM—E. G. Sargeant, " "
PA—E. G. Sargeant, " "
GS—B. W. Leach, " "
MS—Ben Bates, " "
EM—Ben Bates, " "
MM—Smith Abshier, " "
SM—Chas. W. Rothroep, " "
TR—M. H. Sargeant...Evansville, Ind.

Mine No. 1; Shaft; No. 5 Seam; 48 to 52 in. thick.
PO—Newburgh, Ind.; SP—Same; CTY—Warrick; RR—E. S. & N. & E. E.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—4 Heilman water tube boilers, total 400 H. P., and 3 pumps.
EMP—80. Last fiscal year output 36,197 tons.

No. 2 Mine;; Shaft; No. 5 Seam; 48 to 58 in. thick.
PO—Newburgh, Ind.; SP—Same; CTY—Warrick; RR—E. S. & N.
S of H—Mules.
EMP—15. Last fiscal year output 18,000 tons. Sales agent, E. G. Sargeant, Newburgh, Ind.

SCALES, T. D., COAL CO.
Electric Mine.
Out of business. Mine worked out.

SCHREPFERMAN COAL CO.
No. 1 Mine; Shaft; Lower Nine Block Seam, 40 to 48 in. thick.
PO—Brazil, Ind.; SP—Same; CTY—Clay; RR—Vandalia.
GM Nick Schrepferman, ..Brazil, Ind.
MS—Bismarck Schrepferman, " "
EM - Corneilus Schrepferman, " "
S of H—Mules and tail rope; track gauge 36 in.
S of M—Hand and 2 elec. mach.
PP—2 water tube and 2 return tubular boilers.
EMP—90. Last fiscal year output 20,000 tons.

SHIRKIE COAL CO.
General Office, Terre Haute, Ind.
Nos. 1 Mine; Shaft; No. 5 Seam, 4 to 4ft. 8in. thick.
PO—Terre Haute, Ind.; R. D. No. 1; SP—Libertyville, Ind.; CTY—Vigo; RR—C. T. H. & S. E.
PR—Edw. Shirkie.....Terre Haute, Ind.
TR—M. H. Stark, " "
GS—S. Jones, " "
CE—H. Hermmann, " "
EE—Thos. James, " "
S of H—1 elec. and 2 storage battery locos. Track gauge 42 in.
S fo M—Hand.
PP—1 pump.
EMP—390. Last fiscal year output 306,000 tons.

SMITH, H. O., COAL CO.
Drift mine, seam 7 ft. 4 in. to 8 ft. thick.
PO—Indianapolis, Ind.; SP—Ehrmandale, Ind.; CTY—Marion.
PR C. & E. I. Railroad, Otter Creek Dv.
S of H—Mule and rope, track gauge 36 in.
S of M Hand.
Development new under way..

STOCKTON COAL CO.
General Office, Dugger, Ind.
PR—R. E. Price........Dugger, Ind.
PA—R. E. Price, " "
SM—R. E. Price, " "
GS—Ebert Hammock, " "
MM—E. R. Dickey, " "
Sales Agent, R. E. Price, Dugger, Ind.

Freeman; Shaft; No. 6 Seam, 5 to 5½ ft. thick.
PO—Dugger, Ind.; SP—Same; CTY—Sullivan; RR—I. C.
MS—Ebert Hammock.....Dugger, Ind.
S of H—Rope and mules; track gauge 36 in.
S of M—Hand.
PP -2 Atlas boilers; 1 pump.
EMP40. Last fiscal year output 55,000 tons.

P. & J. Mine; Shaft; No. 4 Seam; 50 to 64 in. thick.
PO—Midland, Ind.; SP—Same, CTY—Greene; RR—C. T. H. & S. E.
MS—Frank Freund......Midland, Ind.
S of H—Mules: track gauge 36 in.
S of M—2 Elec. mach.
PP—2 Jeffrey return tubular boilers and 1 pump.
EMP—25. New mine.

SUGAR VALLEY COAL CO.
General Office, Terre Haute, Ind.
PR—George Epperson...Terre Haute, Ind.
GS—George Epperson, " "
TR—C. F. Thorp, " "
PA—L. L. Lehman, " "

National Mine; Shaft; Fifth Vein, 48 to 56 in. thick.
PO—West Terre Haute, Ind.; SP—Macksville; CTY—Vigo; RR—Vandalia
S of H—Mules.
PP—1 boiler, total 150 H. P., 1 pump.
EMP—200. Last fiscal year output 103,000 tons.

Sugar Valley Mine; Shaft; Fifth Vein; 48 to 56 in. thick.
PO—West Terre Haute, Ind.; SP—Macksville; CTY—Vigo; RR—Vandalia.
S of H—Mules.
PP—1 return tubular boiler, total 125 H. P., 1 pump.
EMP—40. Last fiscal year output 17,000 tons.

SUNBEAM COAL CO.
Sunbeam Mine; Shaft; Seam No. 5, 48 to 52 in. thick.
PO—Terre Haute, Ind.; SP—Macksville, Ind.; CTY—Vigo; RR—Vandalia.
PR—Henry Hafer, ...Chicago, Ill.
TR—Jas. H. McClelland, Terre Haute, Ind.
GM—Jas. H. McClelland, Terre Haute, Ind.
PA—Jas. H. McClelland, Terre Haute, Ind.
MS—J. Baxter.......Terre Haute, Ind.
MM—W. McCarty.....Terre Haute, Ind.
EE—W. McCarty......Terre Haute, Ind.
S of H—1 elec. and 3 storage battery locos. and mules; track gauge 36 in.
S of M—Hand.
PP—3 Boilers, total 300 H.P., gen. unit, 250 volts D. C., 1 pump.
EMP—200. Last fiscal year output 129,687 tons.

SUNFLOWER COAL COMPANY.
Sunflower Mine, Shaft; No. 5 and 6 Seam; 60 to 84 in. thick.
PO—Dugger, Ind.; SP—Same; CTY—Sullivan; RR—I. Cent., Ind div.
PR—F. M. Dugger......Dugger, Ind.
TR—W. R. Dugger, " "
GM—M. E. Dugger, " "
PA—M. E. Dugger,....Dugger, Ind.
GS—O. E. Dugger, " "
CE—E. H. Dugger, " "
MM—E. H. Dugger, " "
MS—T. E. Leaman, " "
EE—O. E. Meyer, " "
SM—R. E. Price, " "
S of H—2 Elec. loco.; track gauge 36 in.
S of M—11 Elec. mach.
PP—3 Return tubular boilers, total 450 H. P., 2 gen. units, 250 volts, D. C.
EMP—275. Last fiscal year output 201,000 tons.

SUNLIGHT COAL COMPANY.
General Office, Indianapolis, Ind.
Sunlight Mine; Stripping; No. 5 Seam; 7 ft. thick.
PO—Boonville, Ind.; SP—Same; CTY—Warrick; RR—Southern.
PR—Samuel Ashby—Indianapolis, Ind.
TR—Victor C. Kendall, "
GM—T. C. Mullins, ...Boonville, Ind.
PA—T. C. Mullins, " "
S of H—1 Steam loco.; track gauge 36 in.
S of M—Steam shovels.
PP—2 pumps.
Last fiscal year output 119,900 tons.

SUNNYSIDE COAL & COKE CO.
Sunnyside Mine; Shaft.
PO—Evansville, Ind.; SP—Same; CTY—Vanderburg; RR—C & E I.& I C.
GM—Jas. H. Moore,.. Evansville, Ind.
PA—Jas. H. Moore, " "
EM—Carlos Wilson, " "
MS—A. Sams..........Evansville, Ind.
S of H—Mules.
S of M—Hand.
PP—2 boilers, each 100 H. P.

TECUMSEH MINING CO.
PR—W. H. Howe.......Chicago, Ill.
TR—W. J. Freeman..Terre Haute, Ind.
GM—W. J. Freeman, " "
PA—W. J. Freeman, " "
EM—Fred Rush, " "
GS—Val Martin........Bicknell, Ind.
Sales Agency, Martin Howe Coal Co., Chicago, Ill.

Tecumseh No. 1 Mine; Shaft; No. 5 Seam, 5 to 7 ft. thick.
PO—Bicknell, Ind.; SP—Same; CTY—Knox; RR—P. R. R.
MS—Isaac Valentine....Bicknell, Ind.
S of H—2 Elec. loco. and mules; track gauge 40 in.
S of M—22 Comp. air Mach.
PP—7 boilers, total 750 H. P., gen. unit 250 volts D. C., 2 comp. and 1 pump.
EMP—270. Last fiscal year output 382,000 tons.

Tecumseh No. 2; Shaft; No. 5 Seam; 5 to 7 ft. thick.
PO—Bicknell, Ind.; SP—Same; CTY—Knox; RR—P. R. R.
MS—Wm. Martin, ... Bicknell, Ind.
S of H—2 Elec. loco. and mules; track gauge 40 in.
S of M—14 Elec. mach.
PP—6 boilers, total 750 H. P., gen. unit 250 volts D. C., 1 pump.
EMP—275. Last fiscal year output 230,000 tons.

UNITED FOURTH VEIN COAL CO.
General Office, Indianapolis, Ind.
PR—E. R. Dye......Indianapolis, Ind.
GM—E. R. Dye, " "
TR—E. R. Dye......Indianapolis, Ind.
GS—Clay Moss.........Linton, Ind.
PA—G. D. Yeazel....Indianapolis, Ind.
EM—Warren Butler.
MM—John Brock.....Jasonville, Ind.
EE—John Brock. " "
SCO—J. W. Wolford & Son, Buyer, George Mendenhall, Linton, Ind.
Sales Agent, E. R. Dye, Indianapolis, Ind

Black Creek Mine; Shaft; No. 4 Seam, 4 ft. thick.
PO—Linton, Ind.; SP—Same; CTY—Green; RR—C. T. H. & S. E.
MS—Nat Haggerman......Linton, Ind.
S of H—2 Elec. loco. and mules; track gauge 36 in.
S of M—10 Elec. mach.
PP—3 boilers, total 325 H. P., gen. unit 250 volts D. C., 5 pumps.
EMP—250. Last fiscal year output 200,000 tons.

Antioch Mine; Shaft; No. 5 Seam; 5 ft. thick.
PO—Sullivan, Ind.; SP—Linton, Ind.; CTY—Green; RR—C.T.H.&S.E.
MS—Thos. Dodds.....Jasonville, Ind.
S of H—Mules; track gauge 40 in.
S of M—8 Elec. mach.
PP—3 boilers, total 325 H. P., gen. unit 250 volts D. C., 3 pumps.
EMP—250. Last fiscal year output 100,000 tons.

Island Valley Mine, Shaft; No. 4 Seam, 4 ft. 4 in. thick.
PO—Jasonville, Ind.; SP—Same; CTY—Clay; RR— C. T. H. & S. E.
MS—M. Clay Moss......Linton, Ind.
S of H—1 Elec. loco.; track gauge 38 in.
S of M—8 Elec. mach.
PP—3 boilers, 325 H. P., gen. unit 250 volts, D. C., 5 pumps.
EMP—160. Last fiscal year output 125,000 tons.

VANDALIA COAL CO.
General Office, ... Terre Haute, Ind.
PR—A.M. Ogle, " " "
TR—A.M. Ogle, " " "
GM—John Hewitt, " " "
GS—H.P. Dyer, " " "
EM—H.P. Dyer, " " "
PA—F. G. Van Winkle, Terre Haute, Ind.
DIST SUPTS—Wellington O'Connor, Terre Haute, Ind.; John Boyle, Linton, Ind., and Wesley S. Harris, Linton, Ind.
Sales Agent, B. R. Batty, Indianapolis. Ind.

Mine No. 8, Shaft, No. 4 Seam, 4½ to 5½ ft. thick.
PO—Linton, Ind. SP—Same. CTY—Greene. RR—Vandalia, Vincennes Branch.
MS—Jack Quigley, ... Linton, Ind.
S of H—4 elec. storage battery loco. and mules. Track gauge 42 in.
S of M—12 elec. mach.
PP—6 return tubular boilers, total 900 H. P., 2 gen. units 250 volts D. C. and 6 pumps.
EMP—200. Last fiscal year output 240,000 tons.

No. 9 Mine, Shaft. No. 4 Seam, 4½ to 5½ ft. thick.
PO—Linton, Ind. SP—Same. CTY—Greene. RR—Vandalia, Vincennes Branch.
MS—Chas. Dodge, ... Linton, Ind.
S of H—2 Elec. loco and mules. Track gauge 42 in.
S of M—18 elec. mach.
PP—4 water tube boilers, total 600 H. P., 2 gen. units, 250 volts D.C., and 5 pumps.
EMP—350. Last fiscal year output 360,000 tons.

No. 10 Mine, Shaft, No. 4 Seam, 5 to 5½ ft. thick.
PO—Linton, Ind. SP—Same. CTY—Greene. RR—Vandalia, Vincennes Branch.
MS—Tom Lirpitt, ... Dugger, Ind.
S of H—4 elec. loco. and mules. Track gauge 42 in.
S of M—24 elec. mach.
PP—5 return tubular boilers, total 750 H.P., 2 gen units 250 volts D.C. and 3 pumps.
EMP—300. Last fiscal year, output 388,000 tons.

No. 20 Mine, Shaft, No. 5 Seam, 5 to 7 ft. thick.
PO—Linton, Ind. SP—Same. CTY—Greene. RR—Vandalia, Vincennes Branch.
MS—Andy Miller, ... Linton, Ind.
S of H—2 elec. loco. and mules.
S of M—12 elec. Mach.
PP—4 return tubular boilers, total 600 H.P., 2 gen. units 250 volts D. C., 2 pumps.
EMP—250 Last fiscal year output 432,000 tons.

No. 82 Mine; Shaft; No. 5 Seam, 4 to 5 ft. thick.
PO—Terre Haute, Ind. SP—Maxville, Ind. CTY—Greene. RR—Vandalia, Main Line.
MS—Geo. Murdock....Terre Haute, Ind.
S of M—Hand and elec. mach.
S of H—Mules and storage battery loco.
PP—2 return tubular boilers, total 300 H. P. Purchase power.

WARRICK COAL MINING CO.
General Office, Chicago, Ill.
Polk Patch Nos. 5 and 7 Mines, Stripping.
No. 5 Seam, 5½ to 8 ft. thick.
PO—Boonville, Ind. SP—Same and DeGonia, Ind. CTY—Warrick. RR—Sou., L.C.L. and C.L. Brs.
PR—J.E. Hitt, ... Chicago, Ill.
TR—J.E. Hitt, " "
MS—Chas. Gottschalk..Booneville, Ind.
S of H—2 gasoline loco. Track gauge 42 in.
S of M—Comp. air mach. and steam shovels.
PP—4 Brownell Water Tube Boilers.
EMP—40. Output 100,000 tons.

WARRICK COUNTY COAL CO.
Henry Korff Mine, Shaft, No. 12 Seam, 6 to 7 ft. thick.
PO—808 Upper 8th St., Evansville, Ind. SP—Korff's, Ind. CTY—Warrick, RR—E. S. N. and Sou.
PR—Henry Korff, Sr....Evansville, Ind.
GM—Walter B. Korff.
GS—Walter B. Korff " "
PA—Walter B. Korff, " "
MS—Edw. Stamps.......Boonville, Ind.
CE—Onis Rudoulph......Boonville, Ind.
ME—Rush & Everson..Terre Haute, Ind.
S of H—1 Comp. air loco.; track gauge 36 in.
S of M—6 comp. air machines.
PP—2 boilers, total 240 H.P., 1 air comp. 4 pumps.
EMP—100. Output 400 tons daily.

WASHINGTON-WHEATLAND COAL CO.
Shaft Mine; No. 5 Seam; 48 to 84 in. thick.
PO—Wheatland, Ind. SP—Same. CTY—Knox RR—B. & O. S. W.
PR—A.E. Nicholson, Wheatland, Ind.
TR—A.C. Nicholson, " "
GM—Thos. Harris, "
PA—Thos. Harris, " "
GS—Thos. Harris......Wheatland, Ind.
S of H—Mules and Rope.
S of M—Hand.
PP—3 Boilers, total 180 H. P., and 1 pump.
EMP—150.

WEST CLINTON COAL COMPANY.
General Office, Terre Haute, Ind.
West Clinton No. 1 Mine, Shaft, No. 5 Seam, 4 ft. 8 in. to 5 ft. 2 in. thick.
PO—Clinton, Ind.; SP—Blanford, Ind.; CTY—Vermillion, RR—C. T. H. & S. E.
PR—John Shirkie,.. Terre Haute, Ind.
GM—Steward Shirkie, " "
PA—Stewart Shirkie, Terre Haute, Ind.
EM—Henry Henneman, Terre Haute, Ind.
MS—Fred Mitch........Blanford, Ind.
(No post office at Blanford. Address all mail to Terre Haute.)
S of H—Storage battery loco. Track gauge 42 in.
S of M—Hand.
PP—2 Brownell water tube boilers, 250 volts D.C.
EMP—335. Last fiscal year output 300,000 tons.

WEST SIDE COAL CO.
General Office, Brazil, Ind.
PR—Chas. H. Zeller.......Brazil, Ind.
GM—Chas. H. Zeller, " "
TR—Benj. Schrepferman, " "
PA—Benj. Schrepferman, " "
MS—Benj. Schrepferman, " "
CE—Geo. Sheehan, " "

West Side Mine No. 1, Shaft, Brazil Lower Vein Block Seam; 37 to 48 in. thick.
PO—Brazil, Ind.; SP—Same; CTY—Clay; RR—Vandalia & C. & E. I.
S of H—Mules.
S of M—Hand.
PP—1 pump.
EMP—35. Last fiscal year output 22,000 tons.

West Side Mine No. 2; Drift; No. 3 Seam; 84 to 96 in. thick.
PO—Brazil, Ind.; SP—Same; CTY—Clay; RR—Vandalia & C. E. & I.
S of H—Mules.
S of M—Hand.
PP—1 pump.
EMP—12. Last fiscal year output 10,000 tons.

WESTERN INDIANA MINING COMPANY.
Minshall, Wabash and Riverside Mines.
PO—Terre Haute, Ind. SP—Same.CTY—Vigo. No report.

WIZARD COAL CO.
Wizard No. 2, Shaft, No. 5 Seam.
PO—Terre Haute, Ind. SP—Macksville, Ind. CTY—Vigo. RR—Vandalia.
PR—W.C. Hall, Sr., .. Brazil, Ind.
TR—W. Paul Zimmerman, Terre Haute, Ind.
PA—W. Paul Zimmerman, Terre Haute,
GS—W.G. Spears, W. Terre Haute, Ind.
EM—W.G. Spears, " " " "
S of H—Mules and Elec. loco., track gauge 36 in.
S of M—Hand.
PP—3 Return tubular boilers total 400 H. P.; gen. unit 250 volts, D. C.
EMP—200. Selling agency, Hall-Zimmerman Coal Co., Terre Haute, Ind.

WOOLEY, J. COAL CO.
General Office, Evansville, Ind.
PR—J. Wooley, ... Evansville, Ind.
TR—J. Wooley, " "
GM—J. Wooley, " "
PA—H.W. Matters, " "
VP—H.W. Matters, " "
SM—H.W. Matters, " "
CE—John A. Garcia. .. Chicago. Ill.
EM—Chas. Gottschalk...Boonville, Ind.
Sales agent, H. W. Matters, Evansville, Ind.

Polk Nos. 5 and 7, Shaft, No. 5 Seam, 5 to 9 ft. thick.
PO—Boonville, Ind. SP—Same. CTY—Warrick. RR—Sou., Evansville Branch.
S of H—2 gasoline loco. and mules. Track gauge 42 in.
S of M—15 comp. air mach.
PP—4 Brownell water tube boilers, total 600 H.P., 3 compressors and 6 pumps.
EMP—240.

Castle Garden No. 6, Shaft.
PO—Chandler, Ind. SP—Same. CTY—Warrick. RR—Southern, Evansville Branch.
MS—John W. Miller....Evansville, Ind.
S of H—Mules. Track gauge 42 in.
S of M—Hand.
PP—2 water tube boilers, total 100 H.P., 3 pumps. Closed at present, March 1st.

Paxton No. 8, Shaft, No. 5 Seam, 5 to 7½ ft. thick.
MS—J. D. McInness......Paxton, Ind
PO—Paxton, Ind. SP—Same. CTY—Sullivan. RR—C. & E. I.
S of H—8 elec. locos.
S of M—13 elec. mach.
PP—4 Brownell water tube boilers, 600 H. P., 2 gen. unit, 150 K. W., 250 volts D. C. Last fiscal year output 300,000 tons.

Mildred No. 13; Shaft; No. 6 Vein; 72 in. thick.
PO—Shelburn, Ind.; SP—Same; RR—C. & E. I.; CTY—Sullivan.
MS—J. D. McInnes......Mildred, Ind.
S of H—2 elec. locos and mules.
S of M—8 elec. machs.
PP—3 water tube boilers, total 375 H. P., 1—200 K. W. gen. unit, 250 volts D. C.
Output, Oct., Nov., Dec., 1915, 40,000 tons.
New mine opened Sept. 1915.

WYOMING COAL COMPANY.
Francisco Mine, Shaft, 235 ft. deep, No. 5 seam, 60 to 78 in. thick.
PO—Francisco, Ind. SP—Same. CTY—Gibson. RR—Southern Ry.
PR—Levi Bird. ..... Norway. Mich.
TR—Ella C. Bird, .. Francisco, Ind.
PA—Ella C. Bird, " "
GM—John C. Bird, " "
MS—John C. Bird, " "
GS—John C. Bird, " "
CE—Levi Hanna, " "
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—One boiler, total 250 H. P., 1 pump.
EMP—16. Last fiscal year output 30,140 tons. Sales agent, Ella C. Bird, Francisco, Ind.

ZELLER-McCLELLAN & COMPANY.
Mine No. 6, Shaft, Lower Seam, Brazil Block, 2 ft. 8 in. to 3 ft. 8 in. thick.
PO—Brazil, Ind.; SP— Same CTY—Clay. RR - Central Ind.
PR—W.M. Zeller, ... Brazil, Ind.
GM—W.M. Zeller, " "
PA—W.M Zeller, " "
TR—C.M. Zeller; " "
MS—Ike Hansel, ... Carbon, "
S of H—Mules; track gauge 36 in.
S of M—electric machines.
EMP—110. Last fiscal year output 80,000 tons.

IOWA

For List of Abbreviations See Page 622.

ACKEN COAL CO.
No. 16½ Mine; Shaft; Walnut Block Seam; 28 in. thick.
PO—Mystic, Ia.; SP—Same; CTY—Appanoose.
PR—Wm. Porter...........Mystic, Ia.
GM—Wm. Porter, " "
GS—Wm. Porter, " "
PA—Wm. Porter, " "
MS—Wm. Porter, " "
TR—T. Porter, " "
S of H—Mules.
EMP—60. Last fiscal year output 2,500 tons.

ALBIA COAL CO.
Albia Mine No. 1, Shaft, Seam 6 to 7 ft. thick.
PO—Albia, Ia. SP—Same. CTY—Monroe. RR—M.&St. L.
PR—H. H. Harris......Ottumwa, Ia.
TR—H.H. Harris, " "
GM—H.H. Harris, " "
PA—H.H. Harris, " "
SM—H.H. Harris, " "
MS—B. A. Harris ....Albia, Ia.
S of H—Rope and mules. Track gauge 36 in.
S of M—Hand.
PP—4 Return tubular boilers, total 450 H.P.
EMP—175. Last fiscal year output 100,000 tons. Sales agent, H. H. Harris, Ottumwa, Ia.

ALPINE COAL CO.
Out of business.

AMERICAN COAL CO.
See Blount Evans Coal Co.

ANCHOR COAL CO.
General Office, Ottumwa, Ia.
PR—W.R. Daum, ... Ottumwa, Ia.
TR—W.H. Ferguson, " "
GM—W.H. Ferguson, " "
PA—W.H. Ferguson, " "
SCO—Laddsdale Supply Co. Buyer, W. H. Ferguson, Ottumwa, Ia.

Anchor No. 2 Mine, shaft, Seam 32 in. thick.
PO—Centerville, Ia. SP—Same. CTY—Appanoose. RR—C.R.I.&P.
MS—W. F. Young......Centerville, Ia.
S of H—Mules. Track gauge 34 in.
S of M—Hand.
PP—2 boilers, total 200 H.P., 1 pump.
EMP—200.

Laddsdale No. 2 Mine, Slope, Seam 32 in. thick.
PO—Laddsdale, Ia. SP—Eldon, Ia. CTY—Davis. RR—C.R.I.&P.
MS—Geo. Voyce........Laddsdale, Ia.
SM—Glen Wilson, " "
S of H—1 elec. loco. Track gauge 36 in.
S of M—3 elec. mach.
PP—2 boilers, total 160 H.P., 1 generating unit, 250 volts, D.C., 1 pump.
EMP—40.

ANDERSON COAL CO.
Anderson Mine; Shaft; 3rd Vein; 60 to 120 in. thick.
PO—Knoxville, Ia.; SP—Same; CTY—Marion; RR—C. R. I. & P.
PR—J. H. Anderson.....Oskaloosa, Ia.
TR—E. J. Morris, " "
GM—F. B. McCaigg....Des Moines, Ia.
GS—W. E. Evans, " "
MS—W. E. Evans, " "
SCO—Mitchell Supply Co., Knoxville, Ia.
PP—2 Erie return tubular boilers, total 160 H. P., 3 gen. units.
EMP—150. Last fiscal year output 70,000 tons.

ARMSTRONG COAL COMPANY.
Mine No. 1, Shaft, Seam 30 to 36 in. thick.
PO—Cincinnati, Ia. SP—Same. CTY—Appanoose. RR—C.B.&Q., C.B.& K. C.
TR—E. R. Ducky....Kansas City, Mo.
PR—W. D. Ketcham....Mendota, Mo.
GM—W.D. Ketcham, " "
GS—W.D. Ketcham, " "
PA—W. D. Ketcham, Mendota Mo.
MS—Chas. H. Harrison, Cincinnati, Ia.
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—2 return tubular boilers, total 200 H.P.
EMP—100 Sales Agent, Star Coal Co., Kansas City, Mo.

ATWOOD COAL CO.
Out of business.

BARRETT COAL CO.
Barrett Mine, Slope, Seam 30 in. thick.
PO—Mystic, Ia. SP—Same. CTY—Appanoose. RR—C. M. & St. P.
PR—Jas. Barrett, ... Mystic, Ia.
GM—Jas. Barrett, "
MS—Jas. Barrett, " "
PA—J.J. Barrett, " "
S of H—Elec. loco.; track gauge 30 in.
S of M—Hand.
EMP—40. Last fiscal year output 9,000 tons. Sales agent, J. J. Barrett, Mystic, Ia.

BECK COAL & MINING CO.
Shaft Mine Seam 3 to 4 ft. thick.
PO—DesMoines, Ia.; CTY—Polk; RR—C. R. I. & P.
PR—Thomas Beck........Des Moines, Ia.
GM—Thomas Beck, " "
TR—D. P. Reinking, " "
MS—John T. Beck, " "
MM—Bert Aulhonan. " "
EE—Henry Sutphin, " "
EM—L. Higgins, " "
S of H—Mules.
S of M—3 Elec. mach.
PP—2 water tube boilers, 1 pump.
EMP—60. Last fiscal year output 40,718 tons.

BEGGS COAL CO.
No. 7 Mine; Shaft; Seam 32 in. thick.
PO—Mystic, Ia. SP—Same. CTY—Appanoose. RR—C.M.&St. P.
PR—Wm. Beggs...........Mystic, Ia.
PA—Wm. Beggs, " "
S of H—Mules. 1 gasoline loco. Track gauge 31 in.
S of M—Hand.
PP—1 pump.
EMP—12. Last fiscal year output 1,600 tons.

BENNETT BROS. COAL CO.
Des Moines, Ia. No report.

BIDWELL COAL CO.
Shaft Mine, No. 5 Seam; 48 to 72 in. thick.
PO—Bidwell. Ia.; SP—Same CTY—Wapello; RR—C. M. & St. P., K. C. Div.
PR—John Ramsay........Oskaloosa, Ia.
TR—Homer H. Harris....Ottumwa, Ia.
GM—Homer H. Harris, " "
PA—Homer H. Harris, " "
GS—W. T. Ramsey........Bidwell, Ia.
CE—C. Pabst, " "
EE—C. Pabst, " "
MM—Royal Lovell, " "
EM—W. T. Ramsey, " "
SM—Gantz Kellogg, " "
S of H—Mules; track gauge 36 in.
S. of M—Hand.
PP—2 Return tubular boilers, total 300 H. P.
EMP—250. Last fiscal year output 150,000 tons.

BIG BLOCK COAL CO.
No. 10 Mine; Slope; Centerville Seam, 36 to 48 in. thick.
PO—Coal City, Ia.; SP—Same; CTY—Appanoose; RR—I. & St. L.
No report.

BIG JO BLOCK COAL CO.
Discontinued operations April 30, 1913.

BLACKBIRD CREEK COAL CO.
Blackbird Mine, Slope.
PO—Centerville, Ia. SP—Unionville, Mo. CTY—Appanoose. RR—C. B. & Q., Burlington & Carrolton Br.
GM—C. W. Lane, ... Centerville, Ia.
S of H—Mules and rope. Track gauge 34 in.
S of M—Hand.
Mine closed for two years, may reopen again this season.

BLOOMFIELD & BLOOMFIELD.
General Office, Coalfield, Ia.
Granger Mine; Slope; 32 to 48 in. thick.
PO—Coalfield, Ia; SP—Same; CTY—Monroe; RR—M. & St. L.
GM—C. N. Bloomfield, Sr. Coalfield, Ia.
MS—Thomas Smith, " "
EM—Frank Woodard, " "
SCO—Coalfield Supply Co., Buyer, C. N. Bloomfield, Coalfield, Ia.
S of H—Rope.
PP—1 boiler, total 125 H. P., Last fiscal year output, 20,000 tons.
Note—Formerly Coalfield Fuel Company.

BLOOMFIELD COAL & MINING CO.
Bloomfield Mine, No. 4, Shaft, 3½ to 5 ft. thick.
PO—Des Moines, Ia.; SP—Saylor, Ia.; CTY—Polk. RR—C. & N.W. Ry.
PR—Geo. Yarn, ... Des Moines, Ia.
MS—Geo. Yarn. " "
TR—A. F. Carlson......Des Moines, Ia.
GM—Chas. S. Worth, " "
PA—Chas. S. Worth, " "
S of H—1 Gasoline loco. and mules; track gauge 34 in.
S of M—Elec. mach. and hand.
PP—Purchase power.
EMP—153. Last fiscal year output 97,260 tons.

BLOUNT-EVANS COAL CO.
Blount-Evans No. 1 Mine; Shaft; No. 3 Seam, 36 to 60 in. hick.
PO—Des Moines, Ia.; SP—Broadmoor, Ia.; CTY— Polk; RR—Iner-Urban, Urbandale Br.
PR—I. Evans..........Des Moines, Ia.
GM—I. Evans, " "
MS—I. Evans, " "
TR—S. H. Blount, " "
PA—J. H. Duro, " "
S of H—Mules; track gauge 32 in.
S of M—Hand.
PP—2 Return tubular boilers, total 200 H. P., 1 pump.
EMP—150. Last fiscal year output 60,000 tons.
Sales Agent, J. H. Duro, Des Moines, Ia.

BOLTON HOOVER COAL CO.
General Office, Oskaloosa, Ia.
Bolton Mine, No. 3, Slope, Beacon Seam 48 to 78 in. thick.
PO—Oskaloosa, Ia., R.F.D. No. 5. SP—Bolton, Ia. CTY—Mahaska. RR—C. B. & Q., Tracey branch
PR—F.N. Smith, ...Burlington, Ia.
TR—W.W. Branigar, Oskaloosa, "
GM—W.W. Branigar, " "
PA—W.W. Branigar, " "
GS—J. W. Canty, R. F. D. 5 " "
EM—J. W. Canty, " "
SCO—Bolton Supply Co. Store. Buyer, R. P. Morrison, R. R. No. 5, Oskaloosa, Ia.
S of H—Mules and rope. Track gauge 36 in.
S of M—2 Elec. mach. and hand.
PP—2 return tubular boilers, total 200 H. P., gen. unit, 220 volts A. C., 3 phase, 60 cicles. 3 pumps. Power purchased.
EMP—128. Last fiscal year output 86,840 tons. Sales agent, W. W. Branigar, Oskaloosa, Ia.

BOONE BLOCK COAL CO.
Boone Mine, Shaft, Seam 3 to 4½ ft. thick.
PO—Boone, Ia. SP—Same. CTY—Boone. RR—C.&N.W.C.M.&St.P. and the Ft. D.D.M.&So.
PR—Geo. Heaps, Sr., ... Boone, Ia.
GM—Geo. Heaps, Sr., " "
TR—Robt. Kennedy, ... Ogden, "
GS—Wm. Benson, ... Boone, "
S of H—Mules. Track gauge 2 ft. 8 in.
S of M—Hand.
PP—3 water tube boilers, total 300 H. P., 1 pump.
EMP—130. Last fiscal year output 37.000 tons.

CARBON BLOCK COAL CO.
No. 30 Mine, Shaft, Seam 28 to 36 in. thick.
PO—Centerville, Ia. SP—Same. CTY—Appanoose. RR—C.R.I.&P.
PR—A.D. Crawford, ..Centerville, Ia.
GM—A.D. Crawford, " "
MS—John Atkinson, Jr., " "
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—2 return tubular boilers, total 120 H.P.
EMP—250. Last fiscal year output 100,000 tons.

CENTER COAL CO.
Center No. 1 Mine, Shaft, First Seam, 28 to 34 in. thick.
PO—Centerville, Ia. SP—Same. CTY Appanoose. RR—C.B.&Q., C.R.I. &P.
PR—John Peterson. . Centerville, Ia.
TR—Louis Anderson....Centerville, Ia.
GM—Louis Anderson, " "
PA—Louis Anderson, " "
MF—John Sieren, " "
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—2 Ottumwa boilers, total 120 H. P.
EMP—120. Last fiscal year output 43,000 tons.

CENTERVILLE BLOCK COAL CO.
General Office, Centerville, Ia.
PR—C.W. Lane, ... Centerville, Ia.
TR—W.W. Oliver, " "
GM—W.W. Oliver, " "

(Continued on Next Page.)

Centerville Block Coal Co.—Cont.
Secy—W. W. Oliver....Centerville, Ia.
GS—Alex Dargavell, " "
PA—Alex Dargavell, " "
EM—W.C. Wyman, " "
MM—John D. Miller, " "
Sales Mgr—W. W. Oliver, " "

No. 1 Mine; Shaft; First Seam 32 to 36 in. thick.
PO—Centerville, Ia. SP—Same. CTY—Appanoose. RR—C.R.I.&P.
MS—Wm. Bitner, ...Centerville, Ia.
S of H—Mules and rope. Track gauge 36 in.
S of M—Hand.
PP—3 return tubular boilers, total 325 H.P., 1 Norwalk compressor, 2 pumps.
EMP—96. Last fiscal year output 29,967 tons.

No. 2 Mine, Shaft, Low Coal Field Seam, 28 to 32 in. thick.
PO—Numa, Ia. SP—Same. CTY—Appanoose. RR—C.R.I.&P.
MS—Wm. Allen, ... Numa, Ia.
S of H—Mules and rope; track gauge 36 in.
S of M—Hand.
PP—1 return tubular boiler, total 60 H.P., 1 pump.
EMP—75. Last fiscal year output 23,688 tons.

No. 10 Mine; Shaft, Low Coal Field Seam, 36 in. thick.
PO—Centerville, Ia. SP—Same. CTY—Appanoose. RR—C.R.I.&P. ..
MS—Robt. Easton......Centerville, Ia.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—2 boilers total 170 H. P., 2 pumps.
EMP—130. Last fiscal year outputt 45,926 tons.

No. 9 Mine; Shaft, Low Coal Field Seam, 32 to 34 in. thick.
PO—Centerville, Ia. SP—Same. CTY Appanoose; RR—Cent. & Albia. Traction connecting with M.&St. L. at Albia, Ia.
S of H—Mules. Track gauge 38 in.
S of M—Hand
PP—3 boilers, total 240 H.P., 1 Norwalk air compressor. Mine shut down April 1st, 1912, not running for the past three years.

No. 3 Mine, Relay, Shaft, "Centerville" or "Mystic Low Coal Field" Seam 30 to 36 in. thick.
PO—Centerville, Ia. SP—Same. CTY—Appanoose. RR—C.B.&Q.
MS—John Mockey......Centerville, Ia.
S of H—Mules and rope. Track gauge 38 in.
S of M—4 Comp. air mach. and hand.
PP—3 Boilers, total 370 H. P. 1 air compressor, 2 pumps.
EMP—80. Last fiscal year output 25,000 tons.

No. 5 Mine, Slope, Low Coal Field First Seam, 30 in. thick.
PO—Brazil, Ia. SP—Same. CTY—Appanoose. RR—C.B.&Q.
MS—Jas. Hunter, ... Mystic, Ia.
S of H—Rope and mules; track gauge 38 in.
S of M—Hand, Long Wall System.
PP—2 boliers, total 120 H.P., 1 pump.
EMP—90. Last fiscal year output 40,282 tons.

CENTRAL COAL CO.
Lockman Nos. 2, 3 and 5 Mines; Slope; Seam 42 to 60 in. thick.
PO—Lockman, Ia. SP—Same and Hickory, Ia.; CTY—Monroe; RR—M. &St. L.
PR—S.H. Evans, ... Lockman, Ia.
TR—T.L. Evans, " "
GM—T.L. Evans, " "
PA—T.L. Evans, " "
GS—T. L. Evans........Lockman, Ia.
MS—J. D. Clark, " "
SCO—Lockman Supply Co., Buyer, R. G. Harris, Lockman, Ia.
S of H—Mules and wire rope. Track gauge 36 in.
S of M—Hand.
PP—4 Murray Iron Works boilers.
EMP—250.

CENTRAL IOWA FUEL CO.
Inland and Olmitz Mines; Shaft; Seam 72 in. thick.
PO—Chariton, Ia.; SP—Same; CTY—Lucas; RR—C. R. I. & P., Kansas City Branch.
PR—A. E. Hollingsmith, Des Moines, Ia.
VP—J. Norwood, " " "
GM—J. Norwood, " " "
TR—F. C. MacMillan, " " "
S of H—2 Gasoline loco.
S of M—Hand.

CITIZENS COAL CO.
Shaft Mine; Thin Vein; 28 in. thick.
PO—Centerville, Ia.; SP—Same; CTY—Appanoose; RR—Sou. Ia. Inter Elec.
PR—D. A. Lee, ...Centerville, Ia.
TR—D. A. Lee, " "
GM—D. A. Lee, " "
PA—D. A. Lee, " "
GS—Harry Parker, " "
S of H—Mules.
S of M—1 Elec. mach.
PP—Gen. unit 220 volts A. C., 3 phase, 60 cycles. Purchase power.
EMP—20. Last fiscal year output 9,600 tons.

COAL CITY COAL COMPANY.
See Big Block Coal Co.

COALFIELD FUEL COMPANY.
See Bloomfield & Bloomfield.

COLFAX CONSOLIDATED COAL CO.
Mines Nos. 8 and 9, Shafts, Seam 2½ to 6 ft. thick.
PO—Colfax, Ia. SP—Same. CTY—Jasper. RR—C.R.I.&P., C.N., C. G. W., I. U.
PR—W. A. Seevers.......Coalfax, Ia.
TR—J. B. Ryan ....Colfax, Ia.
GM—J.B. Ryan, " "
PA—Thos. H. Gould, " "
MS—John Pearson........Colfax, Ia.
SM—H. A. Gunn " "
EE—B. Winterstein, " "
S of H—Mules and 4 Elec. loco.
S of M—4 elec. mach and hand.
PP—5 water tube boilers, 2 gen. units, 250 volts, D. C., 2 pumps.
EMP—600.

CONSOLIDATED INDIANA COAL CO.
Stewart K. Smith, receiver, 343 S. Dearborn St., Chicago, Ill.
1 mine in Iowa, 3 mines in Indiana.
Electra Mine; Shaft; Electra Seam, 48 to 78 in. thick.
PO—Melcher, Ia. SP—Same. CTY — Marion. RR—C.R.I.&P.
PA—H. E. Rhein.........Chicago, Ill.
MS—Harry Evans........Melcher, Ia.
S of H—8 elec., 1 gasoline loco and hand. Track gauge 36 in.
PP—2 Oil City water tube boilers, total 500 H. P., 1 turbine and 2 motor gen. sets, 2300 volts A. C., 3 phase, 60 cycles, 1 pump.
EMP—300. Last fiscal year output 18,897 tons.

CONSOLIDATION COAL CO.
General Office, Buxton, Ia.
Nos. 16 and 18 Mines; Shaft; Seam 48 to 86 in. thick.
PO—Milrose, Ia.; SP—Consol; CTY—Monroe; RR—C. & N. W., I. and M. Div.
TR—A. B. Jones.........Chicago, Ill.
PA—L. S. Carroll, " "
EE—A. A. Davis..........Melrose, Ia.
GS—John P. Reese, ...Gillespie, Ill.
EM—F. F. Jorgensen, " "
CE—W. E. Dunham, ..Winona, Minn.
MS—Joe Davis...........Buxton, Ia.
..**SCO**—Munroe Mercantile Co., Buxton, Ia.
S of H—5 elec. loco. and mules; track gauge 36 in.
S of M—Hand.
PP—8 National water tube boilers, total 1,000 H. P., 2 gen. units, 250 volts D. C., 1 pump.
EMP—600. Last fiscal year output 339,465 tons.

CONSUMERS COAL CO.
Sold to the Harkes Coal Co.

CRESCENT COAL CO.
General Office, Oskaloosa, Ia.
PR—S. W. White........Oskaloosa, Ia.
GM—S.W. White, ... Oskaloosa, Ia.
PA—S.W. White, " "
TR—J. E. Hatfield......Oskaloosa, Ia.
GS—Wm. Ross,.........Whiteburg, Ia.
CE—O. H. Lohmann, " "
EM—O. H. Lohmann, " "
SCO—Crescent Supply Co. Buyer, Leonard Duqrez, Whiteburg, Ia.

Mine No. 7, Shaft, Seam 48 to 72 in. thick.
PO—Whiteburg, Ia.; SP—Buxton, Ia.; CTY—Monroe; RR—C. & N. W., I. & M. Div.
MS—R. T. Davis.......Whiteburg, Ia.
S of H—Mules.
S of M—Hand.
PP—2 Return tubular boilers, 200 H. P.
EMP—300. Last fiscal year output, 135,400 tons.

CRICKET COAL CO.
Out of business.

CROATIAN COAL CO.
Now Gold Goose Coal & Mining Co.

DALLAS COAL CO.
General Office, Crocker Bldg., Des Moines, Ia.
No. 1 Mine; Shaft; Seam 36 to 58 in. thick.
PO—Granger, Ia.; SP—Same; CTY—Dallas; RR—C. M. & St. P., Madrid Branch.
PR—John Lindblom.....Des Moines, Ia.
GM—A. W. Carlson, Jr. " "
PA—A. W. Carlson, Jr. " "
MS—John Lindblom, " "
EM—L. L. Leibrock, " "
EE—J. W. Peterson.......Madrid, Ia.
S of H—Mules (at present); track gauge 42 in.
PP—Power purchased.
EMP—110. Last fiscal year output 48,000 tons.
Sales Agent, A. W. Carlson, Des Moines, Ia.

DAWSON, T. H. COAL CO.
General Office, Fort Dodge, Ia.
PR—T. H. Dawson.....Fort Dodge, Ia.
GM—T. H. Dawson, " "
PA—T. H. Dawson, " "
TR—T.H. Dawson, " "
GS—Wm. Dawson...........Otho, Ia.
EE—H. Dawson............Otho, Ia.

Cannel Mine; Slope; "Cannel" Lower Seam; 28 to 32 in. thick .
PO—Otho, Ia.; SP—Kolo; CTY—Webster. RR—M.&St. L.
MS—Wm. Dawson..........Otho, Ia.
S of H—Mules and Elec. loco.; track gauge 32 in.
S of M—Hand.
PP—4 gen. units, 440 volts A. C., 3 phase, 25 cycles, 1 pump. Power purchased.
EMP—25. Last fiscal year output 9,134 tons.

DEEP VEIN COAL CO.
Now Prospect Coal Co.

DIAMOND BLOCK COAL CO.
No. 12 and 29 mines.
PO—Mystic, Ia.; SP—Same; CTY—Appanoose; RR—C. M. & St. P.
PA—Lodwick Bros. Coal Co..Mystic, Ia.
Sales Agency, Lodwick Bros. Coal Co., Mystic, Ia.

DES MOINES COAL CO.
Iowa Mine, Shaft, Seam 5 ft. thick.
PO—Des Moines, Ia. SP—Same. CTY—Polk. RR—C. G. W.
PR—J.S. Henderson,. Oskaloosa, Ia.
TR—S.T. Slade, .. Des Moines, Ia.
GM—E. M. Gray, " "
PA—E. M. Gray, " "
MS—C. Anderson, " "
EM—C. Anderson, " "
S of H—Mules. Track gauge 2 ft. 8 in.
S of M—Hand and 2 elec. mach.
PP—2 water tube boilers.
EMP—175. Last fiscal year output 108,381 tons.

DOMESTIC COAL CO.
PO—Cincinnati, Ia. SP—Same. CTY—Appanoose.
MS—Walter Hall, ...Cincinnati, Ia.

EAGLE COAL MINING CO.
General Office, Des Moines, Ia.
PR—D.E. Sayre, ... Des Moines, Ia.
TR—H.A. Sayre, " "
GM—E.A. Sayre, " "
GS—E.A. Sayre, " "
PA—E. A. Sayre, " "
EM—E. A. Sayre, " "

Eagle No. 2 Mine, Shaft, No. 3 Seam, 36 to 84 in. thick.
PO—Des Moines, Ia. CTY—Polk.
MS—J. J. Hector.......Des Moines, Ia.
S of H—Mules. Track gauge 30 in.
S of M—Hand.
PP—2 water tube boilers, total 160 H. P., 1 pump.
EMP—65.

Eagle No. 3 Mine, Shaft, No. 3 Seam, 36 to 56 in. thick.
PO—Des Moines, Ia. CTY—Polk.
MS—Frank Burris, .. Des Moines, Ia.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—2 water tube boilers, total 160 H. P., 2 pumps.
EMP—95.

ECONOMY COAL CO.
Mine worked out.

EGYPT COAL CO.
Egypt Mine, Slope, Central Seam 30 in. thick.
PO—Mystic, Ia.; SP—Same; CTY—Appanoose; RR—C. M. & St. P.
PR—A. V. Venell........Mystic, Ia.
TR—A. B. Dudley, " "
MS—R. Venell, " "
S of H—Rope; track gauge 30 in.
S of M—3 Elec. mach.
PP—Purchase power, alternating current
EMP—90. Last fiscal year output 35,710 tons.
Sales Agent, A. B. Dudley, Mystic, Ia.

EMPIRE MINING CO.
Now Mammoth Vein Coal Co.

ENGLISH CREEK COAL COMPANY.
General Office, Knoxville, Ia.
Mine Na. 3; Shaft; Seam 48 to 84 in. thick.
PO—Knoxville, Ia. SP—Same. CTY—Marion. RR—C. R. I. & P., Knoxville branch.
PR—Geo. H. Ramsay, .. Knoxville, Ia.
TR—H. S. Howard, .. Oskaloosa, "
GM—J. H. Ramsay, Des Moines, "
SUPT—Ed. Rowley.......Knoxville, Ia.
PA—R. W. Varley, " "
MM—Chas. Fisher, " "
SCO—English Creek Supply Co. Buyer, R. C. Ramsay, Knoxville, Ia.
S of H—2 elec. loco. Track gauge 36 in.
S of M—2 elec. mach.
PP—Boilers, total 500 H. P., 3 pumps, 1 air comp.
EMP—200. Last fiscal year output 104,934 tons.

ENTERPRISE COAL MNG. CO.
General Office, Des Moines, Ia.
Enterprise Nos. 1 and 2, Shaft, Seam 3½ to 5 ft. thick.
PO—Enterprise, Ia. SP—Same. CTY—Polk. RR—C.R.I.&P., Short Line.
PR—H.F. Garver, .. Des Moines, Ia.
TR—H.F. Garver. " "
GM—H. F. Garver ....Des Moines, Ia.
PA—H.F. Garver, " "
SECY—C.M. Garver, " "
MS—C.W. Carpenter, Enterprise, Ia.
SCO—Saylor Supply Co. Buyer, E. C. Johnson, Enterprise, Ia.
S of H—Mules, 2 elec. and 3 gasoline locos.
S of M—Hand.
PP—9 return tubular boilers.
EMP—450. Last fiscal year output 254,990 tons.

EQUALITY COAL CO.
Cricket Mine; Shaft; Seam, 48 to 72 in. thick.
PO—Lovilia, Ia.; SP—Buxton, Ia.; CTY—Munroe; RR—C. & N. W.
PR—L. A. Walraven,......Lovilia, Ia.
TR—Earle Brown, " "
PA—Earle Brown, " "
MS—Earle Brown, " "
EM—Frank Van Blair, " "
CE—L. L Leibrock,....Des Moines, Ia.
SCO—Cricket Supply Co. Buyer, W. A. Johnson, Lovalia, Ia.
S of H—Mules and rope. Track gauge 36 in.
S of M—Hand.
PP—2 water tube boilers, 3 pumps.
EMP—50. Last fiscal year output 23,560 tons.

EVANS, GOMER
Madrid, Ia. No report.

EXCELSIOR COAL & MINING CO.
Excelsior No. 2 Mine; Shaft, 36 to 72 in. thick.
PO—Oskaloosa, Ia.; SP—Hickory, Ia.; CTY—Monroe; RR—M. & St. L.
PR—Jno. Ramsay, Sr., Oskaloosa, Ia.
TR—H. H. Harris, " "
GM—H. H. Harris, " "
SCO—Morgan Bros. Co.......Avery, Ia.
S of H—Rope. Track gauge 3 ft.
S of M—Hand.
PP—2 water tube boilers.
EMP—150. Last fiscal year output 80,000 tons.
Sales Agent, H. H. Harris..Ottumwa, Ia.

EXLINE COAL CO.
Nos. 1 and 2 Mines, Shaft.
PO—Exline, Ia. SP—Same. CTY—Appanoose. RR—C.B.&Q.
GM—A. N. John...........Exline, Ia.
PA—A. N. John............Exline, Ia.
MS—John Clarke..........Exline, Ia.
S of H—Mules.
S of M—Hand.
PP—Boiler, 60 H.P.

FOWLER & WILSON COAL CO.
General Office, Ottumwa, Ia.
Rathbun Nos. 1 and 2, Shaft and Slope, Seam 36 in. thick.
PO—Rathbun, Ia.; SP—Same. CTY—Appanoose. RR—C.M.&St. P.
PR—E.D. Fowler, ... Ottumwa, Ia.
GM—E.D. Fowler, " "
PA—E.D. Fowler, " "
TR—W.T. Wilson, " "
GS—D. F. Cushing........Rathbun, Ia.
MS—Sidney Voyce........Rathbun, Ia.
SM—C.R. Mill. " "
S of H—Mules and rope; track gauge 36 in.
S of M—Hand.
PP—3 Return tubular boilers, total 380 H. P.; 1 pump.
EMP—252. Last fiscal year output 84,763 tons.

GARFIELD COAL CO.
Out of business.

GIBSON COAL MINING CO.
Gibson No. 5 Mine, Shaft, No. 3 Seam, 3½ to 4½ ft. thick.
PO—Des Moines, Ia. SP—Clive, Ia. CTY—Polk. RR—C.M.&St.P.
PR—John B. Gibson, Des Moines, Ia.
TR—John B. Gibson, " "
GM—John B. Gibson, " "
PA—John B. Gibson, " "
MS—W.R. Gibson, " "
SM—F.W. Gibson, " "
S of H—Gasoline locos. Track gauge 3 ft.
S of M—Hand.
PP—3 water tube boilers.

GOBEN COAL COMPANY.
Goben Mine, Shaft, Seam 2 ft. thick.
PO—Lucas, Ia. CTY—Lucas. RR—C.B. &Q.
PR—Geo. W. Goben, ... Lucas, Ia.
MS—Geo. W. Goben, " "
S of H—Mules.
S of M—Hand.
PP—1 boiler, 40 H. P., 1 pump.
EMP—5.

GOLD GOOSE COAL & MINING COMPANY.
General office, Albia, Ia.
Gold Goose Mine; Shaft; 42 to 72 in. thick.
PO—Albia, Ia; SP—Same; CTY— Monroe; RR—C. B. & Q.
PR—M. C. Falvey,.........Albia, Ia.
TR—Wm. F. Richmond, " "
GM—G. A. Morrow, " "
GS—G. A. Morrow, " "
MS—John Malytie, " "
S of H—Mules and steam hoist.
Note—Formerly the Croatian Coal Co.

GRANT COAL CO.
Out of business.

GREEN RIDGE FUEL CO.
Mine worked out.

HARKES COAL COMPANY.
General Office, Keith & Perry Bldg., Kansas City, Mo.
Mine No. 1, Shaft, No. 2 Seam, 36 to 40 in. thick.
PO—Jerome, Ia SP—Same. CTY — Appanoose. RR—C.M. & S.P., Kansas City Div.
PR—Wm. Harkes.....Kansas City, Mo.
TR—C. Whalin, " "
EM—Wm. Harkes, " "
PA—Robert Hunter........Jerome, Ia.
GS—Robert Hunter, " "
S of H—Mules. Track gauge 31 in.
S of M—Hand.
PP—2 Ottumwa return tubular boilers, total 200 H. P., and 1 pump.
EMP—146. Last fiscal year output 51,331 tons.

HEAPS COAL CO.
Walnut Grove, Shaft, Seam 3 ft. thick.
PO—Boone, Ia. SP—Same. CTY — Boone. RR—C.&N.W.
PR—Robert Heaps, ... Boone, Ia.
TR—Thomas Hughes, " "
MS—Thomas Hughes, " "
S of H—Mules.
S of M—Hand.
PP—2 pumps.
EMP—125. Last fiscal year output 40,000 tons. Sales agent, J. W. Borts, Boone, Ia.
(Old information.)

HIGH BRIDGE COAL CO.
High Bridge Mine, Shaft, Seam 4 ft. thick.
PO—Madrid, Ia. SP—High Bridge, Ia. CTY—Dallas, RR—C. M. St. P.
PR—Mrs. Julia A. Carlson, Des Moines, Ia.
CM—A. W. Carlson..Des Moines, Ia.
PA—A. W. Carlson, " "
MS—John Lindblom, " "
TR—G. W. Rask, High Bridge, "
EE—I.W. Peterson, " "
SCO—High Bridge Supply Co. Buyer, C. M. Stiver, High Bridge, Ia.
S of H—2 elec. locos. Track gauge 3 ft.
S of M—Hand.
PP—2 return tubular boilers, 1 generating unit, 2 pumps.
EMP—180. Last fiscal year output 100,569 tons. Sales agent, A. W. Carlson, Des Moines, Ia.

HOCKING COAL CO.
Nos. 3 and 4 Mines; Shaft; Bituminous Seam, 42 to 84 in. thick.
PO—Hocking, Ia.; SP—Same; CTY—Monroe; RR—M. & St. L.
PR—Newman Erb, Minneapolis, Minn.
GM—C. W. Huntington, Minneapolis, Minn.
PA—W.G. Manchester, " "
EM—W.G. Hodge, ... Hocking, Ia.
MS—W.G. Hodge, " "
MM—Isaac Jones, " "
EE—Isaac Jones, " "
SCO—Hocking Supply Co., buyer W.D. Ramsay, Hocking, Ia.
S of H—6 Elec. and 1 gasoline loco., mules and rope; track gauge 36 in.
S of M—Hand.
PP—10 Return tubular boilers, total 1200 H. P., 2 gen. units 500 volts D. C., and 3 pumps.
EMP—500. Last fiscal year output 294,322 tons.
Sales agent, Richard Rose..Hocking, Ia.

HOOVER FUEL COMPANY.
General Office, Lakonta, Ia.
Hoover Mine; Shaft; Seam 84 to 90 in. thick.
PO—Albia, Ia.; CTY—Monroe; RR—C. & N. W.
PR—J. M. Timbrell, .. Lakonta, Ia.
TR—C. E. Lofland.....Oskaloosa, Ia.
GM—E.M. Baysoar, ... Albia, "
MS—E.M. Baysoar, " "
PA—E.M. Baysoar, " "
EM—M. Wright............Albia, Ia.
MM—T. O. Grier...........Albia, Ia.
SCO—Monroe Mercantile Co., Buxton, Ia.
S of H—2 gasoline loco.; track gauge 42 in.
S of M—Hand.
PP—2 return tubular boilers, total 300 H.P., 1 pump.
EMP—200. Last fiscal year output 100,000 tons. Sales Agent, Iowa Coal Washing Co., Lakonta, Ia.

INTER OCEAN COAL COMPANY
No. 6 Mine; Shaft; Walnut Block Seam; 28 in. thick.
PO—Mystic, Ia.; SP—Same; CTY—Appanoose; RR—C. M. & St. P.

PR—James Horridge.......Mystic, Ia.
GM—James Horridge, " "
PA—James Horridge, " "
TR—Geo. Porter, " "
MS—J. T. Armstrong, " "
PP—1 return tubular boiler.
S of H—Mules.
EMP—35. Last fiscal year output 1,200 tons.

IOWA BLOCK COAL CO.
Iowa Block Mine No. 1, Shaft, Block Field Seam, 30 to 34 in. thick.
PO—Exline, Ia. SP—Same. CTY—Appanoose. RR—C.B.&K.C.
PR—S.P. Maring, ... Exline, Ia.
TR—L. Johnson, " "
GM—L. Johnson, " "
PA—L. Johnson, " "
MS—Ed. Biggie, " "
CE—Hall-Adams, ... Centerville, "
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—2 return tubular boilers, total 120 H.P.
EMP—150. Last fiscal year output 40,000 tons. Sales Agent, O. E. Anderson, Exline, Ia

JOHNSTON, TOM, COAL MINES.
Out of business.

JOHNSON, W D , COAL CO.
No. 2 Mine, Shaft, 2nd Seam, 2½ to 3½ ft. thick.
PO—Boone, Ia. SP—Same. CTY—Same. RR—C.&N.W.
PR—W.D. Johnson, ... Boone, Ia.
TR—H.H. Canfield, " "
GM—H.H. Canfield, " "
PA—H.H. Canfield, " "
SCO—W.D. Johnson & Co.,buyer, C. C. Canfield, Boone, Ia.
MS—Andrew Johnson, " "
EM—Jas. Watson, " "
S of H—Mules. Track gauge 30 in.
S of M—Hand.
PP—3 return tubular boilers, total 180 H.P., 1 pump.
EMP—125. Last fiscal year output 26,199 tons.

JUDY COAL CO. (THE)
Judy Mine; Shaft; No. 3 Seam, 30 in. thick.
PO—Diamond, Ia.; SP—Mystic, Ia.; CTY—Appanoose; RR—C. M. & St. P.
PR—D. A. Lee, ...Centerville, Ia.
GM—D. A. Lee, " "
PA—D. A. Lee, " "
MS—A. W. Judy, " "
EE—A. W. Judy, " "
S of H—Rope and mules.
S of M—3 Elec. mach.
PP—Power purchased.
EMP—80-100.

MOREY CLAY PRODUCTS CO.
Out of business.

MYSTIC COAL CO.
Mystic, Ia. No report.

KEYSTONE COAL MINING CO.
Keystone Mine, Shaft, No. 3 Seam, 2 ft. 10 in. to 4 ft. 2 in. thick.
PO—Des Moines, Ia. SP—Same. CTY—Polk. RR—C.M.&St.P.
PR—T.W. Carpenter, Des Moines, Ia.
TR—T.W. Carpenter, " "
GM—T.W. Carpenter, " "
PA—T.W. Carpenter, " "
MS—Geo. Heaps, Sr.
EM—B.H.Shires.....Des Moines, Ia.
S of H—Mules and rope; track gauge 36 in.
S of M—4 elec. machines.
PP—2 return tubular boilers, total 160 H.P. Buy elect. power. 1 pump.
EMP—56. Last fiscal year output 60,000 tons.

LAKONTA COAL CO.
Out of business.

LODWICK BROS. COAL CO.
Mines Nos. 3, 12, 22, 29. Seams 28 to 32 in thick.
PO—Mystic, Ia.; SP—Same; CTY—Appanoose; RR—C. M. & St. P., C. B. & Q.
PR—J. B. Lodwick..........Mystic, Ia.
TR—L.L. Lodwick, ... Mystic, Ia.
GM—David Lodwick, " "
MS—David Lodwick, " "
PA—David Lodwick, " "
SM—W. Price, " "
CE—G.S. Lodwick, " "
SCO—Lodwick Supply Co., Mystic, Ia. Buyer, A.J. Carter, Mystic, Ia.
S of H—Mules, steam loco. and rope; track gauge 31 in.
S of M—Hand and 4 elec. mach.
PP—1 air compressor, 4 pumps, power purchased.
EMP—400. Last fiscal year output 170,000 tons.

LONG & SONS COAL CO.
Out of business.

McCLURE, SAM, COAL CO. THE
Out of business. Coal exhausted.

M AND ST.—L. COAL COMPANY.
General office, Lockman, Iowa.
No 1 mine; Shaft; 42 to 60 in. thick.
PO—Lockman, Ia; SP—Hickory, Ia; CTY—Monroe; RR—M. & St. L.
GS—Wm. B. Clouse......Lockwood, Ia.
PA—Wm. B. Clouse.
GM—Wm. B. Clouse.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
EMP—25. Daily output, 100 tons.

MADISON COAL COMPANY.
Madison Mine, Shaft, Seam 3½ to 4½ ft. thick.
PO—305 7th St., Des Moines, Ia. CTY—Polk.
PR—W. F. Moore......Des Moines, Ia.
GM—W. F. Moore .....Des Moines, Ia.
PA—W. F. Moore......Des Moines, Ia.
TR—W.F. Moore, " "
MS—C. E. Moore. " "
S of H—Mules. Track gauge 32 in.
S of M—Hand.
PP—2 return tubular boilers, total 160 H.P., 1 pump.
EMP—60 to 100. Last fiscal year output 22,000 tons.

MAMMOTH VEIN COAL COMPANY
Nos. 11 & 13 Mines; Slopes; 48 to 120 in. thick.
PO—Everist, Ia.; SP—Tracy; CTY—Marion; RR—Wabash.
PR—J. A. J. Powers.......Everist, Ia.
TR—J. A. J. Powers, " "
GS—J. A. J. Powers, " "
PA—J. A. J. Powers, " "
EM—J. M. Smith, " "
MM—H. Nicholson, " "
EE—H. P. Fleenor, " "
SM—Chet C. Johnson, " "
SCO—Everist Merc. Co., " "
S of H—Mules and 3 elec. locos. Track gauge 36 in.
S of M—Hand.
PP—4 water tube boilers, 2 gen. units, 250 volts D. C., 2 pumps.
EMP—150. Last fiscal year output 80,000 tons.

MAPLE BLOCK COAL CO.
Maple Block Mine, Shaft, 3rd Seam 4 ft. thick.
PO—Des Moines, Ia.; SP—Same; CTY—Polk; RR—C. R. I. & P.
PR—Chas. Shuler......Davenport, Ia.
TR—John Shuler......Des Moines,, Ia.
GM—H. M. Shuler, " "
PA—H. M. Shuler, " "
MS—H. M. Shuler, " "
EM—J. E. Thomas, " "
EE—J. E. Thomas, " "
S of H—Mules and 2 elec. loco.; track gauge 36 in.
S of M—Hand.
PP—2 return tubular boilers, total 300 H. P., 1 pump.
EMP—140. Output 135,000 tons.
Sales Agent, John Shuler,, Des Moines, Ia.

MAPLE COAL CO.
General Office, Des Moines, Ia.
No. 1 Mine; Shaft; Seam 48 to 60 in. thick.
PO—Eddyville, Ia.; SP—Same; CTY—Monroe; RR—C. & N. W.
PR—H. M. Shuler......Des Moines, Ia.
TR—H. M. Shuler, " "
GM—H. M. Shuler, " "
GS—H. M. Shuler, " "
PA—H. M. Shuler, " "
MS—Clarence Chapman, Eddyville, Ia.
SCO—Hillabidle Bros., " "
S of H—Mules; track gauge, 36 in.
S of M—Hand.
PP—2 Return tubular boilers, total 300 H. P., and 1 pump.
EMP—285. Last fiscal year output 168,000 tons.
Sales Agency, Northwesern Coal Co.

MARTIN BLOCK COAL CO.
Shaft Mine.
PO—Numa, Ia.; SP—Same; CTY—Appanoose; RR—G. R. I. & P.
GM—J. W Martin..........Numa, Ia.
PA—J. W. Martin, " "
MS—H. W. Fox, " "
SB—John Martin, " "
S of H—Mules.
S of M—Hand.
PP—3 boilers.
Capacity 500 tons per day.

NATIONAL UNION COAL MINING CO.
General Office, Ward, Ia.
Ward Mine No. 1 Shaft; Lower Seam, 48 to 72 in. thick.
PO—Ward, Ia.; SP—Albia, Ia.; CTY—Monroe; RR—C. B. & Q.
PR—John K. Shaw....Baltimore, Md.
TR—W. L. Cooney, " "
GM—G. W. Hartsuck.....Ward, Iowa
PA—G. W. Hartsuck, " "
MM—Frank Efner, " "
MS—G. W. Hartsuck.........Ward, Ia.
SCO—Ward Supply Co., Buyer W. G. Hartsuck, Ward, Iowa.
S of H—Mules and 2 gasoline locos; track gauge 36 in.
S of M—Hand.
PP—3 return tubular boilers, total 260 H. P., 2 pumps.
EMP—300. Last fiscal year output 100,000 tons.
Sales Agent, A. R. Stone, Albia, Ia.

NEW MARKET COAL CO.
New Market, Ia. No report.

NEW ORIENTAL COAL COMPANY.
Oriental Mine; Slope; Appanoose Seam; 28 in. thick.
PO—Brazil, Ia; SP—Same; CTY—Appanoose; RR—C. B. & Q.
PR—Tom Firley,..........Brazil, Ia.
GM—Tom Firley, " "
TR—Joe Miller, " "
GS—Joe Miller. " "
MM—W. B .Marshell, " "
S of H—Mules and rope.
PP—1 boiler, total 60 H. P., 1 air compressor.
Last fiscal year output, 16000 tons.
Note—Formerly known as the New Oriental Coal & Mining Co.

NEW ORIENTAL COAL & MINING CO.
See New Oriental Coal Co.

NEWTON COAL CO.
Newton Mine, Shaft, Seam 4 ft. to 6 ft. 2 in. thick.
PO—Newton, Ia.; SP—Same; CTY—Jasper; RR—C. R. I. & P.
PR—U. G. Brown........Newton, Ia.
GM—U. G. Brown..........Newton, Ia.
TR—Dr. H. J. Joy, " "
PA—U. G. Brown, " "
MS—Jas. Flanders.........Newton, Ia.
MM—Wm. Brown, " "
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—1 boiler, 60 H. P., 1 pump.
EMP—38. Last fiscal year output, 15,000 tons.
Sales Agent, U. G. Brown, Newton, Ia.

NORWOOD-WHITE COAL CO.
General Office, Fleming Bldg., Des Moines, Ia.
Nos. 4 and 5 Mines; Shaft; 3rd Seam, 36 to 60 in. thick.
PO—Norwoodville, Ia.; SP—Berwick, Ia.; CTY—Polk; RR—C. G. W., Main Line.
PR—H. M. Poole....Des Moines, Ia.
TR—E. A. Perry, " "
GM—W. B. Causey, " "
PA—W. W. Wilson....Des Moines, Ia.
GS—J. D. Phillips...Norwoodville, Ia.
EM—Bryce Hutchinson....Berwick, Ia.
MM—J. S. Piper, " "
SCO—Norwood Supply Co., Buyer J. W. Neasham, Norwoodville, Ia.
S of H—2 Gasoline motors and mules; track gauge 36 in.
S of M—Hand.
PP—3 Return tubular boilers, total 240 H. P., gen. units 440 volts A. C., 3 phase, 25 cycles, 3 pumps, also purchase power.
EMP—500. Last fiscal year output 306,950 tons.
Sales Mgr. W. W. Wilson, Des Moines. Iowa.

NUMA BLOCK COAL CO. (THE)
See Prairie Block Coal Co.

OGDEN CONSOLIDATED COAL COMPANY.
Nine No. 5, Shaft, Iowa No. 3 Seam; 3½ to 5 ft. thick.
PO—Ogden, Ia.; SP—Same; CTY—Boone; RR—M. & St. L. and Ft. D. D. M. & So.
PR—Homer Loring......Boston, Mass.
TR—F. M. Johnston......Boone, Ia.
GM Phil H. Waterman......Boone, Ia.
PA—Phil H. Waterman " "
GS—P. H. Waterman.......Boone, Ia.
MS—Alf. Neighbors........Ogden, Ia.
S of H—2 elec. loco. and mules. Track gauge 36 in.
S of M—5 elec. mach.
PP—4. pumps; power purchased.
EMP—150. Last fiscal year output 38,053 tons.
Sales Agent, E. C. Smith, Boone, Ia.

OTTUMWA BRICK & CONSTRUCTION CO.
See Morey Clay Products Co.

PEACOCK COAL CO.
Slope Mine; Bituminous Seam; 30 in. thick.
PO—Brazil, Ia.; SP—Same; CTY—Appanoose; RR—C. B. & Q.
TR—Samuel Philby.......Brazil, Ia.
GM—R. F. Lawton, " "
GS—R. F. Lawton, " "
MS—Samuel Philby. " "
S of H—Mule; track gauge 30 inches.

(Continued on Next Page.)

Peacock Coal Co.—Cont.
S of M—Hand.
EMP—32. Last fiscal year output 6,000 tons.

PEERLESS COAL COMPANY.
Mines Nos. 5, 6 and 7, 1 Slope and 2 Shafts; Walnut Block Coal Seam; 30 in. thick.
PO—Mystic, Ia.; SP—Same; CTY—Appanoose; RR—C. M. & St. P.
PR—T. E. Lee.........Centerville, Ia.
GM—T. E. Lee, " "
TR—T. E. Lee, " "
PA—T. E. Lee, " "
S of H—Mules and tail rope; track gauge 31 in.
S of M—Hand and 5 elec. mach.
PP—6 Return tubular boilers total 600 H. P., 3 gen. units, 220 volts, A. C. & D. C., 3 phase and 60 cycles; 3 pumps.
EMP—300. Last fiscal year output 85,000 tons.
Sales Agent, Elec. Coal Co., Mystic, Ia.

PHILLIPS MINING CO.
General Office, Ottumwa, Ia.
PR—Henry Phillips.....Ottumwa, Ia.
GM—Henry Phillips, " "
TR—Philip P. Phillips, " "
GS—A. J. Erskine, " "
PA—H. Woodford, " "
SCO—Black Diamond Store Co., Buyer, H. Benson, Ottumwa, Ia.

Foster Mine, Shaft.
PO—Foster, Ia.; SP—Same; CTY—Monroe; RR—C. M. & St. P.
MS—Wallace Convey.......Foster, Ia.
SM—J. Harter and Claude Shields, Foster, Ia.
S of H—Rope.
S of M—Hand.
PP—4 Return tubular boilers, 1 pump.
EMP—200.

Mine No. 9 Shaft.
PO—Bear Creek, Ia.; SP—Same—CTY—Wapello. RR—C. M. & St. P.
MS—A. J. Ershine......Ottumwa, Ia.
SM—H. Benson, " "
S of H—Rope and mules.
S of M—Hand.
PP—5 Return tubular boilers; 1 Pump.
EMP—250.

Mine No. 10; Shaft; Now leased to Gomer Evans, Madrid, Ia.

PHOENIX COAL CO.
Phoenix Mine, Slope, Seam 28 to 30 in. thick.
PO—Mystic, Ia.; SP—Brazil, Ia.; CTY Appanoose; RR—C. B. & Q.
PR—A. B. Dudley........Mystic, Ia.
TR—A. B. Dudley, " "
GS—A. V. Venell, " "
MS—R. Venell............Mystic, Ia.
S of H—Rope; track gauge 30 in.
S of M—Hand.
PP—1 Water tube boiler.
EMP—80. Mine idle last year on account of business conditions.
Sales Agent A. B. Dudley, Mystic, Ia.

PIGEON CREEK COAL CO.
Pigeon Mine; Shaft; Centerville Seam; 34 to 38 in. thick.
PO—Exline, Ia.; SP—Same; CTY—Appanoose; RR—C. B. & Q., K. C. branch.
PR—D. A. Friel..........Exline, Ia.
TR—C. M. Hughes, " "
GM—Russell Conger, " "
GS—Frank Bratschi, " "
S of H—Rope and gasoline loco.
PP—1 pump.
Note—Developing. Shaft sunk and timbered.
Sales agency, Iowa Block Coal Co.

PRAIRIE BLOCK COAL CO.
Streepy Mine, Centerville Seam 28 to 34 in. thick.
PO—Centerville, Ia.; SP—Same; CTY—Appanoose; RR—C. R. I. & P.
PR—A. G. Widmer....Centerville, Ia.
GM—A. G. Widmer, " "
TR—A. C. Widner.......Centerville, Ia.
MS—Peter Thomas......Seymour, Ia.
Sof H—Elec. loco; track gauge 38 in.
S of M—Elec. mach.
PP—2 Return tubular boilers, 2 gen. units.
EMP—225. Last fiscal year output 110,800 tons.

Mine No. 1, Shaft; Seam 28 in. thick.
PO—Numa, Ia.; SP—Same; CTY—Appanoose; RR—C. R. I. & P.
MS—J R. Boyd...........Numa, Ia.
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—3 Return tubular boilers, total 275 H. P.; 1 pump.
EMP—250. Last fiscal year output 80,000 tons.

Mine No. 2, Shaft; Seam 28 in. thick.
PO—Seymour, Ia.; SP—Same; CTY—Wayne; RR—C. M. & St. P.
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—3 Return tubular boilers, total 275 H. P.; 1 pump.
EMP—250. Last fiscal year output 75,000 tons.

PROSPECT COAL COMPANY.
No. 1. Mine; Shaft; Lower Vein; 40 to 60 in. thick.
PO—Fraser, Ia; SP—Same; CTY—Boone; RR -F. D. & D. S.
PR—Malcolm Reid,...... Fraser, Ia.
MM—Malcolm Reid, ,, ,,
TR—John Coleman, ,, ,,
GS—Geo. Sinclair, ,, ,,
GM—Edw. Showers, ,, ,,
MS—Edw. Showers, " "
PA—C. H. Henle, ,, ,,
CE—Edw. Reed, ,, ,,
EM—C. W. Anderson, ,, ,,
EE—John Shirkle, ,, ,,
SCO—Fraser Mercantile Co. Buyer C. H. Heule.
S of H—Mules. Track gauge 36 in.
PP—2 Return tubular boilers, 2 gen. units, 1 pump.
EMP—15. Last fiscal year output, 1000 tons.
Note—Successors to Deep Vein Coal Co.

RATCLIFF COAL CO.
Ratcliff Mine; Shaft; Seam 3 to 6 ft. thick.
PO—Douds Leondo, Ia.; SP—Same; CTY Van Buren; RR—C. R. I. & P.
PR—John Howard,...Douds Leondo, Ia.
GS—John Howard, " "
MM—John Howard, " "
MS—Landon Erskine, " "
TR—Landon Erskine, " "
PA -A. Everitt, " "
S of H—Mules; track gauge 30 in.
S of M—Hand.
EMP—25. Last fiscal year output 7000 tons.

RAY COAL MINING CO.
Ray Mine, Shaft, 3rd Seam, 4 to 5 ft. 8 in| thick.
PO—Des Moines, Ia.; SP—Same; CTY—Polk; RR—C. B. & Q.
PR—T. A. Ray......Des Moines, Ia.
TR—A. J. Harkins, " "
GM—C. V. Ray, " "
PA—C. V. Ray, " "
GS—T. E. Ray, " "
CE—T. E. Ray, " "
MS—Chas. Hutchinson, " "
S of H—Mules; track gauge 2 ft. 11 in.
S of M—Hand.
PP—2 return tubular boilers, total 200 H. P., 1 pump.
EMP—52. Last fiscal year output 27,600 tons.
Sales Agent, C. V. Ray, Des Moines, Ia.

REGAL COAL COMPANY.
General Office, Oskaloosa, Ia.
Regal No. 3 Mine; Shaft; Seam, 3 to 6½ ft. thick.
PO—R. D. Albia, Ia.; SP—Albia, Ia.; CTY—Monroe; RR -C. N. & W.
PR—J. L. Jones, ...Oskaloosa, Ia.
PA—J. L. Jones, " "
TR—Elizabeth Fraker, " "
MS—W. J. Sullivan...Albia, R. D., Ia.
SCO—Sullivan Supply Co. Buyer, W. J. Sullivan, Albia, Ia.
S of H—Mules; track gauge 3 ft.
S of M—Hand.
PP—2 boilers total 160 H. P.; 1 pump.
EMP—160. Last fiscal year output 100,000 tons. Sales agent, J. L. Jones, Oskaloosa, Ia.

REX FUEL CO.
General Office, Rex, Ia.
Rex No. 2 and 4 Mines; Shafts; Seam 60 ins. thick.
PO—Rex, Ia.; SP—Bussey, Ia.; CTY—Mahaska; RR C. & N. W.
PR—H. L. Spencer, .. Oskaloosa, Ia.
TR—H S. Howard, " "
GM—C. A. Williams.........Rex, Ia.
PA—C. A. Williams, " "
MS—John LaCoste, " "
MM—Sam York, " "
SCO—Rex Supply Co. Buyer, J. P. Melcher, Rex, Ia.
S of H—Rope and Mules. Track gauge 36 in.
S of M—Hand.
PP—3 Frost return tubular boilers, total 375 H. P.
EMP—270. Last fiscal year output 116,221 tons.

RICHARD & CRUICKSHANK COAL CO.
PO—Buxton, Ia.; CTY—Mahaska.
No report.

ROYAL BLOCK COAL CO.
Royal Mine, Slope, S. Ia. Block Seam, 34 to 40 in. thick.
PO—Exline, Ia.; SP—Same; CTY—Appanoose; RR—Burlington & Carrollton Br., C. B. & Q.
GM—P. N. May..........Exline, Ia.
PA—P. N. May, " "
MS—P. N. May, " "
EM—P. N. May, " "
SB—P. N. May, " "
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—2 Return tubular boilers, total 80 H. P., 1 pump.
EMP—40. Last fiscal year output 6,000 tons.

ROYAL COAL CO.
Union Mine, Shaft, Seam 4½ ft. thick.
PO—Oskaloosa, Ia.; SP—Buxton; CTY—Mohoskan; RR—C. N. W., Belle Plaine Branch.
PR—Elizabeth Fraker...Oskaloosa, Ia.
TR—J. L. Jones, " "
GM—J. L. Jones, " "
PA—J. L. Jones, " "
MS—E. A. Richards, " "
S of H—Mules; track gauge 2 ft. 11 in.
S of M—Hand.
PP—Boilers total 80 H. P.
EMP—50. Last fiscal year output 20,000 tons.
Sales Agent, J. L. Jones.

SAYLOR COAL COMPANY.
Saylor No. 2, Shaft; No. 2 and 3 Seams; 3 to 5 ft. thick.
PO—Carney, Ia.; SP—Saylor, Ia.; CTY—Polk; RR—C. & N. W.
PR—W. J. Carney......Chicago, Ill.
TR—Q. Johnstone, " "
GS—J. D. Owen..........Carney, Ia.
GM—K. G. Carney........Carney, Ia.
PA—K. G. Carney..........Carney, Ia.
MS—E. F. Roberts, " "
EM—C. T. Carney, " "
MM—T. J. White, " "
EE—T. J. White..........Carney, Ia.
SCO—Flannery Supply Co., Buyer, J. J. Flannery, Carney, Ia.
S of H—Mules and 5 elec. locos.; track gauge 3 ft.
S of M—Hand.
PP—4 Return tubular boilers, total 500 H. P., 1 gen. unit, 250 volts, D. C.; 2 pumps. Also buy power.
EMP—400. Last fiscal year output 180,000 tons.
Sales Agent, K. G. Carney, Carney, Ia.

SCANDIA COAL COMPANY.
Scandia and Zookspur Mines, Shaft; No. 3 Seam; 2½ to 4 ft. thick.
PO—Madrid, Ia.; SP—Same and Phildia, Ia.; CTY—Boone; RR—C. M. & St. P.
PR—W. J. Carney.......Chicago, Ill.
TR—Quintin Johnstone, " "
GM—F. H. Zook.........Madrid, Ia.
PA—F. H. Zook..........Madrid, Ia.
MS—Owen Reese, " "
EM—G. A. Arnold, " "
SCO—Zook Supply So., and Scandia Supply Co., Madrid, Ia. Buyer, W. L. Davis, Madrid, Ia.
S of H—Mules and 3 elec. loco.; track gauge 3 ft.
PP—3 return tubular boilers, total 300 H. P., 1 gen. unit, 440 volts, D. C.; 1 pump.
Sales Agent, F. H. Zook, Madrid, Ia.

SCANDINAVIAN COAL CO.
Scandinavian No. 2 Mine; Shaft; Centerville Seam, 30 to 36 in. thick.
PO—Centerville, Ia.; SP—Same; CTY—Appanoose; RR—C. B. & Q.
PR—G. P. Polson.....Centerville, Ia.
TR—Claus Johnson, " "
PA—Claus Johnson, " "
S of H—Mules; track gauge 32 in.
S of M—Hand.
PP—2 return tubular boilers, total 140 H. P., 2 pumps.
Note—No. 1 Mine has been abandoned, 5-12-16.

SEYMOUR COAL COMPANY.
Sold to A. G. Widmer of Numa Block Coal Co., and is not being operated.

SIEMAN COAL CO.
See Doud Bros. Coal Co.

SMILEY & HEAPS COAL CO.
PR—Samuel Smiley, Sr.....Boone, Ia.
GM—Samuel Smiley, Jr., " "
TR—Robt. Smiley, " "
PA—Robt. Smiley, " "
Sales Agent Robert Smiley, " "

Mine No. 1 Shaft, Black Jack Seam, 2 ft. 4 in. to 3 ft. 6 in. thick.
PO—Boone, Ia.; SP—Same; CTY—Same; RR—C. & N. W.
MS—Samuel Smiley, Jr.
S of H—Mules; track gauge 2½ ft.
S of M—Hand.
PP—1 pump.
EMP—75. Last fiscal year output 18,000 tons.

Mine No. 2, Shaft, Black Jack Seam, 2 ft. 4 in. to 3 ft. 6 in. thick.
PO—Boone, Ia.; SP—Same; CTY—Same; RR—C. & N. W.
MS—Thomas Adamson.
S of H—Mules; track gauge 2½ ft.
PP—1 pump.
EMP—45. Last fiscal year output 10,000 tons.

SMOKY HOLLOW COAL CO.
General Office, Avery, Ia.
PR—P. H. Hynes.........Avery, Ia.
GM—P. H. Hynes, " "
PA—P. H. Hynes, " "
TR—S. Phillips, " "
CE—H. E. Bennett, " "
EM—H. E. Bennett, " "
GS—Lou Bockman ......Hiteman, Ia.
MM—E. N. Dies..........Hynes, Ia.
SCO—Avery Supply Co., R. M. Clapp, Buyer; Avery, Ia.

No. 9 Mine; Shaft; Bituminous Seam; from 4 to 6 ft. thick.
PO—Avery, Ia.; SP—Same and Chisholm, Ia.; CTY—Monroe; RR—C. B. & Q.
MS—Lou Backman.......Hiteman, Ia.
S of H—Mules and tail rope; track gauge 38 in.
S of M—Hand.
PP—7 Return tubular boilers, total 500 H. P., and 5 pumps.
EMP—100.

No. 10 Mine; Shaft Bituminous Seam, 60 to 72 in. thick.
PO—Hiteman, Ia.; SP—Tower, La.; CTY—Monroe; RR—C. B. & Q., Main Line.
MS—Lou Backman........Haynes, Ia.
S of H—1 Steam loco and mules.
S of M—Hand.
PP—3 Return tubular boilers, total 300 H. P., 1 pump.
EMP—300.
Note—New mine being opened at Hiteman, Ia., to be known as No. 11.

SOUTH DES MOINES COAL CO.
Shaft; No. 3 Seam, 4 to 7 ft. thick.
PO—Des Moines, Ia.; SP—Radium, Ia.; CTY—Polk; RR—I. U.

PR—H. J. Clark.....Des Moines, Ia.
TR—T. H. Hunter......Des Moines, Ia.
GM—T. H. Hunter, " "
PA—T. H. Hunter, " "
MS—S. E. Wagner, " "
EM—B. H. Shivers, " "
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—3 Frost return tubular boilers, total 400 H. P., 1 gen. unit, 220 volts A. C., 3 phase 60 cycles, 1 pump, also purchase power.
EMP—175. Last fiscal year output 75,000 tons.

SPRING HILL COAL COMPANY.
General office, Des Moines, Ia.
Spring Hill Mine; Shaft; 30 to 66 in. thick.
PO—Spring Hill, Ia; CTY -Warren; RR—C. R. I. & P. Winterset Br.
PR—Jos. Muelhaupt....Des Moines, Ia.
TR—John Y. Ross,.. Spring Hill, Ia.
GS—John Y. Ross, ,, ,,
PA—John Y. Ross, ,, ,,
GM—H. B. Ill........Des Moines, Ia.
MS—John Jefferies, Spring Hill, Ia.
S of M—Hand.
PP—2 Frost Water Tube boilers, total 125 H. P., 2 pumps.
Daily output, 150 tons.

SUNDEEN COAL & MINING CO.
Succeeded by Miner's Coal Co.

SUNSHINE COAL COMPANY.
Sunshine Mine, Shaft, Seam 28 to 36 in thick.
PO—Centerville, Ia. SP—Brazil, Ia. CTY—Appanoose. RR—C. B. & Q.
PR—W. S. McKee, .. Centerville, Ia.
TR—Robt. A. McKee, " "
GM—Robt. A. McKee, " "
PA—Robt. A. McKee, " "
MS—D. B. Phillips, " "
CE—D. B. Phillips, " "
S of H—Mules. Track gauge 31 in.
S of M—Hand.
PP—1 pump.
EMP—90. Last fiscal year output 28,000 tons. Sales agent, Robt. A. McKee.

SWANWOOD COAL CO.
Swanwood Mine; Shaft; Bituminous Seam; 42 to 60 ins. thick.
PO—408 E. 6th St., Des Moines, Ia. SP—Swanwood, Ia.; CTY—Polk; RR C. R. I. & P., Short Line.
PR—C. A. Swanson, ..Des Moines, Ia.
TR—Jos. Norwood, "
GM—Jos. Norwood, " "
MS—F. Norwood, " "
PA—A. Reay, " "
S of H—1 gasoline loco. and rope. Track gauge 36 in.
S of M—Hand.
PP—3 boilers.
EMP—200.

THISTLE COAL CO.
Nos. 2, 3 and 4 Mines.
PO—Cincinnati, Ia. SP—Same. CTY—Appanoose.
MS—David Dinning and David Steele, Cincinnati, Ia.
State report.

TRIO COAL COMPANY.
Out of business.

WALNUT BLOCK COAL CO.
Walnut Mine, Drift, Seam 28 in. thick.
PO—Brazil, Ia. SP—Same. CTY—Appanoose. RR—C. B. & Q.
PR—J. R. Plummer........Brazil, Ind.
GM—John Archbold, ... Brazil, Ia.
S of H—Mules. Track gauge 28 in.
S of M—Hand.
EMP—20. Last fiscal year output 7,885 tons.

WAPELLO COAL CO.
Out of business.

WESTERN COAL & MINING CO.
Out of busin.ss.

WHITE ASH COAL COMPANY.
Drift and Slope, No. 4 Seam, 4 to 6 ft. thick.
PO—Avery, Ia. SP—Same. CTY — Monroe. RR—Main Line, C.B.&Q.
PR—Harry Smith, ... Avery, Ia.
GM—Harry Smith, " "
PA—Harry Smith, " "
TR—R. A. Thompson, " "
MS—W. A. Smith, " "
CE—C. Coffin, " "
EM—Harry Eck, " "
MM—F. J. Ruggles, " "
S of H—Mules and rope. Track gauge 34 in.
S of M—Hand.
PP—2 McDaniels return tubular boilers, total 190 H.P., 1 engine, 250 H.P., 2 pumps.
EMP—144. Last fiscal year output 71,321 tons.
Sales Agent, Vick Stark, Avery, Ia.

WHITE OAK COAL CO.
White Oak Mine, Shaft, Seam 28 to 36 in. thick.
PO—Centerville, Ia. SP—Same. CTY—Appanoose. RR—N. & St. L., C. B. & Q.
TR—Robt. A. McKee, Centerville, Ia.
PR—V. S. McKee.
GM—Robt. A. McKee, " "
PA—Robt. A. McKee, " "
EM—H. B. Foster ......Centerville, Ia.
S of H—Mules. Track gauge 30 in.
S of M—Hand.
EMP—50. Last fiscal year output 15,000 tons.

WILLIAMS, W. F., COAL CO.
Out of business.

WINIFRED COAL CO.
Lady Mary Mine; Shaft; Mystic Block Seam, 30 in. thick.
PO—Mystic, Ia.; SP—Same; CTY— Appanoose; RR—C. M. & St. P.
PR—L. L. Lodwick........Mystic, Ia.
TR—T. E. Williams, " "
GM—T. E. Williams, " "
PA—T. E. Williams, " "
GS—T. E. Williams, " "
EE—W. S. Lee, " "
MM—W. E. Jones, " "
EM—G. S. Lodwick, " "
SCO—Winifred Coal Co., " "
S of H—Rope and mules; track gauge 34 in.
S of M—1 Elec., 4 comp. air machs and hand.
PP—2 Ottumwa and Des Moines return tubular boilers, total 150 H. P., gen. unit, 220 volts D. C., 1 compressor, 1 pump. Power purchased.
EMP—120. Last fiscal year output 30,000 tons.

WOODLAND COAL CO.
Woodland Mine; Shaft; 1st Seam; 32 to 36 in. thick.
PO—Centerville, Ia.; SP—Same; CTY—Appanoose; RR—C. R. I. & P., and C. B. & Q.
PR—O. W. Radstrom....Centerville, Ia.
TR—John Eklaf, " "
GM—A. Lofgren, " "
PA—A. Lofgren, " "
GS—A. Lofgren, " "
S of H—Mules; track gauge 32 in.
S of M—Hand.
EMP—14. Last fiscal year output 5,607 tons.

WRIGHT COAL CO.
General Office, Chicago, Ill.
Wright Mine; Shaft; Seam 36 to 48 in. thick.
PO—Carney, Ia.; SP—Saylor, Ia.; CTY—Polk; RR—C. & N. W.
PR—J. Jos. Wright.......Chicago, Ill.
TR—Q. Johnstone , " "
GM—K. G. Carney........Carney, Ia.
PA—K. G. Carney, " "
MS—C. T. Carney, " "
CE—C. T. Carney, " "
EM—C. T. Carney, " "
MM—T. J. White ...... Carney, Ia.
EE—John Bradey, " "
SCO—Owens Mercantile Co., Buyer, M. O. Love, Carney, Ia.
S of H—Mules, 3 elec. locos., track gauge 36 in.
S of M—Hand and 2 Elec. mach.
PP—4 Return tubular boilers, 500 H. P., 1 gen. unit 250 volts D. C., and 3 pumps.
EMP—300. Last fiscal year output 161,237 tons.
Sales Agent, K. G. Carney, Carney, Ia.

KANSAS

For List of Abbreviations See Page 622.

ARCADIA COAL & MINING COMPANY.
Arcadia Coal & Mining Co., Mine; Stripping; 16 to 24 in. thick.
PO—Arcadia, Kan; SP—Arcadia, Kan. & Oskaloosa, Mo; CTY—Crawford; RR—Frisco.
PR—Logan Rivers, ...Arcadia, Kan.
GM—Logan Rivers, " "
PA—Logan Rivers, " "
TR—C. K. Rivers, " "
GS—Vital Lecog, " "
MS—Vital Lecog, " "
S of H 1st am loco. Track gauge 36 inches.
S of M—Steam shovel.
PP—2 boilers, three pumps.
EMP—20.

BESSE-COCKERILL COAL CO.
PR—A. Besse.........Pittsburg, Kas.
SECY—C. C. Cockerill, " "
No report.

BIG SIX COAL CO.
Osage City, Kas. No. report.

BLACK DIAMOND COAL CO.
Shaft; 36 in. thick.
PO—LaCygne, Kas. SP—Same; CTY—Linn; RR—Frisco.
PR—J. T. Kirkendall, La Cygne, Kas.
GM—A. C. King, La Cygne, Kas.
S of H—Mules
S of M—Hand.
PP—One Return Tubular Boiler, Total 30 H. P., 2 Gen. Units. One pump.
EMP—8. Last fiscal year output, 3,000 tons

BLACK DIAMOND COAL COMPANY.
Black Diamond Klondyke Mine Shaft; Osage Deep Seam; 14 to 18 in. thick.
PO—Osage City, Kas. SP—Same; CTY—Osage RR—Mo. Pac. & A. T. & S. F.
PR—E. Nettleblade.. Osage City, Kas.
PA—E. Nettleblade, " "
GS—John Forss, " "
S of M—Hand.
PP—One pump.
EMP—60. Last fiscal year output, 8,000 tons.

BROADHURST & CONGHNOUR COAL CO.
Pittsburg, Kans. No. report.

BURNETT, J. R. COAL & MINING CO. (THE)
Now being operated under lease by Wilson Bros. Coal Co.

CARLSON, S. J. COAL CO.
Osage City, Kas. No report.

CARNEY CHEROKEE COAL CO.
Carney Cherokee Coal Co. Mine; 36 in. thick.
PO—Pittsburg, Kan.; SP—Carney Spur, Mo.; CTY—Crawford; RR—Kansas City, Southern.
PR—W. J. Carney........Chicago, Ill.
TR—O. Johnstone, " "
GM—R. J. Lawrence....Pittsburg, Kan.
MS—J. Swartz, " "
S of H—2 steam locos. Track gauge 36 in.
S of M—Steam shovel.
PP—3 return tubular boilers, total 325 H. P., 3 pumps, 1 air compressor.
EMP—100. Last fiscal year output 65,000 tons.

CARR COAL MINING & MFG. CO. THE
Carr Mine, Shaft, Leavenworth Seam, 24 in. thick.
PO—Leavenworth, Kan. SP—Lansing. CTY—Leavenworth. RR—A. T. & S. F., Mo. P.
PR—Edw. Carroll, . Leavenworth, Kan.
TR—F. E. Carroll, " "
GM—F. E. Carroll, " "
GS—John J. Glynn, " "
PA—John J. Glynn, " "
MS—Chas. Althoff, " "
SM—P. Gontarenitz, " "
CE—J. C. Graham, " "
EE—A. Shierley, " "
S of H—Mules.
S of M—2 elec. mach. and hand.
EMP—185. Last fiscal year output 72,655 tons. Sales agent, J. P. Douglas.

CENTRAL COAL & COKE CO.
General Office, Kansas City, Mo. 9 mines in Kansas, 2 in Missouri, 3 in Wyoming, 2 in Oklahoma and 7 in Arkansas. Operate 2 washeries.
PR—Charles S. Keith, Kan. City, Mo.
VP—H. N. Taylor, " "
TR—E. E. Riley, " "
GS—W. Harkes, " "
CE—J. C. Flaherty, " "
PA—Thos. Mackie, " "
SM—Thos. Mackie, " "

Nos. 42 and 43 Mines, Shaft, Cherokee Seam.
PO—Weir, Kan. SP—Scammon, Kan. CTY—Cherokee. RR—M. K. & T., Frisco.
MS—W. C. Ernhart....Pittsburg, Kans.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—7 boilers.
EMP—310.

Nos. 41, 39, 44 Mines, Shafts. Cherokee Seam.
PO—Weir, Kan. SP—Same. CTY — Cherokee. RR—Frisco.
MS—W. C. Ernhart.....Pittsburg, Kan.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—8 boilers.
EMP—310.

Nos. 45, 48 and 49 Mines; Shaft; Cherokee Seam.
PO—Pittsburg, Kan. SP—Same. CTY—Crawford. RR—Santa Fe, Frisco, Mo., Pac.
MS—D. L. Dunn. .. Pittsburg. Kan.
S of H—Mule and Motors. Track gauge 36 in.
S of M—Hand
PP—4 boilers.
EMP—720.

No. 46 Mine; Shaft; Cherokee Seam.
PO—Pittsburg, Kan. SP—Same. CTY—Crawford. RR—Frisco, Kansas City Sou.
MS—W. C. Enrhart....Pittsburgh, Kan.s
S of H—Mules. Track gauge 36 in.
S of M—Hand
PP—5 boilers.
EMP—75.

CHAPMAN COAL CO.
Out of business.

CHEROKEE-CRESCENT COAL CO.
General Office, Kansas City, Mo.
Roseland Mine; Shaft; Cherokee Seam. 3 ft. 2 in. thick.
PO—Roseland. Kan. SP—Carona, Kan. CTY—Cherokee. RR—Mo. Pac.
PR—I. M. Fleming, Kansas City, Mo.
GS—Geo. Mack.........Pittsburg, Kas.
MS—A. H. Green, ... Roseland, "
CE—L. D. Cornelius, ..Pittsburg, "
PA—L. D. Cornelius, " "
MM—D. R. Cole.........Carona, Kas.
EE—Geo. E Moore, R. 1, Scammon, Kas.
S of H—Mules, 1 elec. and 1 storage battery loco. Track gauge 35 in.
S of M—Hand
PP—2 return tubular boilers, 2 pumps.
EMP—180.

CHEROKEE & PITTSBURG COAL MNG. CO.
See Jackson-Walker Coal & Mining Co.

CLEMENS COAL CO, THE
Nos. 1, 9, 11, 12, 14, 16, and 17 Mines; Shafts and Stripping; Bituminous Seam, 32 to 46 in. thick.
PO—Pittsburg, Kas.; CTY—Crawford; RR—Frisco, K. C. S., A. T. S. F. M. K. T., and Mo. Pacific.
PR—Ira Clemens.......Pittsburg, Kans.
GM—Ira Clemens, " "
PA—Ira Clemens, " "
TR—D. W. Jones, " "
GS—Frank Thomas, " "
MS—Frank Thomas, " "
EM—Thos. Brown, " "
MM—O. A. Hunter, " "
S of H—Mules and 3 steam locos.
S of M—Hand, steam shovels and 1 elec. mach.
EMP—1,000. Last fiscal year output, 39,928 tons.
Sales Agency, The Mackie Clemens Fuel Co.

COLUMBUS COAL CO. (THE)
Seam 36 in. thick.
PO—Columbus, Kan.; SP—Scammon, Kan.; CTY—Cherokee; RR—St. L. & S. F.
PR—C. Newland, ...Stippville, Kan.
TR—C. F. Spencer, ...Pittsburg, Kan.
GM—C. F. Spencer, " "
MS—James Davison, ..Stippville, Kan.
EM—E. B. Crandall, Pittsburg, Kan.
S of H—1 Gasoline motor and mules; track gauge 40 in.
S of M—Hand.
PP—2 Return tubular boilers, total 160 H.P.
EMP—200. Last fiscal year output 100,000 tons.

COUGHLIN COAL CO.
J. F. Graham Mine, Shaft, Bituminous Seam, 16 to 18 in. thick.
PO—Osage City, Kan. SP—Peterton, Kan. CTY—Osage. RR—A. T. & S. F.
GS—John T. Coughlin, Osage City, Kan.
MS—John T. Coughlin, " "
S of H—Mules. Track gauge, 18 in.
S of M—Hand
EMP—15. Last fiscal year output 3150 tons.
Sales agency, Winton Fuel Co.

CROWE, J. R. COAL & MNG. CO. THE
General Office, Dwight Bldg., Kansas City, Mo.
PR—J.R. Crowe, ..Kansas City, Mo.
TR—H. D. Buchanan, " "
GM—R. A. Gray, ... Weir, Kan.
PA—R. A. Gray, " "
EM—E. F. Woodson, " "
Sales agency, Cherokee Fuel Co., Kansas City, Mo.

Mines Nos. 14, 15, and 16, Shafts, "Cherokee" Seam, 2 ft. 10 in. thick.
PO—Croweburg, Kan. SP—Mulberry, Kan. CTY—Crawford. RR—Frisco.
MS—John Gesslein.....Croweburg, Kan.
S of H—Mules. Track gauge 36 in.
S of M—Hand
PP—6 return tubular boilers, total 900 H. P., 4 pumps.
EMP—379. Last fiscal year output 216,606 tons.

Mines Nos. 18, 19, and 20, Shafts; No. 4, Stripping; "Cherokee" Seam, 3 ft. 4 in. to 4 ft. 2 in. thick.
PO—Scammon, Kan. SP—Same. CTY—Cherokee; RR—Frisco and M. K. & T.
MS—W. C. Shank........Weir, Kans.
S of H—Mules. Track gauge 36 in.
S of M—Hand and steam shovel.
PP—7 return tubular boilers, total 875 H.P., 3 pumps.
EMP—438. Last fiscal year output 315,189 tons.

DICKSON & CO.
General Office, Omaha, Neb.
Mine No. 6, Shaft.
PO—Fuller, Kan. SP—Same. CTY — Crawford. RR—Kan. City, Sou.
GM—G. W. Megeath, .. Omaha, Neb.
PA—E. M. Roberts, " "
EM—Jos. Fisher........Mulberry, Kan.
MS—E. M. Roberts, .. Mulberry, "
SM—W. P. Bailey, " "
S of H—Mules.
S of M—Hand
EMP—250.

DOMESTIC FUEL COMPANY.
Mines Nos. 1 & 2; Shaft and Stripping; Pittsburg Seam; 30 to 36 in. thick.
PO—Pittsburg, Kan; SP—Arcadia; CTY—Crawford; RR— Frisco.
PR—A. H. Schlanger, . . . Pittsburg, Kan.
GM—C. M. Sweeney, " "
PA—C. M. Sweeney, " "
S of H—Mules and 1 steam loco. Track gauge 42 in.
S of M—Steam shovel.
PP—Purchase power

DOPKING & WACHTER COAL COMPANY.
Dopking & Wachter Co. Mine; Bituminous Seam; 32 to 44 in. thick.
PO—Frontenac, Kan; SP—Same; CTY—Crawford; RR—A. T. & S. F.
PR—I. W. Dopking,...Frontenac, Kan.
GS—I. W. Dopking, " "
TR—Peter Wachter, " "
SM—Peter Wachter, " "
EE—Fred Dittman, " "
S of H—Mules
S of M—Hand.
PP—3pumps. Purchase power.
EMP—48. Last fiscal year output, 20,0000 tons.

DOUBLEDAY COAL CO.
General Office, Pittsburg, Kan.
Mine No. 6, Shaft, Cherokee Seam.
PO—Arcadia, Kan. SP—Coalvale, Kan. CTY—Crawford. RR—Frisco.
GM—F. E. Doubleday. Pittsburg, Kan.
PA—F. E. Doubleday, Jr., " "
MS—Charles Spensberger, ..Gross, "
S of H—Mules.
S of M—Hand
PP—2 return tubular boilers, total 150 H.P., 2 pumps.
EMP 108. Last fiscal year output 89.080.80 tons.

ELLIOTT COAL CORP.
See Geo. Elliott Coal Co.

ELLIOTT, GEO., COAL MINING CO.
Robert Elliott Mine; Shaft; Coal Seam; 20 in. thick.
PO—Burlingame, Kan; SP—Same CTY—Osage; RR—A. T. & S. F.
PR—George Elliott....Burlingame, Kan.
GM—George Elliott, " "
PA—George Elliott, " "
MS—George Elliott, " "
EM—George Elliott, " "
S of H—Mules and 1 steam loco. Track gauge 17 in.
S of M—Hand.
PP—1 Water tube boiler, total 35 H. P., 1 gen. unit, 1 pump.
EMP—32. Last fiscal year output, 7,753 tons.
Note—Known previously as the Elliott Coal Corporation.

ELLSWORTH-KLANER COAL COMPANY.
Mines Nos. 10, 101, 111; Stripping; 36 in. thick.
PO—Pittsburg, Kan; SP—Same; CTY—Crawford RR—Frisco, Mo. Pacific & A. T. & S. F.
PR—J. F Klaner, ...Pittsburg, Kan.
GM—J. F. Klaner, " "
TR—H. H. Ellsworth, " "
PA—G. E. Block, " "
MS—T. E. Spicer, " "
MS—A. M. Herbeck, " "
MS—S. P. Darrow, " "
EM—G. E. Block, " "
S of H—5 steam locos. Track gauge 42 in.
PP—3air compressors.
Last fiscal year output, 165,000 tons.

FLEMING COAL COMPANY.
General Office, Kansas City, Mo.
No. 3 Mine, Stripping, Pittsburg Seam 3 ft. 7 in. thick.
PO—Skidmore, Kan. SP—Turck, Kan. CTY—Cherokee. RR—Frisco.
PR—I. M. Fleming, Kansas City, Mo.
TR—I. M. Fleming, " "
GM—I. M. Fleming, " "
SUPT—H. C. Jones, .. Skidmore, Kan.
MS—Howard Blair, " "
SM—Alex. Hermann, "
S of H—Mules. Track gauge 36 in.
S of M—Steam shovel.
PP—2 return tubular boilers, total 150 H.P., 1 generating unit, 250 volts D.C., 2 pumps.
EMP—30.
(Old information.)

FOSTORIA LABOR EXCHANGE COAL CO.
Fostoria, Kas. No report.

GIRARD COAL COMPANY.
Mine No. 1, Shaft, Pittsburgh Seam, 3 ft. 4 in. thick.
PO—Radley, Kan. SP—Same. CTY—Crawford. RR—A. T. & S. F., and Frisco.
PR—J. R. Crowe, .. Kansas City, Mo.
GM—I. M. Fleming, " "
GS—Geo. Mack, ... Pittsburg, Kan.
MS—Wm. Hudson, ... Radley, Kan.
S of H—Mules and 1 elec. loco. Track gauge 36 in.
S of M—Hand
PP—3 Return tubular boilers, total 200 H. P., 1 gen. unit, 250 volts D. C., 1 pump.
EMP—140. Last fiscal year output, 70,000 tons.
(Old information.)

GIRARD FUEL CO.
Pittsburg, Kas. No report.

GRANSTROM, A. W., COAL CO.
PO—Osage City, Kan. SP—Same. CTY Osage. No report.

HAMILTON COAL & MERC. CO., THE
General Office, Weir, Kan.
Mines Nos. 6, 7, and 8, Shafts, "Weir City," or "Cherokee" Seam, 2 ft. 10 in. to 3 ft. 6 in. thick.
PO—Cherokee and Radley Arma, Kan. SP—Same. CTY—Crawford. RR—Frisco., Mo. Pac., A. T. & S. F.
PR—James Hamilton, ... Weir, Kan.
TR—James Hamilton, " "
GM—James Hamilton, " "
MS—Stuart Hamilton, " "
MM—Stuart Hamilton, " "
EM—James Brown, " "
SM—Alex. Hamilton, " "
S of H—Mules, and 1 gasoline loco. Track gauge 36 and 40 in.
S of M—Hand
PP—6 return tubular boilers, total 900 H.P., 3 pumps.
EMP—500. Last fiscal year output 240,000 tons. Sales agent, McAlester Fuel Co.
Stripping Mine.
PO—Scammon, Kan.; SP—Same; CTY—Cherokee; RR—Frisco.
S of M—1 steam shovel.
Daily output 250 tons.

HOME RIVERSIDE COAL CO.
General Office, Leavenworth, Kan.
Receivers—P. T. White and C. N. Fish, Leavenworth, Kan.
GM—C. N. Fish.....Leavenworth, Kan.
GS—C. N. Fish, " "
EM—C. N. Fish, " "
PA—E. F. Reilly, " "

Mine No. 1; Shaft, "Leavenworth" Seam; 22 in. thick.
PO—Leavenworth, Kan.; SP—Same; CTY—Leavenworth; RR—Mo. Pac., C. & G. W., U. P., A. T. & S. F., C. R. I. & P., C. B. & Q.
MS—James Barr.....Leavenworth, Kan.
S of H—Mules. Track gauge 22 in.
S of M—Hand.
PP—3 Kewanee return tubular boilers, total 450 H. P., 2 hoisting engines, 33 gen. units, 2 pumps.
Note—This mine is not working at present.

Mine No. 2; Shaft; "Leavenworth" Seam; 22 in. thick.
PO—Leavenworth, Kan.; SP—Same; CTY ..Leavenworth; RR—Mo. Pac. C. & G. W., U. P., A. T. & S. F., C. R. I. & P., C. B. & Q.
MS—James Graham..Leavenworth, Kan.
S of H—Mules. Track gauge 22 in.
S of M—Hand.
PP—2 Frost return tubular boilers, total 300 H. P., 2 hoisting engines, 3 gen. units, 1 pump.
EMP—350. Last fiscal year output 89,981 tons.

HOTCHKISS, ED., COAL CO.
Out of business.

JACK COAL & MINING CO.
Out of business.

JACKSON-WALKER COAL & MINING CO.
Gen. Office, 1510 Commerce Bldg., Kansas City, Mo.
PR—G. T. Walker,
1510 Commerce Bldg., Kansas City, Mo.
TR—G. T. Walker,
1510 Commerce Bldg., Kansas City, Mo.
GS—Joseph Fletcher,...Frontenac, Kan.
PA—Joseph Fletcher, " "
SCO—Jackson-Walker Merc. Co., Frontenac, Kan.
EM—W. B. Fox, " "
EE—A. J. Fletcher, " "

Nos. 9, 11 and 15 Mines; Shaft and Stripping; Cherokee Seam, 20 to 44 in. thick.
PO—Frontenac, Kan. SP—Same. CTY—Crawford. RR—A. T. & S. F.
S of H—Mules and 5 elec. locos. Track gauge 40 in.
S of M—Hand and 4 steam shovels.
EMP—1200. Last fiscal year output 271,000 tons. Sales Agent, Joseph Fletcher, Frontenac, Kan.

Mine No. 30, Shaft, Seam 14 to 22 in. thick.
PO—Osage City, Kan.; SP—Same; CTY—Osage; RR—A. T. & S. F.
MS—James McDivitt...Osage City, Kas.
S of H—Mules.
S of M—Hand and 3 elec. mach.
PP—Power purchased.
EMP—175. Last fiscal year output 16,150 tons.

JOHNSON, JOHN A. COAL CO.
Osage City, Kas. No report.

JUNIOR COAL & MINING CO.
General Office, Kansas City, Mo.
PR—J. R. Crowe, Jr., Kansas City, Mo.
TR—H. D. Buchanan, " "
GM—Jas. Reed............Wier, Kan.
GS—Jas. Reed, " "
CE—Ed. Woodson, " "
EE—Art Jones, " "
No. 3 Mine; Strip Pit; Upper Seam, 40 to 42 in. thick.
PO—Weir Kan.; SP—Same; CTY—Cherokee; RR—Frisco.
MS—Albert Brady........Weir, Kan.
S of H—1 Steam loco., generator and mules; track gauge, 36 in.
S of M—Hand.
PP—1 Return tubular boiler, 80 H. P., 3 electric pumps.
EMP—35. Last fiscal year output, 48,000 tons.
No. 4 Mine; Strip Pit; Under Seam, 40 to 44 in. thick.
PO—Weir, Kan.; SP—Scammon, Kan.; CTY—Cherokee; RR—Frisco; Main Line.
MS—Daniel Miller.........Weir, Kan.
S of H—1 Steam loco.
S of M—Hand.
PP—1 Boiler, 120 H. P., 3 elec. pumps.
EMP—27. Last fiscal year output 6,000 tons.

KANSAS STATE PENITENTIARY
Shaft Mine; Seam 16 to 20 in. thick.
PO—Lansing, Kan.; SP—Same; CTY—Leavenworth; RR—Mo. P. St. Fe & U. P.
PR—J. K. Codding, (Warden) Lansing, Kan.
GM—J. K. Codding, " "
PA—W. K. Washburn " "
MS—Levi Day " "
CE—D. L. Temple " "
EE—D. L. Temple " "
TR—J. E. Porter, Kansas City, Kan.
S of H—Mules, 1 elec. and 2 steam locos. Track gauge 3 ft.
S of M—Hand.
PP—2 water tube boilers, total 500 H. P., 2 pumps.
EMP—245. Last fiscal year output 90,000 tons.

KATY COAL CO.
Mineral, Kas. No report.

KLONDIKE KOAL CO.
Pittsburg, Kas. No report.

LABOR EXCHANGE COAL ASSOCIATION.
Labor Exchange Coal Mine; Shaft; 16 to 22 in. thick.
PO Scranton, Kan; CTY—Osage; RR—A. T. & S. F.
PR—George Harris,.....Scranton, Kan.
TR—Henry Lucas " "
GM—Thomas Cherry, " "
GS—Thomas Cherry, " "
MS—Thomas Cherry, " "
PA—H. H. Lilley " "
S of H—Mules.
S of M—Hand.
PP—1 pump.
EMP—32. Last fiscal year output, 6,000 tons.

LARSON BROS. COAL CO.
Larson Bros. Mine; Shaft; Seam; 44 to 48 in. thick.
PO—Weir, Kan.; SP—Same; —CTY Cherokee; RR—St. L. & S. F.
MS—L. A. Larson.........Weir, Kan.
SCO—John Larson.
S of H— Mules; Track gauge 29 in.
S of M—Hand.
EMP—20. Last fiscal year output 10,000 tons.

MACKIE, GEO. K., FUEL CO., THE
Mackie C. and Mackie F Mines; Shafts; "Cherokee" Seam; 28 to 54 in. thick.
PO—Scammon, Kan.; SP—Same and Mineral, Kan.; CTY—Cherokee.
PR—Geo. K. Mackie...Scammon, Kan.
TR—Geo. K. Mackie, " "
PA—Geo. K. Mackie. " "
TR Asst—J. W. Mackie, Scammon Kan.
MS—John W. Morton, " "
S of H—Mules; track gauge 40 in.
S of M—Hand.
PP—4 return tubular boilers, total 500 H. P.; 4 pumps.
EMP—185. Last fiscal year output 134,800 tons.

MALLE COAL CO.
Out of business.

MARKHAM, C. H. ,COAL CO.
See Roy-Millner Coal Co.

MAYER COAL CO.
General Office, Kansas City, Mo.
8 Mines in Kansas and 1 in Arkansas.
PR—John Mayer,
324 Sheidley Bldg., Kansas City, Kan.
TR—J. C. Spurgeon,
324 Sheidley Bldg., Kansas City, Kan.
GM—John Mayer,
324 Sheidley Bldg., Kansas City, Kan.
PA—R. I. McGregor,
324 Sheidley Bldg., Kansas City, Kan.
GS—Joseph Humble, West Mineral, Kan.
CE—C. E. Welch, " "
EM—C. E. Welch, " "
EE—Sam Cunningham,
R. F. D. No. 1, Pittsburg, Kan.
Sales Agent, R. I. McGregor, Kansas City, Mo.

Nos. 2, 4, 5, 6, 7, 8, 9, 11 Mines; Shafts; Cherokee or Weir City Seam 28 to 40 in. thick.
PO—West Mineral, Kan.; SP—Radley, Kan., on Santa Fee and West Mineral; Kansas on M. K. & T. CTY—Cherokee.
MS—John Humble,
R. F. D. No. 1, Pittsburg, Kan.
S of H—Mules, 1 gasoline loco.; track gauge 42 in.
S of M—Hand.
PP—10 Return tubular boilers, total 1000 H. P., 6 Pumps.
EMP—1200. Last year output 600,000 tons.

MINERS' FUEL COMPANY.
Red Top Mine; Shaft; Bituminous Seam; 14 to 16 in. thick.
PO—Osage City, Kan; SP—Same; CTY—Osage; RR—Mo. Pacific.
PR—John Gardner, ..Osage City, Kan.
TR—R. J. Cahill. " "
GM—R. J. Cahill, " "
GS—R. J. Cahill, " "
PA—R. J. Cahill. " "
SM—R. J. Cahill, " "
MS—Chas. B. Anderson, " "
S of H—Mules.
S of M—2 elec. machs.
PP—Power purchased.
EMP—25. Last fiscal year output, 7,000 tons.

MOKA COAL CO.
General Office, Pittsburg, Kans.
Stripping Mine; Cherokee Seam, 36 in. thick.
PO—Mulberry, Kan.; SP—Same; CTY—Crawford; RR—Frisco.
PR—W. Williams.......Pittsburg, Kans.
TR—T. W. Coffey, " "
GM—Lee Bigley......Mulberry, Kans.
PA—Lee Bigley, " "
MS—Lee Bigley, " "
S of H—1 Steam shovel; track gauge, 36 in.
PP—4 Pumps.
EMP—60. Last fiscal year output 56,000 tons.

NESCH COAL COMPANY.
Stripping Mine; Upper Vein; 18 to 26 in. thick.
PO—Frontenac, Kan; SP—Same; CTY—Crawford; RR—A. T. & S. F.
PR—H. R. Nesch,.....Pittsburg, Kan.
TR—J. J. Nesch, " "
GM—J. J. Nesch, " "
MS—A. A. Hammel, " "
S of H—1 steam loco. Track gauge 36 inches.
S of M—2 steam shovels.
PP—35 H. P. Motor, 3 phase, 60 cycles. Purchase power.
EMP—60. Last fiscal year output, 500,002 tons.

NEVIUS COAL CO.
See Nevius-Coulter Coal Co.

NEVIUS-COULTER COAL CO.
General Office, Pittsburg, Kan.
Mine No. 6, Shaft; Cherokee Seam, 3½ ft. thick.
PO—Pittsburg, Kan.; SP—Rodley, Kan.; CTY—Crawford; RR—A. T. & S. F.
GM—E. S. Nevius ... Pittsburg, Kan.
PA—E. S. Nevius......Pittsburg, Kan.
TR—F. C. Nichols, " "
PA—E. S. Nevius, " "
MS—V. Glades, " "
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—2 Water tube boilers.
EMP—200.
Sales Agent, Cherokee Fuel Co., Kansas City, Mo.

OSAGE CITY LABOR EXCHANGE.
No. 4 Mine; Shaft; First Seam, 14 to 18 in. thick.
PO—Osage City, Kans.; SP—Same; CTY—Osage; RR—A. T. & S. F.
PR—Wm. Pepeworth, Osage City, Kan.
TR—John Getzinger, " "
GM—John Getzinger, " "
GS—John Getzinger, " "
EE—John Getzinger, " "
MS—Louis N. Parre, " "
S of H—1 Elec. loco.; track gauge 20 in.
S. of M—2 Elec mach.
PP—Boiler 95 H. P., gen. unit, 2,200 volts A. C., 3 phase, 60 cycles; power purchased.
EMP—80. Last fiscal year output 100 tons.
Successors to Labor Exchange Branch No. 223.

OZARK COAL CO.
Frontenac, Kas. No report.

PATTERSON COAL CO.
Pittsburg, Kas. No report.

PATTON COAL & MINING CO.
Mine No. 22, Stripping and Shaft; Seam 14 to 30 in. thick.
PO—Frontenac, Kan.; SP—Same; CTY—Crawford; RR—A. T. & S. F., and Mo. Pac.
PR—J. S. Patton.......Frontenac, Kans.
MS—J. S. Patton, " "
GM—S. I. Patton......Frontenac, Kas.
PA—S. I. Patton, " "
TR—M. B. Patton, " "
EM—Wm. St. John, " "
SCO—Patton's Store, Buyer, S. I. Patton, Frontenac, Kan.
S of H—1 steam loco.; track gauge 56½ in.
S of M—Hand, and steam shovels.
PP—1 boiler, total 100 H. P., 5 pumps, also purchase power.
EMP—50. Last fiscal year output 35,000 tons.
Sales Agent, Jackson & Walker Coal Co. Wichita, Kan.

PIERCE COAL COMPANY.
General Office, Pittsburg, Kas.
Pierce Mine; Stripping; 30 to 36 in. thick.
PO—Pittsburg, Kas.; SP—Willeys Spur, Mo. CTY—Crawford, RR—K. C. S.
PR—Frank Pierce, Sharpsville, Pa.
TR—F. A. Pierce,......Pittsburg, Kas.
GM—F. M. Pierce, " "
PA—F. M. Pierce, " "
MS—Ed. Beauchamp, Mulberry, Kas.
S of H—1 Steam Loco. Track gauge 36 in.
S of M—Hand.
PP—5 Water Tube Boilers.
EMP—50. Last fiscal year output 50,000 tons.

PITTSBURG & MIDWAY COAL MINING CO
No. 8 Mine, Stripping; Cherokee Seam; 38 to 48 in. thick.
PO—R. F. D. No. 6, Pittsburg, Kan.; SP—Midway (Prepay); CTY—Crawford; RR—Frisco.
PR—C. F. Spencer....Pittsburg, Kan.
GM—C. F. Spencer, " "
TR— A. H. Lanyon, " "
GS—C. F. Spencer, " "
PA—C. F. Spencer, " "

MS—Wm. Morgan, R. F. D. No. 6, Pittsburg, Kan.
SM—J. W. Batten. R. F. D. No. 6, Pittsburg, Kan.
SCO—Pittsburg & Midway Coal Mng. Co.
S of H—Mules and 1 steam loco. Track gauge 42 in.
S of M—Steam shovel.
PP—3 engines and 3 pumps.
EMP—55. Last fiscal year output 23,211.95 tons.

PITTSBURG-NORTHERN COAL CO.
General Office, Pittsburg, Kan.
No. 8 Mine, Shaft, Cherokee Seam 3 ft. thick.
PO—Franklin, Kan.; SP—Arma; CTY—Crawford; RR—Mo. Pac.
PR—I. M. Fleming..Kansas City, Mo.
GS—George Mack, .. Pittsburg, Kan.
EM—L. D. Cornelius, " "
MS—Ed. Smith ....Arma, Kan.
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—2 pumps.
EMP—200. Last fiscal year output 103,898.6 tons.
(Old information.)

PITTSBURG-SCAMMON COAL CO.
Pittsburg, Kas. No report.

ROY-MILLNER COAL COMPANY.
PR—A. W. Roy,...........Weir, Kan.
GM—A. W. Roy, " "
PA—A. W. Roy, " "
MS—A. W. Roy, " "
SM—A. W. Roy, " "
TR—W. W. Millner........Weir, Kan.
MM—F. J. Hardman, Mulberry, Kan.

No. 1, 2 & 3 Mines; Stripping; Bituminous Seam, 36 to 42 ins. thick.
PO—Weir, Kan.; SP—Same; CTY—Cherokee; RR—Frisco.
S of H Mules and steam loco.
S of M—Hand.
PP—2 Boilers total 150 H. P.

Stripping Mine; 30 to 36 in. thick.
PO—Mulberry, Kan; SP—Fuller; CTY—Crawford; RR—K. C. S.
S of H—Mules, rope and 1 steam loco.
S of M—2 steam shovels.
PP—5 pumps.
EMP—60.
Formerly operated by C. H. Markham Coal Company.

SHERIDAN COAL CO., THE
General Office, Omaha, Neb.
Nos. 3, 4, 5, 8, 10, 11 and 15 Mines; Shafts.
PO—Mulberry, Kan.; SP—Same; CTY—Crawford; RR—K. C. S., Mo. Pac., Frisco.
PR—G. W. Megeath......Omaha, Neb.
TR—A. P. Whitmore, " "
Secy—W. F. Megeath, " "
PA—E. M. Roberts, " "
MS—E. M. Roberts......Mulberry, Kan.
SM—Walter P. Bailey, " "
S of H—Mules and gasoline loco.
S of M—Hand.
PP—16 Boilers total 2000 H. P.
EMP—1000.

SINCLAIR COAL MINING CO.
Out of business.

SKIDMORE-PATTERSON COAL CO.
Skidmore-Patterson Mine; Stripping; Seam, 30 o 42 in. thick.
PO—Scammon, Kans.; SP—Same; CTY—Cherokee; RR—Frisco, Main Line.
PR—A. H. Skidmore..Columbus, Kans.
TR—S. L. Walker, " "
GM—W. W. Patterson...Pittsburg, Kans.
MS—J. D. Robinson, Scammon Kans.
CE—George Bevard, " "
S of H—2 Steam, 1 gasoline loco and rope; track gauge, 36 in.
S of M—Hand.
PP—4 Boilers, total 84 H. P., 3 pumps.
EMP—24. Last fiscal year output, 24,000 tons.
Successors to the Miller-Kurkee Coal Co.

SPENCER NEWLANDS COAL CO.
PO—Stippville, Kan.; SP—Same; CTY—Cherokee.
No report.

STANDARD COAL CO.
Standard Mine; Shaft; Bituminous Seam; 14 to 18 in. thick.
PO—Scranton, Kas.; SP—Same; CTY—Osage; RR—A. T. & S. F.
PR—James McKinley....Scranton, Kas.
TR—James McKinley, " "
GS—James McKinley, " "
S of H—Mules. Track gauge 20 in.
S of M Hand.
EMP—30. Last fiscal year output 8,000 tons.

STEPHENSON, J. J. & SON, COAL & MINING CO.
Stephenson No. 2 Mine; Stripping; Cherokee Vein, 24 to 36 in. thick.
PO—R. F. D. No. 6, Pittsburg, Kans.; SP—Same; CTY—Crawford; RR—St. L. & S. F., A. T. & S. F., P. & M., 10 Spur branch.
PR—J. J. Stephenson, R. F. D. No. 7, Pittsburg, Kan.
TR—J. J. Stephenson, R. F. D. No. 7 " "
GM—W. H. Stephenson, R. F. D. No. 6, " "
PA—W. H. Stephenson, R. F. D. No. 6, " "
GS—W. H. Stephenson, R. F. D. No. 6, " "
MS—Edgar Carter, R. F. D. No. 6 " "
S of H—1 steam loco.
S of M—1 steam shovel.
EMP—42. Last fiscal year output 50,192.1 tons.

STRUNK COAL CO.
PO—Burlingame, Kan.; SP—Same; CTY—Osage.
No report.

SUPERIOR COAL CO.
Pittsburg, Kas. No report.

WALKER GIBSON COAL CO.
Walker Mine; Shaft; 40 in. thick.
PO—Pittsburg, Kas. SP—Same: CTY—Crawford.
PR—J. A. Gibson,....Pittsburg, Kas.
TR—William Walker, " "
GM—William Walker, " "
MS—A. R. Hornbuckle, " "
S of H—Electric.

WASHINGTON COAL CO.
Burlingame, Kas. No report.

WEAR COAL CO.
General Office, St. Louis, Mo.
PR—Chas. S. Keith..Kansas City, Mo.
TR—E. E. Riley, .. Kansas City, Mo.
CE—J. S. O'Flaherty, " "
EM—J. S. O'Flaherty, " "
GS—J. H. Shaw........St. Louis, Mo.
PA—D. Simpson......St. Louis, Mo.
SCO—Dunkirk Store, Buyer Thos. Mackie, Kansas City, Mo.

Nos. 17, 19 and 21 Mines, Shafts; Pgh. Seam, 2 ft. 10 in. to 3 ft. 2 in. thick; operate washeries.
PO—Pittsburgh, Kan.; SP—Dunkirk, and Cornell, Kan.; CTY—Crawford; RR—A. T. & S. F., and Mo. Pac.
MS—P. Roeser........Pittsburg, Kans.
SM—W. F. Stevenson, " "
S of H—2 Elec. loco. and mules; track gauge 36 in.
S of M—Hand.
PP—8 Return tubular boilers, total 1000 H. P.
EMP—730. Last fiscal year output 351, 122 tons.

No. 20 Mine; Shaft, Pgh. Seam, 2 ft. 10 in. to 3 ft. 2 in.
PO—Pittsburg, Kan.; SP—Same CTY—Crawford; RR—Frisco.
MS—P. Roeser ....Pittsburg, Kan.
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—2 Return tubular boilers, total 200 H. P.
EMP—57. Last fiscal year output 43,774 tons.

WHITMER CONTRACTING COMPANY.
General office, Pittsburg, Kas.
Cherokee & Pittsburg No. 23 Mine; Stripping; Wier Seam; 32 to 48 in. thick.
PO—Pittsburg, Kas. SP—Frontenac, Kas. CTY—Crawford; RR—Santa Fe.
PR—D. H. Whitmer,....Pittsburg, Kas.
TR—D. H. Whitmer, " "
GM—D. H. Whitmer, " "
GS—V. W. Pelton, " "
S of H—One Steam Loco. Gauge of track 36 in.
S of M—Hand.
PP—One Gen. Unit, 220 volts A. C. 3 phase, 60 cycle. Purchase Power, Two pumps.
Last fiscal year output, 33,000 tons.

WEIR JUNCTION COAL CO.
Schwab Mine, "Cherokee" Seam, 24 to 46 in. thick.
PO—Cherokee, Kan.; SP—Weir and Scammon, Kan.; CTY—Crawford; RR—Frisco.
PR—L. S. Schwab....Cherokee, Kan.
GM—L. S. Schwab, " "
PA—L. S. Schwab, " "
MS—L. S. Schwab, " "
CE—Harry Gaude..........Weir, Kan.
SCO—Cherokee Commercial Co., Buyer, H. E. Schwab, Cherokee, Kan.
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—1 boiler, 60 H. P., 2 gen. units, 75 volts D. C.
EMP—50. Last fiscal year output 15,000 tons.
Sales Agent, L. S. Schwab, Cherokee, Kan.

WESTERN COAL & MINING CO.
General Office, St. Louis, Mo.
8 Mines in Kansas, 1 Mine in Illinois. 6 Mines in Missouri, 3 Mines in Arkansas.

Nos. 10, 13, 14, 15, 16, 17, 18 and 19 Mines, Shaft, Seam, 40 in. thick.
PO—Franklin, Kan.; SP—Same, Cornell, Cherokee and Fleming, Kan. CTY—Crawford; RR—Mo. Pac., S. Fe, Frisco.
PR—W. J. Jenkins......St. Louis, Mo.
TR—F. M. Hickman....St. Louis, Mo.
GM—W. J. Jenkins, " "
GS—J. H. Shaw, " "
PA—D. Simpson, " "
EM—C. L. Moorman, " "
MS P. Roeser..........Pitsburg, Kan.
S of H—Mules and elec.
S of M—Hand.

WESTERN FUEL CO.
General Office, Osage City, Kan.
PR—Gust. Johnson....Osage City, Kan.
TR—Arthur V. Johnson, " "
MS—Arthur V. Johnson, " "
GM—Leo. G. Johnson, " "
GS—Leo. G. Johnson, " "
PA—Leo G. Johnson, " "

No. 10 Mine; Shaft; 14 to 24 in. thick.
PO—Osage City, Kan.; SP—Same; CTY—Osage; RR—Mo. Pacific.
S of H—Mules. Track gauge 19 in.
S of M—1 elec. mach.
PP—Power purchased.
EMP—50. Last fiscal year output 8,000 tons.

Coughlin No. 9 Mine; Shaft; 14 to 20 in. thick.
PO Osage City, Kan.; SP Peterton Station; CTY—Osage; RR—A. T. & S. F.
MS—John Coughlin....Osage City, Kan.
S of H—Mules. Track gauge 18 in.
EMP—30. Last fiscal year output 3,000 tons.

WHITED COAL CO.
Pleasanton, Kas. No report.

WILSON BROS. COAL MINING CO.
General Office, Pittsburg, Kan.
No. 14 Capaldo and No. 1 Burnett Capaldo Mines; Shafts; Cherokee Kansas Seam; 14 to 42 in. thick.
PO—RR No. 1, Pittsburg, Kan., via Canaldo; SP—Frontenac, Kan.; CTY—Pittsburg; RR—Santa Fe, Chanute branch.
PR—Henry Wilson—RR. No. 1, Pittsburg, Kan.
TR—R. C. Wilson—RR. No. 1, Pittsburg, Kan.
MG—R. C Wilson—RR. No. 1, Pittsburg, Kan.
PA—R. C. Wilson—RR. No. 1, Pittsburg, Kan.
MS—R. C Wilson—RR. No. 1, Pittsburg, Kan.
S of M—Hand.
S of H—Mules.
PP—Purchase power.
EMP—35. Last fiscal year output, 20,000 tons.
Note—No. 1 Mine leased from J. R. Burnett Coal & Mining Co. and No. 14 Mine from Jackon-Walker Coal & Mining Co

KENTUCKY

For List of Abbreviations See Page 622.

ADVANCE COAL MINING CO.
General Office, Hillside, Ky.
Peerless Mine Shaft; No. 9 Seam; 55 in. thick.
PO—Hillside, Ky.; SP—Same; CTY—Muhlenberg; RR—I. C.
PR—T. F. Lundergan...Memphis, Tenn.
TR—T. F. Lundergan, " "
GM—T. F. Lundergan, " "
GS—T. B. Caldwell, Jr.....Hillside, Ky.
PA—T. B. Caldwell, Jr. " "
MS—William Abercrombe, " "
CE—W. McDonald....Central City, Ky.
EE—William Foster.......Hillside, Ky.
SM—Henry Tudor, " "
S of H—Mules and 1 elec. loco. Track gauge 36 in.
S of M—5 elec. mach.
PP—2 water tube boilers, total 300 H. P., 1 gen. unit, 250 volts D. C., 2 pumps.
EMP—90. Last fiscal year output 75,000 tons.

ALLBURN COAL & COKE CO.
Allburn Mines, Nos. 1, 2 and 3, Drifts, Pittsburgh No. 8 and Thacker Seams, 44 to 74 in. thick.
PO—McCarr, Ky., CTY—Pike. SP—McCarr, W. Va., RR—N. & W
PR—Frank P. Harman, Washington, D. C.
TR—W. A. Young........McCarr, Ky.
PA—W. A. Young, " "
GS—E. McD. Harman " "
MS—Chas. Sigman, " "
MS—W. D. Pettit, " "
MM—J. A. Petts, " "
EM—J. A. Osburn.......Welch, W. Va.
SCO—Allburn Coal & Coke Co., Buyer, J. A. Goble, McCarr, Ky.
S of H—6 Elec. loco., track gauge 44 in.
S of M—5 Elec. mach.
PP—2 Water tube boilers, total 450 H. P., 2 gen. units 500 volts D. C., and 2 pumps, also buy power.
EMP—200. Last fiscal year output 117,505 tons.
Sales Agents, Percy Heilner & Son, Philadelphia, Pa.

ALLEGHENY COKE CO.
General Office, Boston, Mass.
Elkhorn Mine; Drift; Elkhorn Nos. 1 and 2 Seams; 42 to 54 in. thick.
PO—Hellier, Ky., SP—Same, CTY—Pike; RR—C. & O., Marrowbone Br.
PR—A. P. Loring, 40 State St., Boston, Mass.
TR—Caleb Loring........40 State St. Boston, Mass.
GM—T. J. Mitchell....Uniontown, Pa.
GS—J. L. Morgan........Hellier, Ky.
PA—J. L. Morgan, " "
MM—C. Snyder, " "
EE—C. Snyder, " "
EM—Edward Holly......Pikeville, Ky.
CE—Edward Holley, " "
SCO—Allegheny Coke Co. Store Buyer, R.F. McClure, Hellier, Ky.
S of H—2 elec. loco., track gauge 44 in.
S of M—1 comp. air and 5 elec. mach.
PP—2 Erie City water tube boilers, total 600 H. P., 1 gen. unit, 250 volts D. C., 2 pumps and 1 comp.
EMP—150. 150 Mitchell coke ovens. Last fiscal year output 100,000 tons.
Sales Agents, Rogers Brown & Co., Cincinnati, Ohio.

AMERICAN CON. CANNEL COAL CO.
A. C. C. C. Co. Mine.
PO—Loveland, K.; CTY—Morgan.
PR—Thos. G. Macy......Loveland, Ky.
TR—Thos. G. Macy " "
GM—Thos. G. Macy " "
GS—J. R. Rose " "
Successors to American Cannel Coal Co.

AMERICAN FUEL CO. (THE)
General Office, Pikeville, Ky.
Alonzo Mines; Drifts; No. 1 Seam; 36 to 39 in. thick.
PO—Emma, Ky.; SP—Alonzo, Ky.; CTY Floyd; RR—C. & O., Big Sandy Div.
PR—W. W. Reynolds....Pikeville, Ky.
TR—O. P. Chatfield, " "
GM—R. W. Brunk, ...Emma, Ky.
GS—R. W. Brunk, " "
PA—R. W. Brunk, " "
MS—R. W. Brunk, " "
MM—Robert Stewart, " "
EE James Ford..........Auxier, Ky.
SCO—The American Fuel Co. Store, Buyer, F. B. Preston, Emma, Ky.
S of H—Mules and comp. air. Track gauge 42 in.
S of M—6 comp. air machines.
PP—1 return tubular boiler, 150 H. P., 1 compressor and 1 pump.
EMP—35. Last fiscal year output 35,000 tons.
Sales Agent, O. P. Chatfield, Pikeville, Ky.

ARCHBOLD, JOHN, COAL CO.,
General Office, Evansville, Indiana.
1 Mine in Kentucky and 1 in Indiana.
Bluff City Mine; Shaft; No. 9 Seam, 4 ft. 2 in. to 4 ft. 5 in. thick.
PO—Bluff City, Ky., SP—Same, CTY—Henderson.

(Continued on Next Page.)

Archbold, John Coal Co.—Cont.
PR—John Archbold...Evansville, Ind.
TR—V. D. Herrenbruck, " "
GM—John Archbold, " "
PA—John Archbold, " "
CE—John Archbold, " "
GS—Edmund Archbold....Newburgh, Ind.
MM—Edmund Archbold, " "
S of H—Mules; track gauge 36 in.
S of M—Pick.
Mine not operating.

ASHER COAL MINING CO.
Wasioto, Ky. No report.

ASHLAND IRON & MINING CO.
Rush No. 12 Mine, Drift, No. 7 Seam 4 ft. thick.
PO—Rush, Ky.; SP—Same; CTY—Boyd; RR—A. C. & I.
PR—W. B. Seaton......Ash'and, Ky.
GM—W. B. Seaton, " "
GS—W. B. Seaton, " "
TR—F. B. Moore, " "
PA—E. C. Jones, " "
SM—E. C. Jones, " "
MM—J. L. Mehan, " "
MS—Sam Seaton..........Rush, Ky.
S of H—Mules. Track gauge 43½ in.
S of M—Hand and 2 puncher mach.
EMP—32. Last fiscal year output 4,355 tons.

ASHLESS COAL COMPANY
General Office, Lothair, Ky.
Ashless Coal Corp. Mine; Drift; No. 4 Seam; 48 to 54 in. thick.
PO—Lothair, Ky.; SP—Same; CTY—Perry; RR.—L. & N., L. & E. Br.
PR -L. N. Buford.......Roanoke, Va.
TR—Hugh Buford.........Lothair, Ky.
GM—Hugh Buford " "
GS—D. T. Mitchell " "
MS—Kelly Peck " "
EE—A. Upton " "
SM—G. C. Adams " "
S of H—5 elec. storage battery locos Track gauge 48 in.
S of M—4 elec. mach.
PP—Turbine Engine, 2 return tubular boilers, total 300 H. P.
EMP—125. Last fiscal year output, 72,850 tons.
Sales Agency, Castner, Curran & Bullitt, Cincinnati, O.

ATLAS COAL MINING COMPANY.
General office, Knoxville, Tenn.
Atlas Mine; Drift; Lower Hignite Seam; 42 to 48 in. thick.
PO—Ralston, Ky; SP—Capito, Ky;; CTY Bell; RR—L & N, Stony Fork branch.
PR—L C. Gunter, Knoxville, Tenn.
TR—S. W. Jayne, Knoxville, Tenn.
GM—R. E Howe, Shamrock, Ky.
GS—R. E. Howe, Shomrock, Ky.
PA—R. E Howe, Shamrock, Ky
MS—W. S. Williams, Ralston, Ky.
EM—J. C. Richardson, Middlesboro, Ky.
SM—C. A. Douglas, Ralston, Ky.
S of H—Mules Track gauge 44 in.
S of M—8 Comp. air mach.
PP—2 Return tubular boilers; total 200 H. P., 1 air compressor, 1 pump.
EMP—100. Last fiscal year output, 60,000 tons.
Note—Successors to Ralston Coal Co.

AUXIER COAL & MINING CO.
Drift Mine; Kentucky No. 1 Seam; 30 to 54 in. thcik.
PO—Auxier, Ky.; SP—Same; CTY—Floyd; RR—C. & O., Big Sandy Div.
PR—J. C. B. Auxier......Auxier, Ky.
GM—J. C. B. Auxier " "
TR—S. R. Auxier " "
PA—S. R. Auxier. " "
MS—J. C. Smith " "
EM—J. T. Ford, " "
CE—Edw. Holly.........Pikeville, Ky.
SCO—J. C. B. Auxier Store, Auxier, Ky.
S of H—Mules. Track gauge 42 in.
S of M—Hand.
PP—1 water tube boiler, 35 H. P., 3 pumps.
EMP—20. Last fiscal year output 4,500 tons.
Sales Agencies, Middle West Coal Co. and Puritan Coal Co.
Successor to Mary Luck Coal Co.

BANK COAL CO
See Houston & Pfoff.

BANNER FORK COAL CO.
Banner Fork No. 1 Mine; Drift; Wallins Creek Seam; 72 to 90 in. thick.
PO—Wallins Creek, Ky.; SP—Wallins, Ky.; CTY—Harlan; RR—L. & N.
PR—W. J. Cunningham, Wallins Creek, Ky.
TR—L. P. Johnson " "
GS—L. P. Johnson, " "
PA—L. P. Johnson " "
EM—Henry Groos,.........Harlan, Ky.
New company will ship coal July 1.

BEATTYVILLE COMPANY
General Office, Beattyville, Ky.
Beattyville Co. Mine; Drift; Drift-Knnic Seam; 30 to 52 in. thick.
PO—Beattyville, Ky.; SP—Same; CTY—Lee; RR—L. & N.
PR—Patrick Calhoun, Jr., Cleveland, O.
VP—J. K. Roberts.....Beattyville, Ky.
TR—J. K. Roberts.....Beattyville, Ky.
GM—J. K. Roberts. " "
GS—J. K. Roberts, " "
PA—J. K. Roberts, " "
MS—J. M. Cole, " "
S of M—Hand.
EMP—10.

BEAVER DAM COAL CO.
PR—W. S. Speed.......Louisville, Ky.
TR—C. D. Major, " "
GM—M. M. Bardwell, " "
PA—M. M. Bardwell, " "
GS—I. P. Barnard, " "
EM—R. H. Shelley.......McHenry, Ky.
MM—M. A. Hudson, " "
CE—R. H. Shelly, " "
EE—N. Barrass, " "

Taylor Mine, Drift, No. 9 Seam, 4 ft. 2 in. to 6 ft. thick.
PO—Beaver Dam, Ky.; SP—Same; CTY—Ohio RR—Illinois Central.
MS—Geo. Smith, " "
SCO—Taylor Coal Co. of Kentucky, buyer, Guy Stateler, McHenry, Ky.
SM—Wm. Vaughn, .. Beaver Dam. Ky.
S of H—Mules and elec. loco. Track gauge 39 in.
S of M—25 comp. air mach.
PP—3 water tube boilers, total H. P. 850., 2 gen. units, 250 volts D. C., 2 air compressors, 9 pumps.
EMP—240. Last fiscal year output 140,000 tons. Sales agency, B. F Reed, Louisville, Ky.
Formerly operated by Taylor Coal Co.

Williams Mine; Shaft; No. 9 Seam; 48 to 54 in. thick.
PO—McHenry, Ky.; SP—Same; CTY—Ohio; RR—Ill. Central.
MS—James Abercrombie...McHenry, Ky.
SCO—Williams Store Co.
S of H—4 elec. loco. Track gauge 39 in.
S of M—2 elec. and 19 comp. air mach
PP—4 B. & W. water tube boilers, total 600 H. P., 3 gen. units, 1—2300 volts A. C., and 2—250 volts A C., 3 phase, 60 cycle, 9 pumps, 3 air comp.
EMP—240. Last fiscal year output 138,393 tons.
Note—Successors to Williams Coal Co.

BEECH CREEK COAL CO.
Beech Creek Nos. 1 and 2, Shaft and Drift, No. 9 Seam, 5½ to 6½ ft. thick.
PO—Beech Creek, Ky., SP—Same. CTY—Muhlenberg; RR—L. & N., O. & N. Div.
PR—Dr. B. G. Henning, Beech Creek, Ky
TR—A. D. Kirkpatrick, " "
GM—A. D. Kirkpatrick, " "
PA—A. D. Kirkpatrick. " "
GS—R. R. Kirkpatrick, Beech Creek, Ky.
EE—W. H. Hines. " "
MS—W. H. Chumbley, " "
SCO—Beech Creek Coal Co. " "
Buyer, A. D. Kirkpatrick, " "
S of H—Mules, rope and 1 elec. loco.; track gauge 36 inches.
S of M—9 elec. machines.
PP—3 Return tubular boilers, total 450 H. P., 2 gen. units 250 volts D. C., 1 pump.
EMP—240. Last fiscal year output 141,000 tons.

BELL UNION COAL & MINING COMPANY.
Curlew Mine. Slope; No. 9 Seam; 4 ft. 8 in. to 5 ft. thick.
PO—Curlew, Ky.; SP—Dekoven, Ky.; CTY—Union; RR—I. C.
PR—Wm. Conway, 1619 Arch St., Phila., Pa.
TR—J. J. Coyle, 1619 Arch St., Phila., Pa.
GM—J. D. Scott...........Curlew, Ky.
PA—J. D. Scott. " "
EM—J. D. Scott, " "
MM—Wm. Marvel, " "
SM—J. D. Scott, " "
S of H—Rope; track gauge 36 in.
S of M—3 elec. mach.
PP—2 Atlas return tubular boilers, total 300 H. P., 1 gen. unit, 250 volts D. C., 1 pump.
EMP—90.

BEVIER COAL CO.
Bevier Mine; Shaft; West Kentucky No. 9 Seam; 66 to 76 in. thick.
PO—Cleaton, Ky.; SP—Same; CTY—Mulhenberg; RR—L. & N., O. & N.
PR—J. W. Bastin........Nelson, Ky.
TR—J. P. Cox............Cleaton, Ky.
GM—J. P. Cox..........Cleaton, Ky.
PA—J. P. Cox. " "
GS—J. P. Cox...........Cleaton, Ky.
MS—Claude Tate, " "
MM—E. A. Hall. " "
EE—E A. Hall. " "
SCO—Bevier Coal Co Store. Buyer, J. P. Cox, Cleaton, Ky.
S of H—2 Elec. loco. and mules; track gauge 36 in.
S of M—14 comp. air mach.
PP—5 Atlas water tube boilers, total 700 H. P., 1 gen. unit 125 K. W. 250 volts D. C., 1 comp. and 2 pumps.
EMP—175. Last fiscal year output 104,348.67 tons.

BIG BRANCH COAL CO.
Big Branch Mine. Drift, Up. Elkhorn Seam, 42 to 60 in. thick.
PO—Lookout, Ky. SP—Big Branch, Ky. (Prepay); CTY—Pike; RR—C. & O., Big Sandy branch.
PR—H. C. Beury....Philadelphia, Pa.
TR—J. W. Cockill, ... Lookout, Ky.
GM—J. W. Cockill, " "
PA—J. W. Cockill, " "
MS—J. F. Davis. " "
MM—Lawrence Gambill, " "
EE—Jerry Francisco, " "
EM—Ed. Holly...........Pikeville, Ky.
SM—H. C. Cockill. " "
S of H—2 elec. locos. Track gauge 44 in.
S of M—3 elec. mach.
PP—2 B. & W. water tube boilers, total 400 H. P., gen. unit 2,400 volts A. C., 3 phase, 60 cycles; power from Central plant at Henry Clay Mine.
EMP—42. Last fiscal year output, 40,984 tons. Sales Agency, Eaton, Rhodes & Co., Cincinnati, O.

BIG RUN COAL CO.
General Office, Winchester, Ky.
Big Run Mine; Drift; No. 7 Coalton Seam; 36 to 66 in. thick.
PO—Princess, Ky. SP—Same. CTY—Boyd. RR—C.&O., and A.C.&I.
PR—D.S. Gay, ... Winchester, Ky.
TR—H. A. Paynter, " "
PA—H. A. Paynter, " "
PA—John F. Hubbard....Princess, Ky.
GS—John F. Hubbard, " "
MS—John F. Hubbard, " "
SM—John F. Hubbard, " "
EE—Frank Clay, " "
S of H—3 elec. locos. Track gauge 42 in.
S of M—3 elec. mach.
PP—1 water tube boiler 180 H.P., 1 generating unit, 250 volts D. C., 1 pump.
EMP 75.

BIG SANDY CONSOLIDATED FUEL CO. INC.
W. S. Wells, receiver.
Beaver Pond Mine; Drift; No. 1 Seam. 30 to 42 in. thick.
PO—Prestonsburg, Ky.; SP—Same and Auxier, Ky.; CTY—Floyd; RR—C. and O., B. and S. Div.
PR—W. S. Wells......Prestonburg, Ky.
TR—W. S. Wells. " "
GM—W. S. Wells, " "
GS—W. S. Wells. " "
S of H—1 elec. loco. and mules. Track gauge 42 in.
S of M—5 Elec. mach. and hand.
PP—2 return tubular boilers, total 250 H. P., 1 gen. unit, 250 volts D. C.
Sales Agency, West-Crescent Fuel Co., Toledo, O., Pintau Coal Co., Chicago, Ill.
Idle for several months.

BLACK DIAMOND MINING CO.
Pierce Mine, Shaft, No. 9 Seam, 5 ft. 4 in. to 5 ft. 10 in. thick.
PO—Drakesboro, Ky. SP—Same. CTY—Muhlenberg. RR—L.&N.
PR—W. W. Bridges, . Drakesboro, Ky.
GM—W. W. Bridges, " "
TR—F.E. Jones. " "
GS—J. T. Bridges.....Drakesboro, Ky.
PA—T. A. Isaac, " "
MS—W. B. Franklin, " "
EE—J. L. Wilkins, "
SCO—Black Diamond Merc. Co. Buyer, T. A. Isaac, Drakesboro, Ky.
S of H—2 elec. loco. and mules. Track gauge 36 in.
S of M—7 elec. mach.
PP—3 return tubular boilers, 2 gen units, 250 volts D.C., 1 pump.
EMP—200. Last fiscal year output 125,000 tons. Sales Agent, J. Pierce Jones, Secy.

BLUE DIAMOND COAL CO.
General Office, Knoxville, Tenn.
Blue Diamond Mine; Drift; Hazard or No. 6 Seam; 60 to 80 in. thick.
PO—Typo, Ky.; SP—Cardiff, Ky.; CTY—Perry; RR—L. & N.
PR—Alex Bonnyman....Knoxville, Tenn.
TR—J. B. Campbell ......Atlanta, Ga.
GM—Joseph Richards........Typo, Ky.
VP—Calvin Holmes.....Cincinnati, O.
PA—Chas Cochran......Westbourne, Ky.
EM—Jos. Richards " "
Resident Eng.—R. T. Scott....Typo, Ky.
SM—J. D. Kri s, " "
MS—H. H. Braden ....Typo, Ky.
S of H—Mules and 2 elec. locos. Track gauge 48 in.
S of M—2 elec. mach.
PP—Purchased A. C. power for 150 K. W. motor generator sets.
EMP—100.

BLUE GRASS COAL CO.
General Office, Johnson City, Tenn.
Hazard Mine; Drift; No. 4 Seam, 42 to 66 in. thick.
PO—Hazard, Ky.; SP—Same; CTY—Perry; RR—L. & E.
PR—S. R. Jennings, Johnson City, Tenn.
TR—C. H. Anderson, " " "
GM—H. K. English........Hazard, Ky.
PA—H. K. English........Hazard, Ky.
SM—J. H. McKinney, " "
MS—J. L. Bishop, " "
MM—O. K. Holt.........Hazzard, Ky.
EE—O. K. Holt " "
S of H—3 elec. locos.
S of M—5 elec. mach.
PP—2 Return tubular boilers, total 300 H. P., gen. unit, 250 volts D. C., 2 pumps.
EMP—125. Last fiscal year output 100,000 tons.
Successors to the Hazard-Dean Coal Co.

BON JELLICO COAL CO.
General Office, Knoxville Tenn.
Bon Jellico Mine, Drift, Jellico Seam, 34 to 42 in. thick.
PO—Williamsburg, Ky., SP—Bon, Ky. CTY—Whitley. RR—L.&N.
PR—Arthur Groves, .. Knoxville, Tenn
TR—W. J. Everett, " "
GM—E. B. Taylor.........Mt. Ash, Ky.
GS—J. E. Taylor, " "
PA—E. B. Taylor " "
MM—Frank Smith......Bon Jellico, Ky.
EE—Frank Smith. " "
MS—John E. Taylor....Bon Jellico, Ky.
EM—L. J. Madden,.......Mt. Ash, Ky.
S of H—2 Elec. loco., and mules; track gauge 44 in
S of M—5 Elec. mach.
PP—Boiler, 150 H. P., 1 gen. unit, 250 volts D.C.
EMP—200. Last fiscal year output 90,000 tons. Sales agent, Frank Floyd, Knoxville, Tenn.

BORDERLAND COAL CO.
General Office, Borderland, W. Va.
PR—Edw. L. Stone, .. Roanoke, Va.
TR—E. B. Fishburn, " "
GM—L. E. Armentrout, Borderland, W. Va.
PA—L.E. Armentrout, " "
GS—V. A. Miller " "
EM—J. P. Shockey, " "
SM—R. L. Sampson " "
Sales agency, Borderland Coal Sales Co., Cincinnati, O.

Borderland No. 1 Mine, Drift, Winifrede Seam, 48 to 96 in. thick. Operate Washery.
PO—Borderland, W. Va. SP—Same. CTY—Mingo. RR—N.&W.
MS—V. A. Miller....Borderland, W.Va.
S of H—1 Steam and 8 Elec. loco.; track gauge 48 in.
S of M—6 Elec. mach.
PP—2 Return tubular Atlas boilers, total 300 H. P., 2 gen. units 250 volts D. C., 3 pumps.
EMP—200. Last fiscal year output 208,054 tons.

Borderland No. 2 Mine, Drift, Winifrede Seam, 4 to 7 ft. thick. Washery.
PO—Borderland, W. Va. SP—Armen, W. Va. CTY—Mingo. RR—N &W.
MS—J. G. Hinkle...Borderland, W. Va.
S of H—7 elec. loco. Track gauge 48 in.
S of M—6 elec. mach.
PP—3 Return tubular Atlas boilers, total 450 H. P., 2 gen. units, 250 volts D. C., 3 pumps.
EMP—150. Last fiscal year output 112,263 tons.

BROADWAY COAL MINING CO.
General Office, 1214-19 Exchange Bldg. Memphis, Tenn.
Broadway Mine, Shaft, No. 9 Seam, 54 to 66 in. thick.
PO—Simmons, Ky. SP—Same. CTY—Ohio. RR—Louisville Div., Ill. Central.
PR—W.W. Simmons, Memphis, Tenn.
TR—W.W. Simmons, " "
MGR—Geo. M. Burton, . Simmons, Ky.
MS—Charles Hendrie, " "
EM—Charles Hendrie, " "
SCO—Broadway Coal Mining Co. Store, Buyer, Geo. M. Burton, Simmons, Ky.
S of H—1 elec. loco. Track gauge 36 in.
S of M—20 Comp. air mach.
PP—2 Atlas and 1 Dan Shea return tubular boilers, total 450 H.P., 250 volts D.C., 1 air comp. and 6 pumps.
EMP—250. Last fiscal year output 149,000 tons. Sales Agency, Broadway Coal & Ice Co., Memphis, Tenn.

BRUSH CREEK MINING & MFG. CO.
Blue Star Mine, Drift, Dean Seam, 4½ to 5 ft. thick.
PO—Wheeler, Ky.; SP—Artemus; CTY—Knox. RR—Cumberland RR
PR—H. H. Owens......Borbonville, Ky.
TR—W. B. Siler. .... Jellico Tenn.
GM—J. W. Bradley..........Brad l, Ky.
GS—J. W. Bradley, " "
PA—J. W. Bradley, " "
CE—F. R. Sargent,.......Artemus, Ky.
EM—F. R. Sargent, " "
SM—R. C. Partun, " "

S of H—Milwaukee Gasoline loco. and mules; track gauge 36 in.
S of M—14 Comp. air mach.
PP—1 Walsh & Welder return tubular boiler, 150 H.P., 1 air comp. and 3 pumps.
EMP—50. Last fiscal year output 48,250 tons. Sales agency, Procter Coal Co., Knoxville, Tenn.

BRY-MAC COAL COMPANY

General Office, Strunk, Ky.
West Jellico Mine; Drift; No. 4 Seam; 30 to 36 in. thick. Operate washery at Roberta, Tenn.
PO—Strunk, Ky.; SP—Silerville, Ky.; CTY—McCreary; RR—C. N. O. & T. P.
PR—L. E. Bryant,......Roberta, Tenn.
TR—L. E. Bryant, " "
GM—L. E. Bryant, " "
GS—L. E. Bryant, " "
PA—H. W. Keen.........Strunk, Ky.
SM—H. W. Keen, " "
MS—General Strunk, " "
SCO—Bry-Mac Coal Co.
S of H—Mules and 1 steam Vulcan loco. Track gauge 36 in.
S of M—Hand.
EMP—100. Last fiscal year output, 24000 tons.
Successors to West Jellico Coal Co.

BURK HOLLOW COAL CO.

Burk Hollow Mine. Drift. Blue Gem Seam, 22 to 26 in. thick.
PO—Jellico, Tenn.; SP—Same; CTY—Campbell; RR—L. & N.
PR—Dr. S. B. Snyder....Jellico, Tenn.
TR—J. B. Snyder.....Williamsburg, Ky.
PA—W. H. Hobbs, ...Jellico, Tenn.
SM—W. H. Hobbs, " "
GM—G. W. Smith, " "
MS—G. W. Smith, " "
EM—B. L. Lloyd, " "
S of H—Mules and 1 gasoline loco. track gauge 36 in.
S of M—Hand.
PP—5 pumps.
EMP—60. Last fiscal year output 12,000 tons.
Sales agency, Burk Hollow Coal Co., Jellico, Tenn.

BURNS BLUE GEM COAL CO.

Drift Mine; Blue Gen Seam, 24 to 32 in. thick.
PO—Gatliff, Ky.; SP—Same; CTY—Whitley; RR—L. & N., Pine Mountain Br.
PR—Garfield Howard......Gatliff, Ky.
TR—James Sheeley " "
PA—James Sheeley, " "
GM—John Burns, " "
EM—W. M. Archer, " "
SCO—Gatliff Coal Co., " "
S of H—Mules.

BURNWELL COAL & COKE CO.

General Office, Pottsville, Pa.
Mine in Kentucky Tipple in W. Va.
Burnwell Mine; Drift; Brownstown Seam; 63 to 87 in. thick.
PO—Sprigg, W. Va.; SP—Same; CTY——Mingo, RR—N. & W.
PR—N. W. Beddall......Pottsville, Pa.
TR—Geo. W. Barlow..Mahanoy City, Pa.
Sec.—E. A. Beddall.....Pottsville, Pa.
GM—J. E. Barlow......Sprigg, W. Va.
PA—J. E. Barlow, " "
MS—Thomas H. Beddall, " "
EM—Thomas H. Beddall, " "
MM—Horace Beddall.
EE—Horace Beddall, " "
SCO—Burnwell Co. Buyer, J. E. Barlow, Spriggs, W. Va.
S of H—Mules and 4 elec. loco. Track gauge 48 in.
S of M—5 elec. machines.
PP—3 Erie return tubular boilers, total 350 H. P., 2 gen. units 250 volts D. C.
EMP—134. Last fiscal year output 60,000 tons.
Sales Agent, E. A. Beddall, Pottsville, Pa.

CARBONDALE COAL & COKE CO.

Carbondale Mine, Drift; No. 9 Seam, 4 ft. 2 in. to 4 ft. 8 in. thick.
PO—Dawson Springs, Ky.; SP—St. Charles, Ky., CTY—Hopkins; RR—Ill. Cent., Louisville Div.
PR—C. S. Bookwalter....Paducah, Ky.
GM—W. G. Wright..Dewson Springs, Ky.
TR—W. G. Wright..Dawson Springs, Ky.
PA—W. G. Wright, " "
MS—Robert Hart, " "
EM—Robert Hart, " "
SM—Charles Nisbet, " "
MM—Nick Smothers, " "
S of H—Mules and rope, track gauge 3 ft.
S of M—10 Comp. air machines.
PP—4 Walton water tube boilers total 450 H. P.: 1 air comp.; 2 pumps.
EMP—125. Last fiscal year output 88,199 tons.
Sales Agent, C. M. Ricker, Paducah, Ky.

CAMP MINING CO.

General Office, Elys, Ky.
No. 1 Mine; Slope and Drift; Jellico Seam; 52 to 85 in. thick.
PO—Elys, Ky.; SP—Same; CTY—Knox; RR—L. & N.
PR—H. N. Camp, Jr... ....Elys, Ky.
TR—H. N. Camp, Jr. " "
GM—H. N. Camp, Jr. " "
PA—H. N. Camp, Jr. " "
MS—P. Fannon, " "
MM—Ben Suttles, " "
S of H—Mules and rope.
S of M—Hand.
PP—2 Atlas return tubular boilers, total 150 H. P., 1 gen. unit., 250 volts D. C.
EMP—150. Last fiscal year output 50,000 tons.
Sales Agent, H. N. Camp, Jr.
Successor to Smokeless Coal Corp.

CARTER COAL CO.

General Office, Coalwood, W. Va.
6 Mines in West Va., 4 Mines in Ky.
PR—Geo. L. Carter....Coalwood, W.Va.
TR—C. A. Hall, " "
GS—F. A. Garth, " "
PA—M. M. King, " "
EM—R. L. Keel, "
EE—D. H. Bell, " "
Sales Agencies, Carter Coal Co., Coalwood, W. Va.; and Wm. C. Atwater, New York, N. Y.

Warren No. 4, Drift, Dean Seam, 4 to 6 ft. thick; operate washery.
PO—Warren, Ky., SP— Same, CTY—Knox; RR—Cumberland R. R.
MS—C. E. Bullard........Warren, Ky.
SM—M. T. Lindsey, " "
S of H—12 Elec. loco., track gauge 48 in.
S of M—15 Elec. mach.
PP—5 Atlas water tube boilers, total 625 H. P., 3 gen. units 250 volts D. C., 2 pumps.
EMP—300 Last fiscal year output 200,000 tons.

Trosper No. 1, Dean Seam, 4 to 6 ft. thick; operate washery.
PO—Trosper, Ky., SP—Same, CTY—Knox; RR—Cumberland R. R.
MS—Roy Rainey..........Trosper, Ky.
SM—D. P. Martin, ... Trosper, Ky.
S of H—Mules and 1 elec. loco., track gauge 42 in.
S of M—5 Elec machines.
PP—Power furnished from Warren Mine, 2 pumps.
EMP—110. Last fiscal year output 43,000 tons.

Anchor Mine, Dean Seam, 4 ft. thick.
PO—Anchor, Ky., SP—Same, via Artemus, Ky., CTY—Knox. RR—L.& N. Cumberland R. R.
MS—J. B. Rogers........Anchor, Ky.
SM—R. F. Pierce, " "
S of H—3 Elec. loco.; tarck gauge 42 in.
S of M—Elec. machines.
PP—2 Return tubular boilers, 250 H. P., total, 1 gen. unit 250 volts D. C., 1 pump.

Trosper Mine, Drift, Dean Seam, 4 ft. thick; operate washery.
PO—Trosper, Ky., SP—Same, via Artemus. RR—L. & N., Cumberland R. R.
MS—Roy Raney..........Trosper, Ky.
SM—Daniel Martin, " "
S of H—2 Elec. loco.; track gauge 42 in.
S of M—Elec. machines.
PP—Power furnished from Warren Mine.

CENTER, WM.

Klondike Mine; Drift; Pgh. Seam, 36 in. thick.
PO—Viva, Ky.; SP—East Bernstadt, Ky.; CTY—Laurel; RR—L. & N.
GM—Wm. Center...........Viva, Ky.
MS—Wm. Center, " "
S of H—Mules.
S of M—Hand.

CENTRAL COAL & IRON CO.

Central Mine; Shaft; Western Kentucky No. 9 Seam; 54 to 60 in. thick.
PO—Central City, Ky.; SP—Same; CTY—Muhlenberg; RR— Illinois Central and L. & N.
PR—S. J. Gish......Central City, Ky.
GM—S. J. Gish, " "
GS—Dave Salsburg, " "
PA—S. P. Taylor, " "
EM—B. E. Hess, " "
EE—P. H. McDowell, " "
MS—D. A. Woodburn, " "
TR—L. L. Dunham, New York City, N.Y.
SCO—Central Coal & Iron Co., Buyer, S. J. Gish, Central City, Ky.
S of H—3 Elec. loco.; track gauge, 36 in.
S of M—9 elec. mach.
PP—5 Return tubular boilers, total 650 H. P., 2 gen. units, 250 volts D. C., 2 pumps.
EMP—287. Last fiscal year output, 208,500 tons.
Sales Agent, J. H. Small, Central City, Ky.

CHARLTON JELLICO COAL CO.

General Office Charlton, Ky.
Charlton Jellico Coal Co. Mine.
PO—Gray, Ky.; CTY—Knox.
PR—Wm. J. Black.........Gray, Ky.
TR—Wm. J. Black, " "
PA—Wm. J. Black, " "
GS—Wm. J. Black, " "
GM—L. R. Reese, " "
MS—L. R. Reese, " "
S of H—Mules and elec. locos.
S of M—Hand and elec. mach.
PP—1 boiler, total 225 H. P., pumps.
EMP—150.

CHENOA-HIGNITE COAL CO.

General Office, Pineville, Ky.
Chenoa-Hignite Mine; Drift; Hignite Seam; 42 to 58 in. thick.
PO—Chenoa, Ky.; SP—Same; CTY—Bell; RR—L. & N., Chenoa branch.
PR—D. C. Swab......Hartranft, Tenn.
TR—M. S. Hollingsworth, Middlesboro, Ky
GM—William Costello " "
PA—W. H. Hollingsworth...Chenoa, Ky.
EM—W. H. Hollingsworh " "
MS—W. H. Hollingsworth " "
CE—J. R. Justice....Williamsburg, Ky.
MM—G. G. Hatfield.......Chenoa, Ky.
EE—G. G. Hatfield, " "
SCO—Chenoa-Hignite Coal Co. Store. Buyer, Thomas Walden, Chenoa, Ky.
S of H—2 elec. locos. Track gauge 44 in.
S of M—3 Elec. machines.
PP—1 Walsh and Weidner return tubular boiler, total 150 H. P. 1 gen. unit, 300 volts D. C., 2 pumps. Power purchased. ...
EMP—80. Last fiscal year output 60,000 tons.

CLAY, HENRY, COAL & COKE CO.

Henry Clay; Drift; Upper Elkhorn Seam 42 to 60 in. thick.
PO—Lookout, Ky.; SP—Henry Clay, Ky.; (Prepay); CTY—Pike; RR—C. & O., Big Sandy branch.
PR—W. J. Beury,3432 N. 17th St., Philadelphia, Pa.
TR—J. W. Cockill......Lookout, Ky.
GM—J. W. Cockill, " "
PA—J. W. Cockill, " "
MM—Lawrence Gambill, " "
EE—Jerry Francisco, " "
SM—W. B. Cockill, " "
MS—Wall Wiley, " "
MS—G. B. Rackley, " "
EM—Ed. Holly..........Pikeville, Ky.
S of H—2 elec. locos. and mules; track gauge 44 in.
S of M—3 Elec. mach.
PP—2 B. & W. water tube boilers, total 400 H. P., gen. units 2400 volts A. C., 3 phases and 60 cycles, and 250 volts D. C.; also furnish power to Big Branch Coal Co.
EMP—50. Last fiscal year output 43,940 tons. Sales Agency, Eaton, Rhodes & Co., Cincinnati, O.

CLEAR FORK COAL & COKE CO.

General Office, Middlesboro, Ky.
Clear Fork, Mine, Drift, Mingo Seam, 3½ to 6 ft. thick.
PO—Fonde, Ky., SP—Same, CTY—Bell. RR—L. & N. & Sou Ry., Clear Fork Branch.
PR—J. D. Templin....Middlesboro, Ky.
TR—T. Milan, " "
GM—G. P. Morrison........Fonde, Ky.
PA—G. P. Morrison, " "
MS—Peter Rerr, " "
MM—C. Partin, " "
EE—Jas. Brockett, " "
EM—R. E. Richardson..Middlesboro,Ky.
SCO—Clear Fork Coal & Coke Co. Store, Buyer, W. W. Johnson, Fonde, Ky.
S of H—17 Elec. loco., track gauge 44 in.
S of M—Hand and 7 elec. mach.
PP—6 Walsh & Wediner water tube boilers, total 900 H. P., 3 gen. units 250 volts D. C., 6 pumps.
EMP—250. Last fiscal year output 275,000 tons.

CLEARFIELD LUMBER CO.

Road Fork No. 3 Mine. Worked out Sept., 1915.

CLERE, F. H. (Lessee)

Clere Mine, Drift, No. 7 Seam, 2 to 4 ft. thick.
PO—Coalton. Ky., SP—Same, CTY—Boyd; RR—A. C. & I.
GM—F. H. Clere, " "
S of H—Mules.
S of M—Hand.
EMP—25. Last fiscal year output 11,877 tons.

CLIFF COAL CO, (THE)

General Office, Portsmouth, O.
Cliff Mine, Slope.
PO—Cliff, Ky.; SP—Same; CTY—Floyd; RR—C. & O.
PR—B. F. Vincent........Cliff. Ky.
PA—B. F. Vincent..........Cliff, Ky.
GM—B. F. Vincent, " "
GS—W. Blackburn, " "
EM—Edward Holly......Pikesville, Ky.
SCO—The Cliff Coal Co.; Buyer, G. B. Hughes, Cliff, Ky.
S of H—elec. loco. Track gauge 36 in.
S of M—5 Elec. mach.

PP—2 boilers, total 300 H. P., 1 gen. unit, 250 volts D. C.
Sales Agent, The Wonderland Coal Co., Portsmouth, O.

CLIFTY CONSOLIDATED COAL CO.

PO—Clay, Ky.; SP—Same; CTY—Webster.
No report.

CLIMAX COAL CO.

General Office, Knoxville, Tenn.
Climax and Sunbeam Mines; Drift; Up. Hignite Seam, 41 to 42 in. thick; operate washery.
PO—Shamrock, Ky. SP — Edgewood, Ky.; CTY—Bell; RR—L. & N., C. V. Div.
PR—L. C. Gunter....Knoxville, Tenn.
TR—H. L. Johnston, " "
GM—R. E. Howe.......Shamrock, Ky.
PA—R. E. Howe, " "
GS—R. E. Howe, " "
MS—H. B. Broughton, " "
MM—H. M. Tackett, " "
EE—R. Silcox " "
SM—M. E. Brown, " "
S of H—3 Elec. loco.; track gauge 44 in.
S of M—5 Elec. mach.
PP—2 Return tubular, Houston and Stanwood & Gamble, boilers, total 300 H. P., gen. unit, 250 volts D. C, 1 pump.
EMP—150. Last fiscal year output 100,000 tons. Sales Agent, S. W. Jayne, Knoxville, Tenn.

CLOVER CREEK COAL CO.

PO—Providence, Ky.; SP—Same; CTY—Webster; RR—L. & N., I. C.
Shaft Mine; No. 11 Seam, 66 in thick.
PR—F. V. Ruckman, Providence, Ky.
TR—D. J. Ruckman, " "
GM—D. J. Ruckman, " "
GS—E. B. Robinson, " "
PA—E. M. Young, " "
MS—B. R. Monroe, " "
EM—Thos. O. Young, " "
MM—Joe. Shade, " "
EE—K. Simpson, " "
SCO—Ruckman Store Co., " "
S of H—Mules.
EMP—90. Output daily, 600 tons.
Successors to Webster County Coal Co.

CLOVER FORK MINING CO.

Clover Fork Mine, Drift, Harlan Seam, 52 in. thick.
PO—Kitts, Ky., SP—Same, CTY— Harlan. RR—L. & N., Clover Fork Br.
PR—Geo. P. Fitz...........Kitts, Ky.
TR—Geo. P. Fitz, " "
GM—B. W. Whitfield, " "
MS—R. H. Wolford, " "
SM—A. F. Whitfield, Jr., " "
SCO—Clover Fork Coal Co.Store," "
S of H—4 elec. locos.; track gauge 42 in.
S of M—6 elec. mach.
PP—Buy power.
EMP—120. Last fiscal year output 172,619 tons.
Sales Agents, Brewley-Darst Coal Co., Knoxville, Tenn.

COATS, N. A.

Out of business.

COIL COAL CO.

Coil Mine; Shaft; No. 11 Seam; 72 to 78 in. thick.
PO—Madisonville, Ky.; SP—Same; CTY—Hopkins; RR—L. & N.
TR—W. D. Coil......Madisonville, Ky.
GM—W. D. Coil, " "
GS—John Carroll, " "
PA—H. H. Coil, " "
MS—Thomas Simons, " "
MM—W. O. Jones, " "
EE—W. O. Jones, " "
CE—Earl Stone, " "
EM—Earl Stone, " "
SCO—W. D. Coil Mercantile Co. Buyer, F. E. Coil, Madisonville, Ky.
S of H—1—12 ton gasoline loco. Track gauge 42 in.
S of M—4 elec. mach.
PP—2 return tubular boilers, 175 H. P., 1 gen. unit, 250 volts D. C., 2 pumps.
EMP—152. Last fiscal year output 160,000 tons.

COLEMAN MINING CO.

Fox Ridge Mine, Drift, Straight Creek Seam, 42 in. thick.
PO—Cary, Ky., SP—Pineville, Ky., CTY—Bell; RR—L. & N., Straight Creek Branch.
PR—Daniel Scanlon.....Louisville, Ky.
TR—G. T. Rider, " "
VP—C. R. Coleman........Cary, Ky.
GM—C. R. Coleman, " "
PA—C. R. Coleman, " "
GS—A. T. Wilson, " "
MM—Tom Swanner, " "
EM—Johnston & Johnston..Pineville, Ky.
SM—C. R. Coleman..........Cary, Ky.
SCO—Coleman Mining Co., Buyer, C. R. Coleman, Cary, Ky.
S of H—4 elec. locos. Track gauge 36 in.
S of M—10 comp. air machines.
PP—2 Atlas return tubular boilers, total 300 H. P., 1 gen. unit, 250 volts D. C., 1 air comp. and 7 pumps.
EMP—140. Last fiscal year output 70,000 tons.

COLONIAL COAL & COKE CO.
General Office, Pottsville, Pa.
Colonial Mine; Drift; No. 1 Seam; 48 in. thick.
PO—Prestonburg, Ky.; SP—Colonial Station, Ky.; CTY—Floyd; RR—C. & O. Big Sandy division.
PR—E. E. Kaercher......Pottsville, Pa.
TR—C. W. Evans......Prestonburg, Ky.
GM—C. W. Evans, " "
PA—John D. Ray, " "
MS—H. S. Boling, " "
EE—Fred Ervin, " "
EM—W. T. Griffith....Pikeville, Ky.
S of H—Elec. loco; track gauge 42 in.
S of M—5 Elec. mach.
PP—Boilers, 300 H.P., 1 gen. unit, 250 volts D. C.
EMP—90. Last fiscal year output 57,000 tons.

COLUMBIA COAL CO.
Columbia Mine, Drift, Seam, 3 ft. thick.
PO—Gravity, Ky. SP—Middleboro, Ky. CTY—Bell. RR—L. & N., Sou.
PR—E. R. Vowels, ... Gravity, Ky.
GM—F. F. Sharp, " "
MS—M. Cockill, " "
EE—F. Scott, " "
S of H—2 elec. loco. Track gauge 44 in.
S of M—3 elec. machines.
PP—2 Return tubular boilers, total 300 H. P.; gen. unit, 250 volts D. C.; 3 pumps.
EMP—60. Last fiscal year output, 60,000 tons.

COLUMBUS MINING COMPANY, INC.
General Office, Monadnock Bldg., Chicago, Ill
PO—Douglass, Ky.; SP—Raccoon (Prepay Station); CTY—Perry, Ky.; RR L. & N., L. & E. Branch.
PR—C. M. Moderwell.....Chicago, Ill.
TR—J. B. Hilton, " "
PA—J. B. Hilton, " "
GM—A. L. Allais, " "
GS—A. L. Allais, " "
MS—Walter Stevens......Douglass, Ky.
SM—C. A. Reynolds, " "
S of H—Mules and 1 elec. loco.
S of M—2 elec. mach.
PP—1 Erie water tube boiler.
Note—Successors to Raccoon Coal Co. and Douglass Coal Mng. Co.

CONGLETON COAL CO.
PO—Idamay, Ky. SP—Same. CTY—Lee. No report.

CONSOLIDATED COAL CO.
Karnes Mine.
PO—Island, Ky. SP—Same. CTY — McLean. No report.

CONSOLIDATION COAL CO., THE
General Office, Continental Building, Baltimore, Md.
101 Mines in Md., West Va., Pa., and Ky.
Chairman of Board, C. W. Watson, Baltimore, Md.
PR—J. H. Wheelwright, " "
Secy—T. K. Stuart, " "
Mgr. of Trans—W. L. Andrews," "
Genl. Auditor—A. S. Dunham," "
VP—F. S. Landstreet, Bankers Trust Bldg., New York, N. Y.
VP—Geo. T. Watson..Fairmont, W. Va.
TR—S. L. Watson, " "
GM—F. R. Lyon, " "
GM Asst—Brooks Fleming, Jr., Fairmont, W. Va.
PA—A. T. Watson, " "
PA—Asst., F. C. Davis, " "
CE—Frank Haas, " "
CE—Asst., J. C. Gaskill, " "
SM—G. G. Michael.....Van Lear, Ky.
Chief Engineer, All Divisions—John G. Smyth ....Fairmont, W. Va.
Supt. P. & M. Dept.—R. L. Kingsland, Fairmont, W. Va.
Eng. of Tests—R. E. Rightmire, Fairmont, W. Va.
Live Stock Buyer—Frank Amos, Fairmont, W. Va.
Genl. Mgr. of Sales—F. W. Wilshire, Bankers Trust Bldg., New York, N.Y.
Western Mgr. of Sales—E. M. Mancourt, Fisher Bldg., Chicago, Ill.
SUPT—P. & M. Dept.—(Miller's Creek Div.) A. E. Griffith, Van Lear, Ky.
GM—(Miller's Creek Div.) Garner Fletcher, Van Lear, Ky.
CHIEF ENG—(Miller's Creek Div.) F. A. Vockrodt, Van Lear, Ky.
EE—(Miller's Creek Div.) A. E. Griffith, Van Lear, Ky.
SCO—The Consolidation Store Co., Van Lear, Ky. Buyer, A. T. Watson, Fairmont, W. Va.

Central Power Plant, 4 Erie City water tube boilers, total 1,000 H. P., 2 750 turbine steam, gen. units, 4,000 volts A. C., 3 phase. Sales Agent, F. W. Wilshire, New York, N. Y.

No. 151 Mine; Drift; Miller's Creek Seam No. 1, 33 to 54 in. thick.
PO—Van Lear, Ky.; SP—Van Lear Jct., Ky.; CTY—Johnson; RR—Miller's Creek, C. & O.
MS—W. Zuendorff......Van Lear, Ky.
S of H—7 Elec. loco.; track gauge, 42 in.
S of M—11 elec. mach.
PP—From central plant. 3 pumps.
EMP—128. Last fiscal year output 113,237 tons.

No. 152 Mine; Drift; Miller's Creek No. 1 Seam, 36 to 54 in. thick.
PO—Van Lear, Ky.; SP—Van Lear Jct., Ky.; CTY—Johnson; RR—Miller's Creek, C. & O.
MS—W. Zuendorff......Van Lear, Ky.
S of H—4 Elec. loco.; track gauge, 42 in.
S of M—9 Elec. mach.
PP—From central plant. 5 pumps.
EMP—86. Last fiscal year output 87,416 tons.

No. 153 Mine; Drift; Miller's Creek Seam No. 1, 34 to 54 in. thick.
PO—Van Lear, Ky.; SP—Van Lear Jct., Ky.; CTY—Johnson; RR—C. & O. Miller's Creek R. R.
MS—W. Zuendorff.......Van Lear, Ky.
S of H—5 Elec. loco.
S of M—8 elec. mach.
PP—From central plant. 5 pumps.
EMP—203. Last fiscal year output 107,850 tons.

No. 154 Mine; Drift; Miller's Creek Seam No. 1, 36 to 54 in. thick.
PO—Van Lear, Ky.; SP—Van Lear Jct., Ky.; CTY—Johnson; RR—Miller's Creek, C. & O.
MS—G. C. Wolfe........Van Lear, Ky.
S of H—10 Elec. loco.
S of M—10 elec. mach.
PP—From central plant. 3 pumps.
EMP—147. Last fiscal year output 217,131 tons.

No. 155 Mine; Slope; Miller's Creek Seam No. 1, 36 to 54 in. thick.
PO—Van Lear, Ky.; SP—Van Lear Jct., Ky.; CTY—Johnson; RR—Miller's Creek, C. & O.
MS—G. C. Wolfe........Van Lear, Ky.
S of H—4 elec. loco.
S of M—9 elec. mach.
PP—From central plant.
EMP—140. Last fiscal year output 76,428 tons.
MGR—(Elkhorn Div.) G. M. Gillette, Jenkins, Ky.
Chief Eng.—(Elkhorn Div.) L. B. Abbott, Jenkins, Ky.
SM—(Elkhorn Div.) J. C. Hunsaker, Jenkins, Ky.
PP—Central power plant; 6 B. & W. water tube boilers, total 2580 H. P.; 2 gen units, 2300 volts A. C., 3 phases, 60 cycles.

Consolidation Nos. 201 Mine; Drift; Elkhorn Seam, 79 to 110 in. thick.
PO—Burdine, Ky.;; SP—Jenkins, Ky.; CTY—Letcher; RR—B. & O., S. V. & E. Br.
MS—W. H. R. Thomas, Burdine, Ky.
SM—H. Kirschman " "
S of H—Mules and 4 elec. locos. Track guage 42 in.
S of M—5 elec. machines.
PP—1 Erie City return tubular boiler, total 125 H. P., 4 gen. units, 176 volts A. C., 3 phase, 60 cycles, and 275 volts D. C.; 9 pumps, power from central plant.
EMP—200. Last fiscal year output 222,528 tons.

Consolidation No. 202 & 203 Mines; Drifts; Elkhorn Seam; 79 to 110 in. thick.
PO—Jenkins, Ky.; SP—Same; CTY—Letcher; RR—B. & O., S. V. & E. Br.
MS—A. E. Rapport.......Jenkins, Ky.
SM—W. G. Francis,.....Jenkins, Ky.
S of H—Mules and 5 elec. loco. Track gauge 42 in.
S of M—6 elec. machines.
PP—2 Erie City return tubular boilers, 200 H. P., 2 gen. units, 175 volts A. C., 3 phase, 60 cycles, and 275 volts D. C., 21 pumps. Power from central plant.
EMP—222. Last fiscal year output 143,375 tons.

Consolidation Nos. 204 and 205 Mines; Drifts; Elkhorn Seam; 79 to 110 in. thick.
PO—Jenkins, Ky.; SP—Same; CTY—Letcher; RR—B. & O., S. V. & E. Br.
MS—W. H. Price........Jenkins, Ky.
SM—F. H King " "
S of H—Mules and 6 elec. locos. Track gauge 42 in.
S of M—11 elec machines.
PP—2 Erie City return tubular boilers, total 225 H. P., 4 gen units, 176 volts A. C., 3 phase, 60 cycles and 481 volts D. C., 32 pumps. Power from central plant.
EMP—433. Last fiscal year output 576,675 tons.

Consolidation Nos. 206, 207 and 208 Mines; Drifts; Elkhorn Seam, 79 to 110 in. thick.
PO—Dunham, Ky.; SP—Jenkins, Ky.; CTY—Letcher; RR—B. & O., S. V. & E. Br.
MS—E. J. Nield, ...Dunham, Ky.
SM—A. B. Venters " "
S of H—Mules and 4 elec. locos. Track gauge 42 in.
S of M— 8 elec. machines.
PP—2 return tubular boilers, total 300 H. P., 4 gen. units, 176 volts A. C., 3 pahse, 60 cycles, and 275 volts D. C., 22 pumps. Power from central plant.
EMP—382. Last fiscal year output 314,066 tons.

Consolidation Nos. 210, 211 212, and 213 Mines; Drifts; Elkhorn Seam; 73 to 100 in. thick.
PO—McRoberts, Ky.; SP—Same; CTY—Lecher; RR—L. & N., L. & E. Br.
MS—J. M. Freeman.....McRoberts, Ky.
SM—J. B. Dailey " "
S of H—Mules and 11 elec. loco. Track gauge 42 in.
S of M—9 elec. mach.
PP—1 Erie City return tubular boiler, total 45 H. P., 8 gen. units, 176 volts A. C., 3 phase, 60 cycles and 275 volts D. C., 13 pumps. Power from central plant and substation at 211 mine.
EMP—319. Last fiscal year output 202,488 tons.

Consolidation Nos. 214 and 215 Mines; Drifts; Elkhorn Seam; 73 to 100 in. thick.
PO—McRoberts, Ky.; SP—Same; CTY—Letcher; RR—L. & N., L. & E. Br
MS—A. B. Brooke......McRoberts, Ky.
SM—J. B. Dailey " "
S of H—Mules and 9 elec. loco. Track gauge 42 in.
S of M—8 elec. mach.
PP—2 Erie City return tubular boilers, total 250 H. P., 4 gen. units, 176 volts A. C., 3 phase, 60 cycles, and 275 volts D. C., 16 pumps. Power from central station and from substation at 214 mine.
EMP—329. Last fiscal year output 268,315 tons.

CONTINENTAL COAL CORPORATION.
See Federal Coal Co.

CORYDON COAL CO.
Corydon Mine, Shaft, No. 12 Seam, 4 ft. 8 in. to 5 ft. 4 in. thick.
PO—Corydon, Ky. SP—Same. CTY—Henderson. RR—I. C.
PR—J. L. Jones, ... Corydon, Ky.
TR—T. E. Jones, " "
GM—T. E. Jones, " "
SM—T. E. Jones, " "
PA—T. E. Jones, " "
EM—Wm. Richardson, " "
S of H—Mules. Track gauge 42 in.
S of M—Hand.
PP—2 return tubular boilers, total 250 H. P., 2 air compressors, 2 pumps.
EMP—20. Last fiscal year output 20,000 tons. Sales Mgr., T. E. Jones.

CRABTREE COAL MINING CO.
Crabtree Mine; Drift; No. 9 Seam, 66 in. thick.
PO—Ilsley, Ky.; SP—Same; CTY—Hopkins; RR—Ill. Cent., Louisville Div.
PR—Edward Ilsley, ..Philadelphia, Pa.
GM—R. M. Salmon, ...Ilsley, Ky.
TR—R. M. Salmon, " "
GS—R. M. Salmon, " "
PA—R. J. Salmon, " "
MS—R. J. Salmon, " "
CE—Ben. W. Robinson, " "
MM—Chas. Martin.........Ilsley, Ky.
EE—Charley Martin, " "
SCO—Address the Company.
S of H—1 steam and 33 elec. locos., rope and mules.
S of M—20 comp. air mach.
PP—10 return tubular boilers, 2 compressors, 2 pumps.
EMP—200. Last fiscal year output 100,000 tons.

CREECH COAL COMPANY
Nos. 1 and 2 Mines; Drift; Wallins Seam; 72 to 92 in. thick.
PO—Wallins Creek, Ky.; SP—Same; CTY —Harlan; RR— L & N., W. & B. M. branch.
PR—R. W. Creech,.......Pineville, Ky.
GM—R. W. Creech, " "
TR—T. F. Gibson, " "
CE—G. W. Creech, " "
EM—G. W. Creech, " "
SM—Guy Vinson....Wallins Creek, Ky.
SCO—Creech Coal Co. " "
S of H—Elec. locos.
S of M—Elec. mach.

CRESCENT COAL CO.
General Office, Nashville, Tenn.
Crescent Mine, Shaft, W. Kentucky No. 9 Seam, 5 to 6 ft. thick.
PO—Bevier, Ky. SP—Same. CTY— Muhlenberg. RR—L.&N., O.&N. Div.
PR—W. R. Cole, ... Nashville, Tenn.
VP—Wm. H. Lindsay..Nashville, Tenn.
TR—F. P. Wright, ... Bevier, Ky.
SEC—F. P. Wright, " "
GM—F. P. Wright, " "
PA—F. P. Wright, " "
MS—F. P. Wright, " "
MM—W. W. Graham, " "
CE—Frank S. Washburn, Nashville, Tenn
SCO—Crescent Coal Co. Buyer, Jno. L. Faughender, Bevier, Ky.
S of H—Mules and 3 elec. loco. Track gauge 36 in.
S of M—10 elec. chain breast mach.
PP—4 return tubular boilers, total 600 H. P., 2 gen. units, 250 volts D.C., 4 pumps.
EMP—250. Last fiscal year output 257,000 tons.

CRYSTAL COAL CO.
Crystal Mine; Drift; L. Hignite Seam, 42 to 50 in. thick. Operate washery.
PO—Logmont, Ky.; SP—Ellwood, Ky.; CTY—Bell; RR—L. & N., Stony Fork branch.
PR—L. C. Gunter......Knoxville, Tenn.
TR—S. W. Jayne, " "
VP—R. E. Howe........Shamrock, Ky.
GM—R. E. Howe, " "
ME—J. C. Richardson,..Middlesboro, Ky.
S of H—3 elec. locos., track gauge 44 in.
S of M—5 elec. mach.
PP—3 water tube boilers, 350 H. P., 1 gen. unit, 250 volts D. C., 2 pumps.
EMP—125. Last fiscal year output 80,000 tons.

CUMBERLAND CANNEL COAL CO.
General office, Lex, W. Va.
One Mine in Kentucky and 1 Mine in West Virginia.
Cumberland Cannel Coal Co. Mine; Davy Seam; 32 in. thick.
PO—Wallins Creek, Ky; SP—Same; CTY —Harlan.
PR—James P. Flanagan..Lex, W. Va.
TR—Thomas Flanagan, " "
GM—James P. Flanagan, " "
GS—J. B. Miller....Wallins Creek, Ky.
PA—J. B. Miller, " "
SM—J. B. Miller, " "
CE—Vest & Coffer, " "
EM—G. J. Cooper........Lex, W. Va.
S of H—Mules.
S of M—Hand.
EMP—20. Last fiscal year output 480,000 tons.
Sales agent, J. H. Henchey, Welch. W. Va.

CUMMINGS & DAY.
Ellis Mine; Shaft; 42 to 54 in. thick.
PO—Deanfield, Ky.; SP—Same; CTY—Ohio; RR—Ill. Central.
MS—John W. Day.......Deanfield, Ky.
S of H—Mules.
Note—Do not ship any coal.

DANIEL BOONE COAL CO.
General Office, Columbus, Ohio.
No. 1 Mine; Drift; No. 4 Seam; 38 to 44 in. thick.

PO—Lennut, Ky.; SP—Same; CTY—Perry; RR—L. & E., Eastern Kentucky branch.
PR—H. H. Heiner.......Columbus, O.
TR—G. H. Barker.......Columbus, O.
GM—H. H. Heiner " "
CE—F. A. Ray " "
GM—Asst., W. J. Brown Jr., Lennut, Ky.
PA—W. J. Brown, Jr. " "
MS—T. B. White, " "
EM—Atkins & Denham.....Hazard, Ky.
SB—D. E. Badington......Lennut, Ky.
S of H—3 elec. locos. Track gauge 42 in.
S of M—7 comp. air machines.
PP—1—150 K. W. Motor Generator, 2,300 volts A. C., 250 volts D. C., 3 phase, 60 cycles, 2 pumps. Power purchased.
EMP—100. Last fiscal year output, 100,000 tons.
Sales Agency, Maynard Coal Co., Columbus, O.
Successor to North Fork Coal Co.

DAVIS COAL CO
Davis Mine; Drift; 36 to 48 ins. thick.
PO—Jackson; SP—Same; CTY—Breathith; RR—L. & N.
General Office, ... Jackson, Ky
PR—R. T. Davis, " "
TR—M. Needham, " "
GM—R. T. Davis, " "
GS—R. T. Davis, " "
PA—Hugh Needham, " "
CE—W. S. Canning, " "
EM—W. S. Canning, " "
S of H—Mules and rope.
S of M—Hand.
SCO—Sewell Ford & Co., " "
Buyer, Hugh Needham,.. Jackson, Ky.
EMP—50. Last fiscal year output 18,000 tons.

DAVIS, HENRY & CO.
Jackson, Ky. No report.

DIAMOND BLOCK COAL CO., INC.
Drift Mine; Fire Clay or No. 4 Kentucky River Seam; 48 to 60 in. thick.
PO—Hazzard, Ky.; SP—Karl's; CTY—Perry; RR—L. & N. and L. E.
PR—Randolph Harrison, Lynchburg, Va
TR—G. H. Wilkins " "
GM—R. F. Haskins, Jr...Hazzard, Ky.
EM—R. F. Haskins, Jr. " "
PA—R. F. Haskins, Jr., " "
EE—W. H. Meadows, " "
SCO—Diamond Block Coal Co. Store. Buyer, W. B. Haynes, Hazard, Ky.

S of H—1 ele clocomotive.
S of M—3 elec. mach.
PP—1 100 K. W. Rotary Con., 440 volts A. C., 60 cycles, 3 phase, and 75 D. C. Power purchased.
EMP—50. Began shipping coal Feb., 1916.

DIAMOND COAL CO.

Diamond Mine; Drift; No. 9 Seam, 4½ to 5 ft. thick.
PO—Providence, Ky. SP—Upland, Ky. CTY—Webster. RR—L. & N., Morganfield Branch.
PR—R. L. Jackson, .. Providence, Ky.
GM—S. D. Palmer, " "
GS—S. D. Palmer, " "
PA—S. D. Palmer, " "
SM—J. Hardy Cullen, " "
MS—S. C. Loften, " "
EM—M. C. Palmer, " "
MM—Leman Edwards " "
S of H—Rope. Track gauge 42 in.
S of M—12 Comp. air mach.
PP—2 return tubular boilers, total 300 H.P., 1 haulage engine, 1 air comp. and 3 pumps.
EMP—125. Last fiscal year output 95,000 tons. Sales Agent, J. E. Palmer.

DRAKE BLUE GEM COAL COMPANY

Drake No. 1 and 2 Mines; Drift; Blue Gem Seam; 26 to 30 in. thick.
PO—Packard, Ky.; SP—Nevisdale, Ky., (Prepay); CTY—Whitley; RR—L. & N.; Pine Mt. Branch.
PR—T. B. Mahan....Williamsburg, Ky.
TR—T. J. Roberts........Packard, Ky.
GM—B. E. Cheely " "
PA—B. E. Cheely " "
GS—Archie Stott " "
EM—Archie Stott " "
SB—B. E. Cheely, " "
S of H—Mules. Track gauge 36 in.
S of M—Hand.
EMP—90. Last fiscal year output 24,000 tons. Sales Agency, Southern Coal & Coke Co., Knoxville, Tenn.
Note—Successors to the Dixie Coal Co.

DUNCAN, W. G., COAL CO.

General Office, Greenville, Ky.
PR—W. G. Duncan, .. Greenville, Ky.
TR—A. W. Duncan......Greenville, Ky.
GM—C. W. Taylor, " "
PA—C. W. Taylor, " "
EM—W. G. Duncan, Jr., " "
CE—D. W. Christian, " "
MM—D. W. Christian....Greenville, Ky.
Graham, Skibo and Luzerne Mines; Slopes and Drifts; No. 9 Seam, 57 to 66 in. thick.
PO—Luzerne and Graham, Ky.; SP—Same CTY—Muhlenberg.
S of H—8 Elec' loco. track gauge 39 in.
S of M—30 Elec. mach.
PP—7 Return tubular boilers, total 1,050 H. P., 2 gen. unit, 2,500 volts A. C., 3 phase, 60 cycles, 10 pumps.
EMP—750. Last fiscal year output 550,000 tons.

E. M. T. COAL COMPANY

General Office, London, Ky.
E. M. T. Coal Co. Mine; Shaft; No. 9 Coal Seam 54 to 60 in. thick.
PO—Island, Ky.; SP—Same; CTY—McLean; RR—L. & N.
PR—D. C. Edward........London, Ky.
TR—L. B. McHargue, " "
GM—H. C. Thompson, " "
S of H—1 elec. loco.
S of M—4 elec. mach.
PP—3 Erie return tubular boilers, total 300 H. P., 2 gen. units, 500 volts D. C., 1 pump.

EAGLE COAL CO.

Receiver, D. W. Jones, 524 Colo. Savings & Trust Bldg., Columbus, O.
Barren Fork Mine, 30 in. thick.
PO—Flat Rock, Ky.; SP—Same; CTY——McCreary; RR—Q. & C.
PR—G. H. Durell........Cleveland, O.
PA—A. C. Dagne, " "
MS—J. W. Burriss....Barren Fork, Ky.
S of H—Mules and 3 steam loco.
PP—3 pumps.
Note—Not operating since Dec. 17, 1914.

EAST FORK COAL CO.

Sturgell Mine; Drift; No. 7 Seam, 24 to 72 in. thick.
PO—Princess, Ky.; SP—Same; CTY—Boyd; RR—A. C. I.
PR—J. D. Sturgell......Princess, Ky.
GM—J. D. Sturgell, " "
MS—J. D. Sturgell, " "
TR—Lille Sturgell, " "
EM—George Stevens, " "
S of H—Mules.
S of M—Hand.
PP— 1 Pump.
Sales Agency, Kentucky Gem Coal Co., Rush, Ky.

EAST HARLAN COAL COMPANY

General Office, Ages, Ky.
Drift Mine; Harlan Seam; 42 to 63 in. thick.
PO—Ages, Ky.; SP—Same; CTY—Harlan; RR—L. & N., Wasioto & Black Mountain Div.
PR—W. W. Lewis.........Harlan, Ky.
TR—J. W. Farmer, " "
GM—J. L. Smith...........Ages, Ky.
GS—J. L. Smith, " "
PA—Geo. F. Neel, " "
SM—Geo. F. Neel, " "
MS—James Hyatt, " "
CE—Paul Francis, " "
EM—Paul Francis, " "
MM—Milton Bryant, " "
SCO—East Harlan Coal Co. Store.
S of H—Electric.
S of M—Elec. mach.
PP—Purchase Power.
EMP—75. Last fiscal year output, 45,000 tons.
Note—Successors to Ages Ridge Coal Co.

EAST JELLICO COAL CO.

East Jellico Mines; Drift; Dean Seam, 5 to 7 ft. thick.
PO—Tinsley, Ky.; SP—Surran Ky.; CTY—Bell; RR—L. & N.
PR—A. G. Corbett........Clarion, Pa.
TR—C. W. Bell,..........Tinsley, Ky.
GM—C. W. Bell, " "
GS—Geo. A. Clutts, " "
PA—O. C. McClung, " "
MM—R. F. Broyles, " "
EE—R. F. Broyles, " "
SM—J. M. Warren, " "
CE—Johnson & Johnson, ..Pineville, Ky.
S of H—3 Elec. loco. and mules; track gauge 40 in.
S of M—3 elec. mach and hand.
PP—2 Return tubular boilers total 350 H. P., 1 gen. unit 250 volts D. C., 1 comp., 2 pumps.
EMP—200. Last fiscal year output 107,000 tons.
Sales Agent, M. G. Yingling, Lexington, Ky.

EAST KENTUCKY COAL CO.

Out of business.

EAST TENNESSEE COAL COMPANY.

General Office, Knoxville, Tenn.
Glomawr Mine; Drift; Seam 50 to 60 in. thick.
PO—Glomawr, Ky.; SP—Same; CTY—Perry; RR—L. & N.
PR—Howell J. Davis....Knoxville, Tenn.
TR—Howell J. Davis, " "
GM—W. E. Davis..........Hazard, Ky.
MS—W. L. Potter........Glomawr, Ky.
PA—W. E. Davis..........Hazard, Ky.
SCO—East Tennessee Coal Co., Buyer, H. Monhollen, Glomawr, Ky.
S of H—2 elec. locos. Track gauge 42 in.
S of M—3 elec. mach.
PP—2 boilers, total 300 H. P., also buy power.
EMP—125. Last fiscal year output 23,332 tons.

EASTERN KENTUCKY COAL CO., (THE)

General Office, Mount Vernon, Ohio.
Louisa Mine; Drift; Seam 48 in. thick. thick.
PO—Torchlight, Ky., SP—Same, CTY—Lawrence, RR—C. & O., Big Sandy Dis.
PR—F. S. McConnell..Mt. Vernon, O
TR—E. H. Fairchild, " "
GM—F. S. McConnell, " "
GS—R. C. Simpson.....Torchlight, Ky.
PA—R. C. Simpson, " "
MS—R. C. Simpson, " "
CE—W. B. Hanlon.......Cleveland, O.
SCO—Eastern Kentucky Coal Co., Buyer, Carl Compton, Torchlight, Ky.
S of H—4 Elec. loco. track gauge 36 in.
S of M—6 Elec. machines.
PP—2 Union Iron Works return tubular boilers, 2 water tube boilers, total 700 H. P., 2 gen. units, 250 volts D. C., 1 pump.
EMP—100.

EL. COAL COMPANY

Gatliff, Ky. No report.

ELKHORN COAL CO.

Kona Mine; Elkhorn Seam, 58 to 66 in. thick.
PO—Mater, Ky.; SP—Kona, Ky.; CTY—Letcher; RR—Lexington & Eastern.
PR—S. L. Bastin, Lexington, Ky.
TR—J. Henry Hall, Mater, Ky.
GM—J. Henry Hall, " "
MS—J. Henry Hall, " "
S of H—Mules.
S of M—Hand.
EMP—100. Last fiscal year output 75,000 tons.

ELKHORN CONSOLIDATED COAL & COKE CO..

Lower and Upper Elkhorn and Coaldale Mines; Drift; L. & Up. Elkhorn Seam; 46 to 48 in. thick.
PO—Hellier, Ky.; SP—Same; CTY—Pike, RR—C. & O.
PR—Fon Rogers.........Pikeville, Ky.
TR—Lon Rogers, " "
GM—Lon Rogers, " "
PA—Lon Rogers, " "
MS—Lon Rogers, " "
VP—J. L. Rogers......Greenville, Ky.
CE—Edward Holly.......Pikeville, Ky.
MM—Jos. B. Rogers, " "
EE—Ed Chinn, " "
S of H—7 elec. loco. and mules. Track gauge 48 in.
S of M—11 elec. mach.
PP—3 boilers, total 800 H. P., 1—150 K. W. and 1—300 K. W. gen. units, 250 volts D. C.
Coke ovens 60 Bee Hive. Last fiscal year output 162,348 tons. Sales Agency, Matthew Addy & Co., Cincinnati, O.

ELKHORN GAS COAL MINING CO.

General Office, Milwaukee, Wis.
PO—Weeksburg, Ky.; CTY—Floyd.
GM—C. D. Weeks.....Milwaukee, Wis.
GS—C. C. Dunn.......Weeksburg, Ky.
MS—C. C. Dunn......Weeksburg, Ky.
Have not started mining for the market on account of lacking railway facilities.

ELK HORN MINING CORP.

General Office, New York, N. Y.
PR—C. W .Watson....New York, N. Y.
PA—G. S. Kinzer........Wayland, Ky.
Chief Eng—H. S. Estill, " "
CE—Frank Haas......Fairmont, W.Va.
EE—E. Hutton...........Fleming, Ky.
Sales Agency, Consolidation Coal Co., New York, N. Y.

Nos. 301, 302, 307 Mines; Drifts, Elk Horn; Seam 60 to 144 in. thick.
PO—Fleming, Ky.; SP—Same; CTY—Letcher; RR—Lexingon & Easern.
GM—(Mineral Div.) Thomas O. Haymond and R. F. Cole.....Fleming, Ky.
MS—J. C. Babb, " "
S of H—6 Elec. loco.; track gauge 42 in.
S of M—5 Elec. mach.
PP—Gen. units A. C., 3 phase, 60 cycles; 4 pumps; power purchased.

Nos. 303, 304, 305, 306 Mines; Drifts; Elk Horn Seam, 60 to 144 in. thick.
PO -Fleming, Ky.; SP—(303-304) Haymond, Ky.; (305-306) Hemphill, Ky.; CTY—Letcher; RR—Lexington & Eastern.
GM—(Beaver Div) H. S. Carpenter, Wayland, Ky.
MS -M. B. Mitchell......Fleming, Ky.
S of H—8 Elec. loco.; track gauge 42 in.
S of M—7 Elec. mach.
PP—Gen. units A. C., 3 phase, 60 cycles; 8 pumps; power purchased.
EMP——Total 500.

325-331 inc. Mine; Drift; Elkhorn Coking Seam; 60 in. thick.
PO—Wayland, Ky.; SP—Same; CTY—Floyd; RR—C. & O. Elkhorn & Beaver Valley Br.
MS—M. H. Evans and W. H. Finley, Wayland, Ky.
S of H—12 elec. locos.
S of M—16 elec. machines.
PP —Power purchased.
EMP—296. Last fiscal year output 100,255 ton.
Successors to the Mineral Fuel Co.

ELKHORN & SHELBY CREEK COAL CO.

General Office, Jenkins, Ky.
Caney Mine, Drift, Up and L. Elkhorn Seam, 8 ft. 4 in. thick.
PO —Esco, Ky.; SP—Same; CTY—Pike; RR—Sandy Valley and Elkhorn.
PR—C. G. Evans,......Jenkins, Ky.
TR—A. L. Bennett. " "
GM—W. J. Christopher, Penny, Ky.
S of H—1 Elec. loco. and mules; track gauge 48 in.
S of M—Elec. mach.
PP—1 Erie boiler, 100 H. P., gen. unit 250 volts D.C.
Will have a daily output of 700 tons.

EMPIRE COAL MINING CO.

General Office, Empire, Ky.
Empire Mines. Shaft; No. 1 Seam; 36 to 52 in. thick.
PO—Empire, Ky.; SP—Same; CTY—Christian; RR—L. & N., Henderson Div.
PR—John D. Hutton..Shelbyville, Tenn.
TR—G. Bibb Jacobs.......Empire, Ky.
GM—B. Bibb Jacobs, " "
PA—G. Bibb Jacobs, " "
GS—George Wales, " "
EM—George Wales, " "
MS—Dolph Woodruff, " "
EE—M. M. Paris, " "
SCO—Empire Coal Mining Co. Store. Buyer, G. Bibb Jacobs, Empire, Ky.
S of H—Elec. loco. Track gauge 40 in.
S of M—3 elec. mach.
PP—3 boilers,, gen. units, 500 volts D. C., 3 pumps.
EMP—112.
Note—Known previously as Empire Coal Co.

ESTES JELLICO COAL CO.

Craley Mine; Drift; Jellico Seam; 34 to 42 in. thick.
PO—Pleasant View, Ky.; SP—Same; CTY—Whitley; RR—L. & N.
PR—C. C. Stampill, Pleasant View, Ky.
TR—S. P. Estes, " "
GM—J. F. Estes, " "
GS—J. F. Estes, " "
SM—J. F. Estes, " "
MS—Frank Carter, " "
S of H—Mules. Track gauge 36 in.
S of M—Hand.
EMP—50.
Note—Successors to Pleasant View Jellico Coal Company.

EUREKA COAL CO.

Blue Gem Mine; Drift; Blue Gem Seam, 24 to 30 in. thick.
PO—Gatliff, Ky.; SP—Same; CTY—Whitley; RR—L. & N., Pine Mt. Br.
PR—W. N. Woodward....Jellico, Tenn.
TR—Chas. Hughes, " "
GM—F. M. Angel........Gatliff, Ky.
PA—F. M. Angel, " "
MS—F. M. Angel, " "
S of H—Mules; track gauge 36 in.
S of M—Hand.
EMP—25.

FAIRMONT MINING COMPANY.

Fairmont Mine, Drift, No. 9 Seam, 4½ to 5 ft. thick.
PO—Blackford, Ky. SP—Wheat Crop, Ky.; CTY—Webster. RR—Illinois Central, Providence Br.
PR—W. F. Shinall,....Blackford, Ky.
GM—W. F. Shinall, " "
PA—W. F. Shinall, " "
TR—Luke Mitchel, " "
MS—Luke Mitchel, " "
MM—W. B. Barnes, " "
S of H—Rope; track gauge 36 in.
S of M—1 Elec. mach.
PP—1 water tube boiler, 100 H. P., 2 gen. units, 250 volts, D. C.; 1 pump.
EMP—32. Last fiscal year output 13,000 tons. Sales agent, W.F. Shinall, Blackford, Ky.
(Old information.)

FEDERAL COAL COMPANY.

General office, Straight Creek Ky.
PR—T. R. Preston, Chattanooga, Tenn.
TR—A. G. Stith, Louisville, Ky.
GM—M. S. Barker, ..Straight Creek, Ky.
GS—H. D. Easton, " " "
PA—F. M. Meadows, " " "
ASST. SUPT—D. A. MacWhirter, Straight Creek, Ky.
EM—R. R. Atkins, " " "
MM—Porter Scholl, " " "
EE—Tom Kirk, " " "
SCO—Address the Company, Buyer,—F. M. Meadows, Straight Creek, Ky.

Barker Mine; Drift; Straight Creek Seam; 36 to 48 in. thick.
PO—Straight Creek, Ky; SP—Pineville, Ky; CTY—Bell; RR—L. & N., Straight Creek branch.
S of H—Mules and 7 elec Locos. Track gauge 43 in.
S of M—3 elec, and 23 comp, air machines
PP—1 Water tube boiler, 2 return tubular boilers, 2 gen. unit, 250 volts D. C., 1 pump and 1 air compressor.
EMP 250. Last fiscal year output, 175,082 tons. 200 Bee Hive Coke Ovens.

Castro Mine; Drift; Straight Creek Seam; 42 in. thick.
PO—Cary, Ky; SP—Pineville; CTY—Bell; RR—L. & N.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—1 Pump
EMP—100. Last fiscal year output, 53,507 tons.

Cary Mine; Drift; Straight Creek Seam, 42 in. thick.
PO—Cary, Ky; SP—Pineville; CTY—Bell; RR—L. & N.
S of H—Mules. Track gauge 42 in.
S of M—Hand.
PP—1 return tubular boiler.
EMP—112. Last fiscal year output, 75,042 tons.

Glendon Mine; Drift; Straight Creek Seam; 42 in. thick.
PO—Arjay, Ky; SP—Pineville; CTY—Bell; RR—L. & N.
S of H—Mules and 2 elec. locos. Track gauge 42 in.
S of M—4 elec. machs.
PP—2 Return tubular boilers, total 200 H. P., 1 gen. unit, 250 volts D. C.
EMP—125. Last fiscal year output, 101,122 tons.

Arjay Mine; Drift; Straight Creek Seam; 42 in. thick.
PO—Arjay, Ky; SP—Pineville; CTY—Bell RR—L. & N.
S of H—Mules and 2 elec., 1 steam and 1 gasoline loco. Track gauge 42 inches.
S of M—Hand.
PP—Receive power from Glendon Mine;
EMP—150. Last fiscal year output, 124,494 tons.

Wallsend Mine; Drift Straight Creek Seam; 36 in. thick.
PO—Wallsend, Ky; SP—Pineville, Ky; CTY—Bell; RR—L. & N.
S of H—Mules and 1 elec. loco. Track gauge 36 in.
S of M—2 elec, machs.
PP—4 return tubular boilers, 2 gen. units, 250 volts D. C.
EMP—25. Last fiscal year output, 31,579 tons.
Note—Successors to the Continental Coal Corporation.

FERNDALE COAL CO., THE
Ferndale Mine, Drift, "Barner" Seam, 36 in. thick.
PO—Pineville; SP—Ferndale, Ky.; CTY—Bell; RR—L. & N.
PR—J. C. Knuckles......Pineville, Ky.
GM—J. C. Knuckles, " "
PA—J. C. Knuckles, " "
TR—H. K. Knuckles, " "
MS—James Romine.......Ferndale, Ky.
EM—A. B. Cullan, " "
GS—W. M. Cole, " "
SCO—Ferndale Coal Co. Buyer, J. C. Knuckles, Ferndale, Ky.
S of H—Mules; track gauge 42 in.
S of M—Hand.
PP—1 pump.
EMP—25. Last fiscal year output 10,000 tons.

FIRST CREEK COAL CO.
General Office, Knoxville, Tenn.
Dowlais Mine; Drift; No. 6 Seam; 70 to 75 in. thick.
PO—Typo, Ky.; SP—Dowlais, Ky.; CTY—Perry RR—L. & N., First Creek Spur.
PR—W. E. Davis.........Hazard, Ky.
GM—W. E. Davis, " "
TR—H. J. Davis......Knoxville, Tenn.
GS—Ivor Livingston.........Typo, Ky.
SM—Fred W. Butler.........Typo, Ky.
S of H—Electric loco.
S of M—Elec. chain machine.
PP—Power purchased.

FLOYD MINING CO.
Cedar Point Mine; Drift, No. 3 Miller Creek Seam.
PO—Emma, Ky.; SP—Woods Station, Ky.; CTY—Floyd; RR—C. & O.
GM—Henry L. Coe,......Emma, Ky.
MS—Thomas Osey, " "
MM—John Ham, " "
SCO—Address the Company.
S of H—Mules; track gauge 43 in.
S of M—2 Elec. mach.
PP—1 Randall boiler, 40 H.P.
EMP—25. Output 200 tons per day.

FLUHART COLLIERIES CO. (THE)
General Office, 1000-1001 U. B. Bldg., Dayton, Ohio.
Fulhart Mine; Shaft; Kentucky No. 1 Seam, 36 to 44 in. thick.
PO—White House, Ky.; SP—Same; CTY—Johnson; RR—C. & O., Big Sandy Branch.
PR—Theo. Fluhart.......Dayton, Ohio
TR—J. W. Chandley, " "
GM—J. W. Chandley, " "
PA—W. E. Williams, White House, Ky.
MS—W. E. Williams, " "
SM—T. J. Powell, " "
EM—Edward Holly.......Pikeville, Ky.
S of H—2 Elec. loco.; track gauge 42 in.
S of M—6 Elec. mach.
PP 3 Return tubular boilers, total 375 H. P., 2 gen. units, 350 volts D. C., 3 pumps.
EMP—150. Last fiscal year output 75,000 tons. Sales Agent, J. W. Chandley, Dayton, O.

FOUR MILE COAL CO.
Nos. 1, 4 and 5 Mines; Drifts; Straight Creek and Hickory Seams, 68 to 72 in thick.
PO Rim, Ky.; SP—Four Mile, Ky.; CTY—Bell; RR—L. & N., C. V. Div.
PR—W. R. Wood..........Rim, Ky.
GM—W. R. Wood, " "
PA—W. R. Wood, " "
GS—W. R. Wood, " "
EM—Culton & Bailey, Pineville, Ky.
S of H—3 Elec. loco.; track gauge, 44 in.
S of M—7 Elec. mach.
PP—3 Return tubular boilers, 300 H. P., 2 gen. units, 250 volts D. C.
EMP—150. Last fiscal year output, 200,000 tons.
Sales agency, Logan-Pocahontas Fuel Co., Charleston, W. Va.

FOUR SEAM BLOCK COLLIERY CO.
General Office, McDowell, W. Va.
Four Seam Mine; Drift; Kentucky BlockSeam: 44 to 52 in. thick
PO—Hazard, Ky.; SP—Same: CTY—Perry RR—L. & N.
PR—Jarius Collins, Bramwell, W. Va.
TR—E. E. Hartsock, Bramwell, W. Va.
GM—A. A. Gallagher, Hazard, Ky.
PA—A. A. Gallagher, Hazard., Ky.
CE—W. E. Harris, Huntington, W. Va.
S of H—Electric loco.
S of M—Elec. Mach.
PP—Purchase power.

FULKERSON, O. P. & SON
Owensboro, Ky. No report.

GATLIFF COAL CO.
Gatliff Coal Co. Mine, 30 to 54 in. thick.
PO—Gatliff, Ky.; SP—Same; CTY—Whitley RR—L. & N., Pine Mtn. branch.
PR—A. A. Gatliff....Williamsburg, Ky.
VP—N. B. Perkins...Williamsburg, Ky.
TR—N. A. Archer, " "
GM—J. B. Gatliff, " "
GS—John Jones...........Gatliff, Ky.
MS—John Jones, ...Gatliff, Ky.
MM—Wm. Oliver, " "
EM—Wm. Archer, " "
S of H—Mules, gasoline and elec.
S of M—Air and electricity.
SCO—Address the Company. Buyer, L. S. Sofriet, Gatliff, Ky.
PP—6 150 H. P. return tubular boilers, 2 compressors and 1 250 elec. unit.
EMP—About 400. Last fiscal year output 256,845 tons.

GENTRY, TOM
Out of business.

GIBRALTAR COAL MINING CO.
General Office, Memphis, Tenn.
Gibraltar Mine; Shaft; No. 9 Seam, 56 to 64 in. thick.
PO—Mercer, Ky.; SP—Same; CTY—Muhlenberg; RR—I. C.
PR—Robt. L. Brown, Memphis, Tenn.
TR—Robt. L. Brown, " "
GM—J. A. Smith, ...Mercer, Ky.
MM—J. O. Wallace, " "
SCO—Gilbratar Store, " "
S of H—2 Elec. loco.; track gauge 36 in.
S of M—10 Elec. mach.
PP—4 C. J. Walton boilers, total 600 H.P., 2 gen. unit 450 K.W.; 1-250 volts D.C.
EMP—365. Last fiscal year output 200,028 tons.
Sales Agency, Brown Coal Co., Memphis, Tenn.

GENERAL REFRACTORIES CO.
903 Trinity Bldg., New York City.
Drift Mine No. 3 Seam, 36 in. thick.
PO—Hitchins, Ky.; SP—Same; CTY—Carter; RR—C. & O., Lexington Div.
PR—W. C. Sproul........Chester, Pa.
GS—Clayton S. Hitchins, Hitchins, Ky.
MS—George Stevens......Hitchins, Ky.
EM—E. P. Hopkins,....Olive Hill, Ky.
MM—E C. Williams,.....Hitchins, Ky.
EE—E. C. Williams, " "
S of H—Mules and 1 Elec loco.; track gauge 39 in.
S of M—Hand and 1 elec. mach.
PP—2 Rust water tube boilers, total 700 H. P., 2 gen. units, 480 volts A. C., 3 phase, 60 cycles.
EMP—50. Last fiscal year output 45,159 tons.

GOLDEN ASH COAL CO.
General Office, Williamsburg, Ky.
Golden Ash Mine; Drift; Harlan Seam, 42 to 52 in. thick.
PO—Kitts, Ky.; SP—Neubert, Ky. (Prepay); CTY—Harlan, RR—L. & N., Wasioto & Black Mtn. Div.
PR—T. B. Mahan....Williamsburg, Ky.
TR—A. V. Brown, " "
GM—W. A. Ellison..........Kitts, Ky.
PA—W. A. Ellison, " "
SM—W. F. Gatliff, " "
S of H Mules and 3 elec. loco. Track gauge 44 in.
S of M—Hand and 3 elec. mach.
PP—Buy power.
EMP—100. Last fiscal year output 69,598 tons. Sales Agency, Southern Coal & Coke Co., Knoxville, Tenn.

GREASY CREEK COAL CO.
See Pine Ridge Coal Mining Co.

GREENOUGH COAL & COKE CO.
General Office, Shamokin, Pa.
Greenough Mine, Drift, Upper Elkhorn Seam; 36 to 60 in. thick.
PO—Hellier, Ky., SP—Same, CTY—Pike; RR—C. & O., Marrowbone Br.
PR—Edward Brennan....Shamokin, Pa.
TR—K. C. McWilliams, " "
GM—W. J. Freeman......Hellier, Ky.
GS—W. J. Freeman, " "
MS—W. J. Freeman. " "
EM—Edward Holley......Pikeville, Ky.
CE—Edward Holley, " "
SCO—Greenough Store. Buyer, F. R. Ward, Hellier, Ky.
S of H—Mules and comp. air loco.; track gauge 40 in.
S of M—8 comp. air mach.
PP—1 Atlas water tube boiler, 250 H. P., 1 compressor.
EMP—75. Last fiscal year output 44,180 tons. Sales agency, Eaton Rhodes & Co., Cincinnati, Ohio.

GREEN RIVER COAL CO.
Klondike Mine, Drift, No. 9 Seam, 3½ to 5 ft. thick.
PO—Livermore, Ky., SP—Same, CTY—McLean; RR—Green River.
PR—Ed. Austin.......Livermore, Ky.
TR—D. H. Boyken, " "
GM—D. H. Boyken, " "
MS—D. H. Boyken, " "
S of H—Mules; track gauge 38 in.
S of M—Hand.
PP—2 Boilers, total 110 H. P.
EMP—8. Last fiscal year output 3,000 tons

GREEN RIVER COAL & COKE CO.
Green River Mine, Shaft, No. 9 Seam, 4 ft. 2 in. to 4 ft. 9 in. thick.
PO—Island, Ky., SP—Same, CTY—McLean; RR—L. & N., Owensboro & Nashville Div.
PR—John W. Love......New York City.
TR—E. S. Randle........Island, Ky.
GM—E. S. Randle, " "
PA—E. S. Randle, " "
GS—Thos. Blades, " "
SM—J. S. Mattingly, " "
S of H—Mules, tail rope and 1 gasoline motor.
S of M—Hand.
PP—3 return tubular boilers, total 180 H. P., 3 pumps.
EMP—140. Last fiscal year output 90,000 tons. Sales Agent, A. C. Lackey, Nashville, Tenn.

GREENVILLE COAL CO.
General Office, Greenville, Ky.
PR—W. A. Wickliffe....Greenville, Ky.
TR—M. L. Wickliffe, " "
GM—C. M. Martin, " "
GS—C. M. Martin, " "
PA—C. M. Martin, " "
EM—P. R. Wickliffe, " "
EE—P. R. Wickliffe, " "
Sales Mgr., W. A. Wickliffe, Greenville, Ky.

Powderly Mine, Slope, No. 9 West Kentucky Seam, 4 ft. 8 in. to 5½ ft. thick.
PO—Powderly, Ky.; SP—Same, CTY—Muhlenberg; RR—Illinois Central.
MS—Herbert Myers......Powderly, Ky.
EE—Edgar Mitchell......Powderly, Ky.
SM—H. C. Willis. " "
S of H—Mules and 1 elec. loco.; track gauge 36 in.
S of M—9 Elec. machines.
PP—2 Return tubular boilers, total 300 H. P., 1 3-phase 60-cycle motor gen. set, 2300 volts A. C., 3 pumps.
EMP—200. Last fiscal year output 105,198 tons.

Martwick Mine, Shaft, No. 9 West Kentucky Seam, 4 ft. 5 in. to 5 ft. thick.
PO—Martwick, Ky., SP—Same, CTY—Muhlenberg; RR—Illinois Central.
MS—A. J. Mercer......Martwick, Ky.
SM—A. C. Howard, " "
EE—C. Carl Coots......Martwick, Ky.
S of H—Mules, 1 elec. loco., track gauge 42 in.
S of M—11 Elec. machines.
PP—2 Return tubular boilers, total 300 H. P., 1 gen. unit 250 volts D. C., 1 pump.
EMP—180. Last fiscal year output 106,930 tons.

HAMMONDS, GEO.
Hammond Mine, Drift, No. 7 Seam 3 to 4 ft. thick.
PO—Coalton, Ky.; SP—Same; CTY—Boyd; RR—A. C. & V.
PR—Geo. W. Hammond,..Coalton, Ky.
GM—Geo. W. Hammond, " "
PA—Geo. W. Hammond, " "
EM—Joe. L. Simpson, .. Kilgore, Ky.
S of H—Mules. Track gauge 3 ft 7½ in.
S of M—Hand.
EMP—20.

HARRIS COAL COMPANY
Providence, Ky. No report.

HARBISON-WALKER REFRACTORIES CO.
2 Mines in Penna. 1 Mine in Kentucky.
General Office, Farmers Bank Bldg., Pittsburgh, Pa.
Drift Mine, No. 7 Seam, 36 in. thick.
PO—Denton, Ky.; SP—St. Creek Mines, Ky.; CTY—Carter RR—C. & O.
PR—H. W. Croft........Pittsburgh, Pa.
GM—H. W. Croft, " "
TR—Wm. Walker, " "
PA—C. T. Stewart, " "
Successors to the Davys Run Coal Co.

HARLAN GAS COAL CO.
Gastom Mine; Seam 48 to 58 in. thick.
PO—Harlan, Ky.; SP—Gastom, Ky.; CTY—Harlan; RR—L. & N.
PR—E. B. Cornett, ...Harlan, Ky.
TR—W. W. Lewis, " "
GM—D. B. Cornett, " "
GS—W. B. Miller, " "
PA—W. B. Miller, " "
CE—Paul Frances, " "
MM—H. J. Kendy, " "
SM—Carlo Cawood, " "
GS—W. B. Miller, " "
S of H—4 Elec. loco.; track gauge 42 in.
S of M—5 elec. mach.
PP—2 Return tubular boilers, total 300 H.P., 1 gen. unit 250 volts D.C.
EMP—300. Last fiscal year output 180,000 tons.
Successors to the Harlan Town Coal Co.

HARVEY COAL CO.
Drift Mine; No. 6 Seam; 48 to 74 in. thick.
PO—Staub, Ky.; SP—Harveyton, Ky.; CTY—Perry; RR—L. & N.
PR—C. H. Harvey......Knoxville, Tenn.
TR—Fritz Staub, " "
GM—E. L. Douglass......Staub, Ky.
PA—G. P. Foley " "
S of H—1 Storage Battery loco. Track gauge 48 in.
S of M—2 elec. machines.
PP—Power purchased.
Note—Shipped coal January 1, 1916.

HAZARD COAL CO.
General Office, 303 City National Bank Bldg., Lexington, Ky.
Shaft Mine; No. 4 Seam; 44 to 60 in. thick.
PO—Hazard, Ky.; SP—Same; CTY—Perry; RR—L. & E.
PR—Robt. Wedekind....Louisville, Ky.
TR—W. G. Polk.......Lexington, Ky.
GM—John P. Gorman, " "
GS—John P. Gorman, Jellico, Tenn.
PA—W. G. Jenkins.......Hazard, Ky.
EM—G. D. Cummings, " "
MM—A Lavely, " "
MS—P. J. Gorman " "
S of H—Mules and 1 elec. loco.
S of M—20 comp. air mach.
PP—2 Return tubular boilers, total 250 H. P., 1 comp.
EMP—150. Daily output 800 tons.
Sales Agent, W. G. Polk.

HERCULES COAL CO.
General Office, Morganfield, Ky.
Hercules; Shaft; No. 11 Seam, 4½ to 5 ft. thick.
PO—Morganfield, Ky.; SP—Same; CTY—Union; RR—I. C., L. & N.
PR—W. A. Jackson....Evansville, Ind.
GM—R. C. Arnold........Waverly, Ky.
TR—Miss Bess Taylor, Morganfield, Ky.
MS—H. C. Williamson, " "
PA—H. C. Williamson, " "
EM—D. E. Coulton, " "
S of H—Mules; track gauge 39 in.
S of M—Hand.
PP—2 water tube boilers, total 150 H. P., 1 pump.
EMP—35. Last fiscal year output 11,148 tons.
Sales agent, F. J. Kennedy, Morganfield, Ky.

HIGHLAND MINING COMPANY.
Highland Mine, Slope; No. 9 Seam; 5 ft. to 5 ft. 4 in. thick.
PO—Providence, Ky.; SP—Same; CTY—Webster; RR—I. C.
PR—A. J. Ruckman..Las Esperanzas Mex.
TR—D. J. Ruckman.....Providence, Ky.
GM—F. V. Ruckman...Providence, Ky.
GS—E. B. Robinson, " "
PA—E. B. Robinson, " "
MS—Carl Ramsey, " "
EM—Thos. O. Long, " "
MM—J. Aldridge, " "
SCO—Ruckman Store Co. Buyer W. M. Payne, Providence, Ky.
S of H—Mules, rope and 1 gasoline loco., track gauge 42 in.
S of M—Hand.
PP—2 Titusville return tubular boilers, total 225 H. P., 1 pump.
EMP—[illegible] Last fiscal year output 168,700 tons.
Sales Agent, Southern Coal Co., Memphis, Tenn.

HIGNITE COAL MINING CO.
Hignite Mine; Drift; Hignite Seam, 48 in. thick. Operate Washery.
PO—Middlesboro, Ky.; SP—Same CTY—Bell; RR—L. & N.
PR—John Hoffman......Covington, Ky.
TR—E. S. Helburn....Middlesboro, Ky.
GM—E. S. Helburn, Middlesboro. Ky.
EM—C. P. Davidson....Middlesboo, Ky.
PA—W. W. Oakes.......Shamrock, Ky.
MS—Geo. Veal, " "
SM—W. Wooks, " "
S of H—2 Elec. loco. and mules; track gauge 44 in.
S of M—2 Elec. mach.
PP—2 Return tubular, Houston, Stanwood & Gamble boilers 275 H. P.; 1 gen. unit 250 volts D. C., 1 pump.
EMP—100. Last fiscal year output 98,000 tons. Sales Agent, E. S. Helburn, Middleboro, Ky.

HILL, H D.,
Hill Mine.
PO—Providence, Ky.; SP—Same, CTY—Webster.
No report.

HILLSIDE COAL CO.
Hillside and Oakland Mines.
PO—Hillside, Ky.; SP—Same; CTY—Muhlenberg; RR—I. C.
PR—J. W. Lam. ....Hillside, Ky.
MS—Andrew Hogg, " "
S of H—1 Elec. loco.
S of M—4 Elec. mach.

HIMYAR COAL CORPORATION.
General Office, Lexington, Ky.
Domino Mine; Drift; Haddix or No. 6 Seam; 64 to 84 in. thick.
PO—Domino, Ky.; SP—Same; CTY—Perry; RR—L. & N.; L. & E. br.
PR—Louis Des Cognets...Lexington, Ky.
TR—L. C. Derrickson, " "
GM—W. L. Carter........Domino, Ky.
PA—W. L. Carter, " "
GS—W. L. Carter, " "
EM—W. L. Carter, " "
EE—W. L. Carter, " "
MS—Edward Burriss, " "
SM—Ben Hardin, " "

S of H—Mules and 1 elec. loco. Track gauge 42 in.
S of M—5 elec. mach.
PP 1 return tubular boiler, total 150 1 gen. unit, 250 volts D. C., and 2 pumps.
EMP—150. Last fiscal year output 90,000 tons.

HOLT COAL CO. (THE)
Holt Mine; Shaft; No. 9; 5 to 6 ft. thick.
PO—Central City, Ky.; SP—Cleaton, Ky.; CTY—Muhlenberg; RR—L. & N., O. & N. Div.
PR—W. F. Holt......Philipsburg, Pa.
VP—B B. Holt......Central City, Ky.
TR—E. W. Holt, " "
GS—E. W. Holt, " "
Secy—N. A. Holt, " "
SM—B. B. Holt, " "
S of H—Mules.
S of M—15 Comp. air mach.
PP—4 return tubular boilers total 500 H. P., 2 air comp. and 1 pump.

HOUSTON & PFOFF
Imperial Mine; Drift; Jellico Seam; 30 to 38 in. thick.
PO—Rockhold, Ky.; SP—Same; CTY—Whitley; RR—L. & N.
PR—John F. Pfoff.......Rockhold, Ky.
GM—John F. Pfoff, " "
TR—Ed Houston, " "
GS—John Pfoff, " "
PA—Ed. Houston, " "
MS—I. B. Pfoff " "
SCO—Address the Company. Buyer, Ed. Houston, Rockhold, Ky.
S of H Mules. Track gauge 36 in.
S of M—1 Elec., 7 comp. air mach.
PP -1 return tubular boiler, total 150 H. P., gen. unit, 250 volts D. C., 1 comp., 1 pump.
EMP—60. Last fiscal year output, 30,000 tons.

HUFFMAN, T. N.
Cloe Creek Mine, Drift, Seam 46 to 52 in. thick.
PO—Pikeville, Ky.; SP—Same; CTY—Pike; RR—C. & O.
GM—F. N. Huffman....Pikeville, Ky.
EM—W. T. Griffith, " "
S of H—Mules; track gauge 40 in.
S of M—Hand.
EMP—9.

INDEPENDENT COAL COMPANY.
Thomas Mine; Drift; 48 in. thick.
PO—Morgantown, Ky.; SP—Beaver Dam, Ky.; CTY—Butler; RR—Green River.
PR—James F. Hope....Morgantown, Ky.
TR—Jas. W. Cook, " "
GS—James W. Cook, " "
PA—Jas. W. Cook, " "
GM—Jas. W. Cook, " "
S of H—Mules.
S of M—Hand.

INDIAN CREEK COAL CO.
Indian Creek Mine; Drift; No. 3 Seam, 34 to 44 in. thick.
PO—Indian Head, Ky.; SP—Same; (Prepay); CTY—McCreary;; RR—C. N. O. & T. P., Main Line.
PR—J. S. Cooper.......Somerset, Ky.
TR—J. C. Walker...Indian Head, Ky.
GM—J. C. Walker, " "
PA—W. I. Strunk, " "
EM—J. M. Ramsey....Indian Head, Ky.
EE—George W. Ramsey, " "
MS J. M. Ramsey, " "
S of H—2 Elec. loco., track gauge 36 in.
S of M—4 Elec. mach.
PP—1 return tubular boiler, 150 H. P., 1 gen. unit, 250 volts D. C., 1 pump.
EMP—85. Last fiscal year output 46,682.5 tons. Sales Agency, J. C. Walker, Indian Head, Ky.

JACKETT COAL CO.
Sturgill Mine; Seam 48 in. thick.
PO Princess, Ky.; SP—Same; CTY—Boyd; RR—C. & O., A. C. & I.
PR—T. L. Jackett.......Princess, Ky.
TR—Ed. Jckett " "
GM—John Jackett " "

JACKSON COAL MINING COMPANY
General Office, Knoxville, Tenn.
Drift Mine.
PO—Artemus, Ky.; CTY—Knox; RR—Cumberland.
PR A. B. Day.......Knoxville, Tenn.
TR—D. H. Jenkins " "
MS—W. B. Kinder.......Artemus, Ky.
SM—L. M. Lyons " "
S of H—Mules.
S of M—Elec. mach.
PP—1 return tubular boiler, 1 gen. unit.
Note—Formerly Dean Coal Co.

JELLICO COAL MINING CO.
General Office, Knoxville, Tenn.
Mt. Ash Mine; Drift; Jellico Seam; 30 to 40 in. thick.
PO—Mt. Ash, Ky.; SP—Same; CTY—Whitley; RR—L. & N.
PR—Arthur Groves....Knoxville, Tenn.
TR—W. J. Everett, " "
GM—E. B. Taylor......Mt. Ash, Ky.
PA—H. H. McCutcheon, " "
GS—E. B. Taylor, " "
MS—H. E. Taylor, " "
MM—J. W. Campbell, " "
EE—J. W. Campbell, " "
EM—Louis M. Madden,.....Harlan, Ky.
SCO—Jellico Coal Mng. Co. Store. Buyer, H. H. McCutcheon, Mt. Ash, Ky.
S of H—5 Elec. loco. and mules; track gauge, 40 in.
S of M—2 Elec. and 20 comp. air machs.
PP—3 Erie City, 1 Jeffrey return tubular boilers, total 600 H. P., 2 gen. units, 250 volts D. C., 1 compressor, 4 pumps.
EMP—256. Last fiscal year output 138,000 tons.

JENKINS COAL CO.
Slope Mine, No. 9 Seam.
PO—Clay, Ky.; SP—Same; CTY—Webster; RR—L. & N.
GM—J. T. Stinman........Clay, Ky.
PA—N. O. Hunt..........Dixon, Ky
S of H—Mules.
S of M—Hand.
EMP—15.
Note—Not operating at present.

JIMTOWN COAL CO.
Point Pleasant, Ky. No report.

KENMONT COAL COMPANY
General Office, Zanesville, O.
Drift Mine; No 7 Seam; 55 to 62 in. thick.
PO—Jeff., Ky.; SP.—Hamlin, Ky, Ky. CTY—Perry; RR—L. & N.
PR—C. A. Case, Zanesville, O.
PA—C. A. Case, Zanesville, O.
TR—L. K. Brown, Zanesville, O.
EM—JJ B. Allen, Hazard, Ky.
S of H—1 elec. loco. Track gauge 42 in.
S of M—2 Elec. Machs.
PP—Purchase power.

KENTUCKY BLOCK CANNEL COAL CO.
No. 2 Mine; Drift; No. 2 Seam; 18 to 26 in. thick.
PO—Cannel City, Ky.; SP—Same; CTY—Morgan; RR—O. & K.
PR—L. P. Yandell,
2 Rector St., New York, N. Y.
TR—S. M. Freese......Cannel City, Ky.
GM—M. L. Conley....Cannel City, Ky.
PA—M. L. Conley, " "
MM—W. Collins, " "
MS—E. Rice........Cannel City, Ky.
SCO—Kentucky Block Coal Co. Store. Buyer, J. F. Reid, Cannel City, Ky.
S of H—1 Steam loco. and mules; track gauge 42 in.
S of M—24 Comp. air mach.
PP—3 return tubular Erie boilers, total 300 H. P., 2 air comp. and 5 pumps.
EMP—180. Last fiscal year output 54,000 tons. Sales agent, T. R. Morgan, Lexington, Ky.

KENTUCKY BLOCK COAL CO.
General Office, Typo, Ky.
Hayslen Mine; Drift; No. 6 Seam; 60 to 72 in. thick.
PO—Typo, Ky.; SP—Hayslen, via Typo, Ky.; CTY—Perry; RR—L. & N.
PR—H. E. Bullock,.......Hazard, Ky.
GM—J. B. Allen, " "
EM—J. B. Allen, " "
SEC—E. J. Gough..........Typo, Ky.
SM—E. J. Gough, " "
GS—John Hayslett, " "
MS—John Hayslett, " "
S of H—1 elec. loco.
S of M—2 elec. mach.
PP—1—100K. W. Syn. Motor Gen. Set, 250-275 volts A. C., 3 phase, 60 cycle, 1 pump. Purchase power.
EMP—70. Two months output 7200 tons.

KENTUCKY COAL & IRON CO.
General Office, Chattanooga, Tenn.
Wiborg Mine; Slope and Drift; No. 3 Seam; 30 to 36 in. thick.
PO -Wiborg, Ky.; SP Same; CTY -McCreery; RR—C. N., O. & T. P.
PR—John F. Walter......Wiborg, Ky.
CM—H. E. Thurman, " "
GS—J. T. Spradlin, " "
EM—A. P. Hodges, " "
EE—N. A. Terry, " "
PA—S. M. Chambliss, " "
MM—David Jones, " "
SM—H. E. Thurman, " "
TR—Lee Cooper, Chattanooga, Tenn.
CE—E. M. Jones, " "
S of H—Mules.
S of M—2 Sullivan machines.
PP—1 boiler, 150 H. P., 2 pumps, purchase power.
EMP—210. Last fiscal year output 44,000 tons.

KENTUCKY FIRE BRICK CO., (THE)
Kentucky Fire Brick Mine, Drift, Fire clay only, no coal.
PO—Haldeman, Ky., SP—Same, CTY—Rowan; RR—C.&O., Lexington Div.
PR—J. R. Hammond......Bolivar, Pa.
TR—R. Becker..........Portsmouth, O.
Secy—R. Becker, " "
VP—L. P. Haldeman, " "
PA—L. P. Haldeman, " "
GM—H. K. Leighow, . Haldeman, Ky.
GS—B. B. Barracks, " "
SM—D. Leadbetter, " "
S of H—Mules.
S of M—Hand machines.
PP—Power furnished from Brick Plant.
EMP—30. Last fiscal year output 35,000 tons.

KENTUCKY GEM COAL CO.
Kentucky Gem Mine, Drift, No. 7 and 8 Seams; 4 to 6 ft. thick.
PO -Rush, Ky.; SP—Norton Branch, Ky.; CTY—Boyd; RR—A. C. I., and C. & O.
PR—J. C. Hatcher..........Rush, Ky.
GS—J. C. Hatcher, " "
TR—J. M. Hatcher, " "
PA—W. R. Stewart, " "
EM—J. L. Simpson, " "
SM—W. R. Stewart " "
MS—P. M. Shawhan, " "
MM—C. A. Montgomery, " "
GM—F. L. Stewart........Louisa, Ky.
S of H—Mules, track gauge 44 in.
S of M—Hand.
EMP—50. Last fiscal year output 24,000 tons.

KENTUCKY JEWEL COAL CO.
Kentucky Jewel Nos. 1, 2 and 4 Mines; Drift; Nos. 4 and 7 Seam 36 to 60 in. thick.
PO—Hazard, Ky.; SP—Lothair, Ky.; CTY Perry; RR—L. & N.
PR—H. E. Bullock.......Hazard, Ky.
GM—H. E. Bullock, " "
TR—Chas. Bischoff........Hazard, Ky.
PA—F. F. McConnell......Lothair, Ky.
MS—Wm. Hazslett, " "
EM Adkins & Denham.....Hazard, Ky.
S of H 4 elec. locos. and gravity. Track gauge 42 in.
S of M—5 Elec. mach.
PP—2 Water tube, Houston, Stanwood & Gamble boilers, total 300 H. P.,2 gen. units, 2300 volts, A. C., 3 phase, 60 cycles, 250 volts D. C.
EMP—125. Last fiscal year output 102,000 tons.
52,000 tons.
Sales Agency, Kentucky Jewel Coal Co., Des Moines, Ia., Hazard, Ky.

KENTUCKY MIDLAND COAL CO.
General Office, Central City, Ky.
Midland Mine, Shaft, No. 9 Seam 4 ft. 6 in. to 5 ft. 2 in. thick
PO—Midland, Ky.; SP—Same; CTY—Muhlenberg; RR—Kentucky Midland Br. Ill. Cent.
PR—E. J. C. Bealer..Cedar Rapids, Ia.
TR—Glenn M. Averill, " "
GM—M. M. Wheeler..Central City, Ky.
PA—M. M. Wheeler, " "
MS—S. R. Hughes........Midland, Ky.
SM—C. L. Nichols, " "
EE—J. A. Hess, " "
S of H—Mules and 1 gasoline loco. Track gauge 40 in.
S of M—9 Elec. machines.
PP—2 Brownell return tubular boilers total 300 H. P., 1 gen. unit, 250 volts, D. C., 1 pump.
EMP—165. Last fiscal year output 70,668 tons.
Sales Agent, M. M. Wheeler, Central City, Ky.

KENTUCKY PORTLAND CEMENT COAL CO.
PO—Pine Hill, Ky.; SP—Same; CTY—Rockcastle.
No report.

KENTUCKY-TENNESSEE COAL CO.
General Office, Chattanooga, Tenn.
One Mine inKentucky, 1 Mine in Tennessee.
Mammoth Mine; Drift; Blue Gem Seam, 23 to 30 in. thick.
PO—Gatliff, Ky.; SP—Same; CTY—Whitley; RR—L. & N.
PR—J. R. Barnes..Chattanooga, Tenn.
TR—H. B. Bonmey, " "
GM—Sol L. Smith..Williamsburg, Ky.
PA—Sol L. Smith, " "
GS Sol L. Smith, " "
MS—T. H. Rodgers......Gatliff, Ky.
EM—A. Stott, " "
S of H—Mules; track gauge 36 in.
S of M—Hand.
EMP—60. Last fiscal year output, 21,000 tons.
Successors to the Mammoth Blue Gem Coal Co.

KEWANEE COAL MINING CO.
Kewanee Mine; Drift; Up. Elkhorn Seam, 48 to 52 in. thick.
PO—Kewanee, Ky.; SP—Same; (Prepay) CTY—Pike; RR—C. & O., Big Sandy Div.
PR—O. P. Chatfield....Pikeville, Ky.
TR—J. B. Rogers, " "
GM—J. B. Rogers, " "
PA—J. B. Rogers, " "
EM—Stoney Amick, " "
GS—Mont Williamson.....Kewanee, Ky.
SCO Kewanee Coal Mining Company Store. Buyer, Rush Sword, Kewanee, Ky.
S of H—1 elec. loco.
S of M—1 elec. mach.
PP—1 Union Iron Works return tubular boiler, 154 H. P., 1 gen. unit, 240 H. P., 250 volts A. C.
EMP—35. Last fiscal year output 40,000 tons.

KEYSER COAL CO.
Keyser Mine; Drift; Elkhorn Seam; 58 to 69 in. thick.
PO—Mossy Bottom, Ky.; SP—Keyser, Ky.; CTY—Pike; RR—C. & O., Big Sandy Division.
PR—Chas. M. Keyser,
Mossy Bottom, Ky.
TR—Chas. M. Keyser, " " "
GM—Chas. M. Keyser, " " "
GS—J. F. Prindible, " " "
EM—J. F. Prindible, " " "
PA—Chas. M. Keyser, " " "
MS—James Helvey, " " "
EE—John B. Dille, " " "
SCO—Address the Company. Buyer, Chas. M. Keyser, Mossy Bottom, Ky.
S of H—Mules and 1 elec. loco. Track gauge 42 in.
S of M—2 Elec. mach.
PP—2 Erie City boilers, total 300 H.P., 1 gen. unit 250 volts D. C., 2 pumps.
EMP—80. Last fiscal year output 63,500 tons.
Sales Agency, Darby Coal & Coke Co., Cincinnati, O.

KIMBLEY COAL CO.
General Office, Trenton, Ky.
Drift Mine; No. 11 Seam, 7 to 8 ft. thick.
PO—Centertown, Ky.; SP—Kronas, Ky.; CTY—Ohio. RR—L. & N.
PR—S. Y. Trimble..Hopkinsville, Ky.
TR—E. J. Ward..........Trenton, Ky.
GM—W. S. Thomson..Madisonville, Ky.
GS—W. S. Thomson, " "
PA—W. S. Thomson, " "
EM—N. E. Stone, " "
S of H—Mules, track gauge 40 in.
S of M—6 Comp. air machines.
PP—1 Boiler total 150 H. P.; 1 air comp.
EMP—62.
Sales Agent, E. P. Ware, Trenton, Ky.
(Old information.)

KING HARLAN MINING CO.
King Harlan No. 1 Mine; Drift; Harlan Seam; 50 to 60 in. thick.
PO—Kilday, Ky.; SP—Same; CTY—Harlan; RR—L. & N.
PR—Tyler Calhoun, ...Nashville, Tenn.
TR—Paul M. Davis " "
GM—A. H. Wood,..........Kilday, Ky.
PA—A. H. Wood " "
CE—A. H. Wood " "
EM—A. H. Wood " "
GS—W. S. Wood " "
MS—J. W. Dean " "
S of H—1 gasoline loco.
S of M—2 elec. mach.
PP—Buy power.
EMP—100.
Note—Started operation March, 1916.

KINGTON COAL CO.
Nos. 1 and 2 Mines; Drifts, No. 9 Seam; 54 to 60 in. thick.
PO—Morton's Gap, Ky.—SP—Morton, Ky—CTY—Hopkins; RR—L. & N. Kington Switch.
PR—W. W. Kington..Morton's Gap, Ky.
TR—W. W. Kington, " "
GM—W. W. Kington. Morton's Gap, Ky.
PA—O. J. Oates, " "
GS—O. M. Kington, " "
CE—O. M. Kington, " "
MS—Chas. Wilson, " "
MM—J. W. Hayes, " "
EE—J. W. Hayes, " "
SM—O. J. Oates, " "
EM—N. E. Stone....Madisonville, Ky
S of H—Mules and 2 elec. loco. Track gauge 44 ins.
S of M—Comp. air mach.
PP—3 boilers, total. 450 H. P., gen. unit 250 volts D. C.
EMP—325. Last fiscal year output 150,000 tons

KIRK COAL COMPANY
General Office, Beech Creek, Ky
Kirk Mine; Drift; No. 9 Seam; 66 to 71 in. thick.
PO—Beech Creek, Ky.; SP—Kirk Mine, Ky.; CTY Muhlenberg; RR -L. & N., Beech Creek br.
PR—L. Z. Kirkpatrick...Greenville, Ky.
TR—C. Kirkpatrick....Beech Creek, Ky.
PA—C. Kirkpatrick, " "
MS—W. L. Russell, " "
EE—H. Westerfield, " "
GM—H. L. Kirkpatrick, Russellville, Ky.
CE—W A. McDonald..Central City, Ky.
EM—W. A. McDonald, " "
S of H—Mules and 1 elec. loco.
S of M—3 elec. mach.
PP -1 pump. Purchase power.
EMP—65. Last fiscal year output, 48,360 tons.

KRYPTON COAL COMPANY.
No. 4 Bluejim Seam; 38 in. thick.
PO—Glenn, Ky. SP—Krypton; CTY—Perry RR—L. & N. & L. & E.
PR—J. C. Baker........Glenn, Ky.
PA—J. C. Baker " "
TR—R. B. Mosley, " "
GM—J. A. Collins, " "
MS O. B. Caff, " "
Output 800 tons.
Note—Just commencing operation.

LAM COAL COMPANY
General Office, Bevier, Ky.
Lam Mine; Drift; West Kentucky No. 9 Seam.
PO—Bevier, Ky.; SP—Same; CTY—Muhlenberg; RR—L. & N.
PR—J. C. Saunders.....Premier, W. Va.
TR—W. L Hughes.....Central City, Ky.
GM—W. L. Hughes, " "
PA—W. L. Hughes, " "
EM—Geo. Wales, " "
MS—M. L. Goodson........Bevier, Ky.
MM—C. H. Maddox, " "
EE—C. H. Maddox, " "
S of H—Rope and 2 elec. locos.
S of M—7 elec. mach.
PP—3 return tubular boilers, total 360 H. P., 1 gen. unit, 250 volts D. C.
EMP—200. Daily output 1,000 tons.

LAM-WOODBURN COAL CO.
Out of business.

LAMB COAL COMPANY.
Out of business.

LEE COAL CO., (THE)
Lee No. 1, Drift, No. 2 Cannel Coal, 38 to 49 in. thick.
PO—Clearfield, Ky., SP—Redwine, Ky., CTY—Rowan; RR—Morehead and North Fork.
PR—A. W. Lee........Clearfield, Pa.
TR—John W. Wrigley, " "
GM—Guy Snyder........Clearfield, Ky.
GS—Guy Snyder, " "
PA—Guy Snyder, " "
MS—J. H. Adkins........Loveland, Ky.
SCO—Clearfield Supply Co., Buyer, H. M. Turner, Clearfield, "
S of H—Mules; track gauge 36 in.
S of M—Hand.
EMP—50. Last fiscal year output 8,208.91 tons.

LEEPER COAL COMPANY.
Slope; No. 9 Seam; 4 ft. 8 in. to 5 ft. thick.
PO—Providence, Ky.; SP—Same; CTY—Webster. RR—Ill. Central.
PR—T. J. Montgomery..Providence, Ky.
GM—T. J. Montgomery, " "
PA—T. J. Montgomery, " "
TR—J. E. Leeper, " "
MS—Bob Wanless, " "
EM—Thos. O. Long, " "
S of H—Mules.
S of M—Hand.
PP—1 Water tube boiler, Chandler & Taylor total 80 H. P.; 1 pump.
EMP—30. Last fiscal year output 31,755 tons. Sales agent, Southern Coal Co., Memphis, Tenn.

LICK BRANCH COAL CO.
Coxton and Kayu Mines; Drifts; Harlan Seams; 42 to 60 in. thick.
PO—Coxton, Ky; SP—Same; CTY—Harlan RR—L. & N., K. & V. br.
PR—J. W. Williams.......Coxton, Ky.
GM—J. W. Williams, " "
TR—Dover Williams, " "
GS—Dover Williams, " "
PA—Dover Williams, " "
MM—Geo. Neikirk, " "
EM—Pail Francis, " "
EE—Jack Mullins, " "
SCO—Address the Company. Buyer T. C. Eaton, Coxton, Ky.
S of H—5 elec. loco. Track gauge 42 in.
S of M—10 elec. mach.
PP—Power purchased.
EMP—325. Last fiscal year output 227,043.24 tons.

LOG MOUNTAIN COAL CO.
General Office, Harrison, Ky.
PR—S. G. Seligmont....Tamaqua, Pa.
TR—Rucherfoard Fleet, Richmond, Va.
GM—Abner Lunsford.....Harrison, Ky.
GS—G. D. Tinley , " "
PA—E. J. Sewell, " "
SCO—Address the Company, " "
EM—Culton & Bailey....Pineville, Ky.

No. 1 Mine; Drift; Mason Seam, 48 to 54 in. thick.
PO—Davisburg, Ky.; SP—Cairnes, Ky.; CTY—Bell; RR—L. & N.
MS—G. D. Tinley......Harrison, Ky.
S of H—1 Elec. loco.; track gauge, 44 in.
S of M—3 Elec. mach.
PP—1 Return tubular boiler, 225 H. P., 2 gen. units, 225 volts D. C., 1 pump.
EMP—125. Last fiscal year output, 75,890 tons.

No. 52 Mine; Drift; Popular Lick Seam, 40 to 48 in. thick.
PO—Harrison, Ky.; SP—Same; CTY—Bell; RR—L. & N.
S of H—2 Elec. loco. and mules.
S of M—Hand.
PP—2 Return tubular boilers, total 250 H. P., 1 gen. unit, 250 volts D. C., 1 pump.
EMP—121. Last fiscal year output, 72,100 tons.
Nos. 53 and 54 Mines; Drift; Poplar Lick Seam, 40 to 48 in. thick.
PO—Davisburg, Ky.; SP—Same; CTY—Bell; RR—L. & N.
NOTE—Temporary closed.

LOONY CREEK COAL CO.
Loony Creek Mine; Drift; C Seam; 60 to 72 in. thick.
PO—Pee Vee, Ky.; SP—Clutts, Ky.; CTY—Harlan; RR—L. & N. K. & V. Div.
PR—P. V. Cole..........Pee Vee, Ky.
VP—Robert W. Cole, " "
GS—Perry V. Cole, " "
GM—Perry V. Cole, " "
TR—Chas. D. Cole, " "
PA—Chas. D. Cole, " "
MS—Rosco Hale, " "
EM—Thomas Miller, " "
EE—T. K. Johnstone, " "
SM—W. T. Pope, " "
S of H—Mules and 1—5-ton Goodman Locomotive.
S of M—3 elec. mach.
PP—2 boilers, total 300 H. P., Westinghouse-Harrisburg gen. unit, 250 volts D. C., 100 K. W., 1 pump.
EMP—115. Last fiscal year output 63,000 tons.

LOW ASH MINING CO.
Shaft Mine Excelsior Seam, 44 in. thick.
PO—Meldrum, Ky.; SP—Excelsior, Ky.; CTY—Bell; RR—L. & N.
PR—E. P. Nicholson, Middlesboro, Ky.
GM—F. D. Hart, Jr., " "
EE—F. D. Hart, Jr., " "
TR—F. D. Hart, Jr., " "
PA—F. D. Hart, Jr., " "
GS—J. D. Simpson, ...Meldrum, Ky.
EM—J. C. Richardson..Middlesboro, Ky.
SCO—Address the Company. Buyer, Thos. Yarber, Middlesboro, Ky.
S of H—Mules and rope.
S of M—2 Elec. mach.
PP—1 water tube boiler, total 150 H. P., 230 volts A. C., 3 phase, 60 cycles, 1 pump. power purchased.

LOWER HIGNITE COAL MINING CO.
Drift Mine; Lower Hignite Seam; 42 to 54 in. thick.
PO—Middlesboro, Ky.; SP—Murtea, Ky.; CTY—Bell; RR—L. & N., Stony Fork branch.
PR—A. H. Rennebaum..Middlesboro, Ky.
TR—W. E. Gunn......Middlesboro, Ky.
S of H—Mules. Track gauge 42 in.

McCREARY COUNTY COAL CO.
Barthell, Ky. No report.

McHENRY COAL CO.
General Office, Central City, Ky.
PR—T. C. Du Pont....Wilmington, Del.
TR—L. L. Dunham, New York City, N.Y.
VP—S. J. Gish......Central City, Ky.
GM—S. J. Gish, " "
EM—B. E. Hess, " "
Sales Agent, J. H. Small, Central City, Ky.

Render Mine; Slope; No. 9 Seam; 54 to 60 in. thick.
PO—McHenry, Ky.; SP—Same; CTY—Ohio; RR—Ill. Cent.
MS—L. L. Stewart......McHenry, Ky.
SM—L. L. Stewart, " "
S of H—1 Elec. loco.; track gauge, 42 in.
S of M—7 Elec. mach.
PP—3 Return tubular boilers, total 400 H. P., 1 gen. units, 250 volts D. C., 1 pump.
EMP—135. Last fiscal year output 7,968 tons.

Echols Mine; Shaft; No. 9 Seam; 54 to 60 in. thick.
PO—Echols, Ky.; SP—Same; CTY—Ohio; RR—Ill. Cent.
MS—J. L. Jenkins........Echols, Ky.
SM—A. T. Baker, " "
S of H—1 Elec. loco.; track gauge, 40 in.
S of M—4 Elec. mach. and hand.
PP—2 Return tubular boilers, total 300 H. P., 1 gen. unit, 250 volts D. C., 1 pump.
EMP—138. Last fiscal year output 8,808 tons.

J. R. McNEIL
Jewel Mine; Drift.
PO—Pittsburg, Ky.; SP—East Bernstadt; CTY—Laurel; RR—L. & N.
GM—J. R. McNeil......Pittsburg, Ky.
Note—Successors to McNeil Brothers.

MAGNET COAL CO.
Drift Mines; Dean Seam, 5 ft. 2 in. thick.
PO—Deanton, Ky.; SP—Hosman, Ky.; CTY—Bell; RR—L. & N.
PR—J. C. Hoskins........Deanton, Ky.
GM—J. C. Hoskins, " "
MS—J. C. Hoskins, " "
TR—John Morgan, " "
PA—Drexel Morgan, " "
MM—John Hoskins, " "
EE—John Hoskins, " "
EM—Cultom & Bailey....Pineville, Ky.
SCO—Magnet Commissary Store, Buyer, Drexel Morgan, Deanton, Ky.
S of H—1 elec. loco.; track gauge 40 in.
S of M—4 Elec. mach.
PP—1 water tube boiler, 150 H. P., 1 gen. unit, 150 volts D. C.
EMP—102. Last fiscal year output 70,500 tons.
Sales Agency, Bewley Darst Coal Co., Knoxville, Tenn.

MAHAN JELLICO COAL CO.
Drift Mine, Jellico Seam, 34 to 48 in. thick.
PO—Packard, Ky.; SP—Same (Prepay); CTY—Whitley; RR—L. & N., Pine Mtn. Branch.
PR—T. B. Mahan, Williamsburg, Ky.
GM—T. B. Mahan, " "
GS—W. M. Mohan.......Packard, Ky.
PA—U. S. Siler, " "
MM—J. M. Hill, " "
EE—J. M. Hill, " "
S of H—2 Elec. loco. and mules; track gauge 36 in.
S of M—1 Elec., 28 comp. air mach.
PP—4 Return tubular boilers, gen. unit 250 volts D. C., 2 compressors.
EMP—280. Last fiscal lear output 149,978.75 tons.

MAIN JELLICO MOUNTAIN COAL CO.
Kensee Mines, Drift, Jellico Seam.
PO—Kensee, Ky.; SP—Jellico; CTY—Whitley; RR—L. & N.
GM—J. H. Barker........Kensee, Ky.
PA—J. H. Barker, " "
MS—John Rudolph, " "
EM—D. C. Barker......Jellico, Tenn.
S of H—Mules.
S of M—Hand.
PP—Boiler, 25 H. P.
EMP—100.

MAJESTIC COLLIERIES CO.
Majestic Mine, Drift, Warfield, Alma and Glen Alum Seams, 4½ to 9 ft. thick.
PO—Majestic, Ky., SP—Cedar, W. Va., CTY—Pike. RR—N. & W., Poplar Creek Branch.
PR—W. A. Phillips....Mt Carmel, Pa.
TR—Geo. C. Graeber....Shamokin, Pa.
Mine Mgr—H. G. Van Hoose, Majestic, Ky.
PA—T. R. Joseph, " "
MS—Geo. Foster, " "
MM—L. G. Seale.......Majestic, Ky.
EE—L. G. Seale, " "
EM—Meem & Haskins..Bluefield, W.Va.
SM—W. T. Wingfield....Majestic, Ky.
S of H—Mules, 5 elec. locos. Track gauge 56 in.
S of M—Elec. machines.
PP—2 Water tube and 2 return tubular boilers, total 600 H. P., 2 gen. units 2200 volts A. C.
EMP—250. Last fiscal year output 165,000 tons. Sales Agency, Castner, Curran & Bullitt, Phila., Pa.

MARROWBONE COKE CO.
Now Marrowbone Mining Co.

MARROWBONE MINING CO.
Marrowbone Nos. 1 and 2 Mines; Drifts; Lower and Upper Elkhorn Seam, 42 to 48 in. thick.
PO—Lookout, Ky., SP—Rockhouse, Ky., CTY—Pike. RR—C. & O., Marrowbone and Big Sandy Div.
PR—F. R. Rhodes.......Cincinnati, O.
TR—F. R. Rhodes, " "
GM—J. C. Layne, Jr. " "
GS—J. J. Christie........Lookout, Ky.
PA—J. J. Christie, " "
MS—J. J. Christie, " "
EM—Edward Holly.......Pikeville, Ky.
SCO—Rockhouse Supply Co., Buyer, J. J. Christie, Lookout, Ky.
S of H—Mules and 1 elec. loco.; track gauge 44 in.
S of M—3 elec. mach.
PP—2 Brownell return tubular boilers, total 300 H. P., 1 gen. unit, 250 volts D. C., 1 pump.
EMP—75.
32 Bee Hive coke ovens. Last fiscal year output 60,000 tons. Sales agency, Eaton, Rhodes & Co., Cincinnati, O.

MARTIN & POLLOCK COAL CO.
Martin Mine, Drift; "No. 9" Seam, 4½ ft. thick.
PO—Cromwell Ky.; CTY—Ohio; RR—Green River.
PR—A. R. Pollock........Island, Ky.
TR—H. B. Martin......Cromwell, Ky.
S of H—Mules; track gauge 36 in.
S of M—Hand.

MASTERS COAL COMPANY.
Star and Standard No. 2 Mine; 36 in. thick.
PO—East Bernstadt, Ky.; SP—Same CTY—Laurel; RR—L. & N., K. C. A. M.
PR—Tom Mosters, East Bernstadt, Ky.
GM—Tom Masters, " "
S of H—Mules and Rope.
S of M—Hand.
PP—1 Gen. unit, 2 pumps.
EMP—40. Last fiscal year output, 8,000 tons.

MEMPHIS COAL CO.
Slope Mine; No. 9, Kentucky Seam; 52 to 60 in. thick.
PO—Island, Ky.; SP—Same; CTY—McLean RR—L. & N.
TRUSTEE—R. D. Rose, Hinton, W. Va.
PA—R. D Rose, Hinton, W. Va
S of H—Elec. Loco.

MERCER COAL CO.
Doey Mine.
PO—Mercer, Ky.; CTY—Muhlenberg.
No report.

MIDDLE CREEK COAL CO., (THE)
Middle Creek Mine, Drift, No. 1 Seam, 3 to 5 ft. thick.
PO—Prestonburg, Ky., SP—Same, CTY—Floyd; RR—Big Sandy Div. C. & O.
PR—Hiram Harris....Prestonburg, Ky.
TR—Geo. B. Archer, " "
GM—Walter S. Wells, " "
MS—J. Lee Salmons, " "
PA—J. Lee Salmons, " "
EE—H. L. Wells, .. Prestonburg, Ky.
EM—Ed. Halley........Pikeville, Ky.
SCO—Wells & Craft...Prestonburg, Ky.
S of H—Mules and 1 elec. loco., track gauge 42 in.
S of M—8 Elec. machines.
PP—1 Union Iron Works water tube boiler, 150 H. P., 1 gen. unit 250 volts D. C.
EMP—130. Last fical year output 65,000 tons. Sales Agent, David Halley Ironton, Ohio.

MONARCH COAL & COKE CO.
Monarch Mine; Drift; Lower Higuite Seam, 47 to 55 in. thick.
PO—Middlesboro, Ky., SP—Wilmont, Ky., CTY—Bell. RR—L. & N. and Sou., Stony Fork Branch.
PR—Daniel Cooper Swab, Hartranft, Tenn
TR—M. S. Hollingsworth, Middlesboro, Ky.
GM—Wm. Costello, " "
PA—Wm. Costello, " "
GS—J. L. Drake, " "
EM—J. C. Richardson, " "
EE—Walker Jackson, " "
SM—J. H. Brown......Shamrock, Ky.
S of H—Mules, and 2 elec. loco., track gauge 44 in.
S of M—2 Elec. short wall machines.
PP—1 Erie waer tube boiler, 100 H. P. and 3 pumps.
EMP—100 . Last fiscal year output 62,000 tons.
Sales agency, Monarch Coal & Coke Co.

MORGANFIELD COAL & MINING CO.
Morganfield Mine, Shaft, No. 11 Seam, 58 in. thick.
PO—Morganfield, Ky., SP—Same, CTY—Union. RR—I. C., Uniontown Br.
PR—W. H. Lloyd....Morganfield, Ky.
GM—W. H. Lloyd, " "
PA—W. H. Lloyd. " "
SM—W. H. Lloyd.....Morganfield, Ky.
GS—Henry Lloyd, " "
MS—Henry Lloyd, " "
S of H—Mules; track gauge 42 in.
S of M—Hand.
PP—4 return tubular boilers, total 410 H. P., 2 pump.
EMP—235. Last fiscal year output 10,243 tons.
Sales Agent, W. H. Lloyd.

MOSS COAL COMPANY, THE
General Office, Middlesboro, Ky.
Barner Mine; Shaft; Barner Seam, 36 to 40 in. thick.
PO—Meldrum, Ky.; SP—Same; CTY—Bell. RR—L. & N.
PR—Ray Moss.......Middlesboro, Ky.
GM—Ray Moss, " "
TR—Dr. J. G. Moss...Knoxville, Tenn.
MS—R. C. Bargo........Meldrum, Ky.
PA—W. M. Capers.......Meldrum, Ky.
CE—C. R. Conner..Huntington, W. Va.
EM—C. P Davidson..Middlesboro, Ky.
SCO—The Moss Coal Company Store. Buyer, W. M. Capers, Meldrum, Ky.
S of H—Mules and rope. Track gauge 42 in.
S of M—Hand.
PP—1 W. W. water tube boiler, 50 H. P., 4 gen. units, and 1 pump.
Last fiscal year output 50,000 tons.

MOSS & SONS COAL CO.
Out of business.

MOUNTAIN LAKE COAL COMPANY.
Mountain Lake Mine, Drift, Turner Seam, 4 to 5 ft. thick.
PO—Middlesboro, Ky.; SP—Same; CTY—Bell; RR— L. & N.
PR—J. S. Victor......Middlesboro, Ky.
TR—F. W. Victor, " "
GS—J. S. Victor, " "
GM—J. S. Victor, " "
PA—J. S. Victor, " "
SCO—Mountain Lake Coal Co. Store. Buyer, P. M. McKart, Middlesboro, Ky.
S of H—Mules and Incline; track gauge 44 in.
S of M—Hand.
EMP—50. Last fiscal year output 27,700 tons.

NEBO COAL COMPANY.
Nebo No. 1 Mine, Slope; No. 14 Seam; 5 ft. 9 in. to 7 ft. thick.
PO—Nebo, Ky.; SP—Same; CTY—Hopkins. RR—L. &N.
PR—M. S. Barker......Louisville, Ky.
TR—B. Strauss, " "
GS—Jno. B. Robinson.......Nebo, Ky.
PA—Jno. B. Robinson, " "
EM—Jno. B. Robinson, " "
MS—Chas. P. Wallace, " "
MM—W. A. Bates, " "

EE—W. A. Bates, " "
SM—C. O. Wilkie, " "
S of H—Mules and 2 elec. loco.; track gauge 42 in.
S of M—Six elec. mach.
PP—2 Return tubular boilers total 300 H. P., 1 gen. unit, 250 volts, D. C.; 1 pump.
EMP—150. Output 10,000 tons per month.
(Old information.)

NEBO CONS. COAL & COKING CO.
Nebo, Ky. No report.

NELSON CREEK COAL CO.
Nelson Mine, Shaft; No. 9 Seam, 5 ft. thick.
PO—Nelson, Ky., SP—Same, CTY—Muhlenberg. RR—I. C. R. R.
PR—R. S. Lytle........Danville, Ky.
GM—J. W. Bastin........Nelson, Ky.
GS—J. W. Bastin, " "
PA—J W. Bastin, " "
EM—Chas. Lunsford........Nelson, Ky.
MS—Chas. Lunsford " "
MM—W. F. Wallace, " "
SM—D. L. Young, " "
S of H—Mules; track gauge 36 in.
S of M—30 Comp. air mach.
PP—3 boilers, total 450 H. P., 1 air comp. and 1 pump.
EMP—200. Last fiscal year output 100,000 tons. Sales Agency, Southern Coal Co., Memphis, Tenn.

NEW BELL JELLICO COAL CO.
Nos. 1, 2 and 3 Mines, Drifts, Dean Seam, 6 to 10 ft. thick.
PO—Bell Jellico, Ky., SP—Four Mile, Ky., (coming in) and Blowers, Ky., (going out) CTY—Bell. RR—L. & N., Pine Mountain Br.
PR—T. D. Cassidy.....Lexington, Ky.
TR—T. J. Cassidy, " "
GM—W. McC. Johnston, Bell Jellico, Ky.
PA—W. H. Collier, " "
EM—W. B. Johnston, " "
MM—W. B. Johnston, " "
EE—W. B. Johnston, " "
SCO—New Bell Jellico Coal Co. Store. Buyer W.H. Collier, Bell Jellico, Ky
S of H—Mules; track gauge 38 in.
S of M—15 comp. air machines.
PP—2 return tubular boilers, total 300 H. P., 1 air comp. and 3 pumps.
EMP—200. Last fiscal year output 125,000 tons. Sales Agency, Cassidy Coal Co., Lexington, Ky.
(Old information.)

NEW HUGHES JELLICO COAL CO.
Hugel Mine; Drift; Jellico Seam, 54 to 60 in. thick.
PO—Elys, Ky.: SP—Same; CTY— Knox RR—L. & N., C. V. branch.
PR—A. M. Decker....Barbourville, Ky.
TR—J. S. Miller, " "
GM—R. N. Cornett..........Elys, Ky.
GS—R. N. Cornett, " "
MS—F. F. McCoy, " "
EE—L. C. Carnes, " "
SM—A. M. Decker, Jr. " "
CE—C. P. Davidson, " "
EM—C. P. Davidson, " "
S of H—Elec. loco. and mules.
S of M—Elec.
PP—Water tube boiler, 150 H. P., gen. unit 250 volts D. C., 1 pump.
EMP—80. Last fiscal year output 80,000 tons.

NEW WATTS CREEK JELLICO COAL CO.
Watts Creek Mine; Drift; Jellico Seam; 48 to 60 in. thick.
PO—Wofford, Ky.; SP—Same; CTY—Whitley; RR—L. & N.
PR—John Surgener........Wofford, Ky.
GM—John Surgener, " "
GS—John Surgener, " "
PA—John Surgener, " "
TR—Ishan Smith, " "
SM—Bert Kidel, " "
S of H—Mules. Track gauge 36 in.
S of M—Hand.
EMP—50.
Note—Successors to Watts Creek Jellico Coal Co.

NICHOLSON MINING & MFG. CO.
"Hot Stuff" Mine, Shaft, No. 9 Seam, 48 to 54 in. thick.
PO—Henderson, Ky., SP—Same, CTY—Henderson; RR—L. & N. and I. C.
PR—J L. Nicholson....Henderson, Ky.
TR—Fred Nicholson, " "
GM—Fred Nicholson, " "
PA—J. L. Nicholson, " "
GS—J. L. Nicholson, " "
EM—John Maple, " "
MS—John Maple.......Henderson, Ky.
SCO—Nicholson Store. Buyer, J. L. Nicholson, Henderson, Ky.
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—3 Walton return tubular boilers, total 350 H. P., 4 gen. units, 5 pumps.
EMP—35. Last fiscal year output 25,000 tons. Sales Mgr., Leslie Nicholson.

NORTH EAST COAL CO.
General Office, 1732 Commercial Trust Bldg., Philadelphia, Pa.
PR—A.D.W.Smith, Philadelphia, Pa.
TR—A. D. W. Smith, " "
Secy—Carl B. Metzger, " "
GM—H. La Viers......Paintsville, Ky.
GS—R. C. Thomas,.....Paintsville, Ky.
PA—W. H. Salyer, " "
MM—H. F. Pfening, Jr., " "
EE—H. J. Wheeler, " "
EM—C. C. Henkle, " "
SCO—Thealka Store, Buyer, W. R. Davis, Thealka, Ky.
Sales Agency, Middle West Coal Co., Cincinnati, O.

No. 1 Mine; Drift; No. 1 Seam, 42 in. thick.
PO—Thealka, Ky.; SP—Same; CTY—Johnson; RR—C. & O., Big Sandy Div.
MS—H. Pfening, Sr.,...Paintsville, Ky.
S of H—2 Elec. loco.; track gauge 42 in.
S of M—11 elec. mach.
PP—2 Return tubular boilers, total 300 H.P., 1 gen. unit 250 volts, D.C., 4 pumps.
EMP—112. Last fiscal year output 109,269 tons.

No. 2 Mine; Drift; No. 1 Seam, 42 in. thick.
PO—Thealka, Ky.; SP—Same; CTY—Johnson; RR—C. & O., Big Sandy Div.
MS—C. Childress.........Thealka, Ky.
S of H—2 Elec. loco.; track gauge 42 in.
S of M—7 Elec. mach.
PP—2 Return tubular boilers total 250 H. P., 1 gen. unit 250 volts A. C. 3 pumps.
EMP—66. Last fiscal year output 59,646 tons.

No. 3 Mine; Drift; No. 1 Seam, 40 in. thick
PO—Thealka, Ky.; SP—Same; CTY—Johnson; RR—C. & O., Big Sandy Div.
MS—T. J. Davis ...... Thealka, Ky.
SM—W. J. Davis, " "
S of H—2 Elec. loco.; track gauge 42 in.
S of M—7 Elec. mach.
PP—4 return tubular boilers, total 600 H. P., 2 gen. units, 250 volts D. C., 3 pumps.
EMP—100. Last fiscal year output 78,104 tons.

No. 7 Mine; Drift; No. 1 Seam, 42 in. thick.
PO—Auxier, Ky.; SP—Same; CTY—Floyd; RR—C. & O., Big Sandy Div.
MS—J. B. Childress.......Auxier, Ky.
S of H—4 Elec. loco.; track gauge 42 in.
S of M—15 elec. mach.
PP—4 Return tubular boilers, total 600 H. P., 2 gen. units, 250 volts D. C. 4 pumps.
EMP—152. Last fiscal year output 134,221 tons.

NORTH FORK CANNEL COAL COMPANY.
Out of business.

NORTH JELLICO COAL CO., (THE)
General Office, Louisville, Ky.
PR—W. S. Speed.......Louisville, Ky.
VP—F. M. Sackett, " "
TR—C. D. Major, " "
GM—C. S. Nield.........Wilton, Ky.
PA—L. R. Reams, " "
EE—H. C. Craft, " "
Sales Agent, B. F. Reed, Louisville, Ky.

Wilton and Olive Hill Mines, Drifts, Jellico Seam, 42 to 48 in. thick.
PO—Wilton, Ky. SP—Woodbine, Ky., CTY—Knox; RR—L. & N., Wilton Branch.
MS—A. Frost............Wilton, Ky.
S of H—10 elec. loco. Track gauge 36 in.
S of M—23 elec. mach.
PP—3 Babcock & Wilcox water tube boilers, total 556 H. P., 2 gen. units, 2300 volts A. C., 3-phase 60 cycle, 2 pumps.
pumps.
EMP—600. Last fiscal year output 337,742 tons.
Note—Bertha Mine worked out. Output for last year 78,034 tons.

NORTON COAL MINING CO.
PR—Sterling S. Lanier, Birmingham, Ala.
VP—Monro. B. Lanier, " "
TR—S. S. Lanier, Jr. Nortonville, Ky.
GM S. S. Lanier, Jr., " "
GS—Henry C. Delaney, " "
PA—R. L. Schlotman, " "
EE—W. D. Morton, " "
EM—Geo. Wales......Central City, Ky.
SCO—Nortonville Merc. Co., Buyer, J. R. Harrison, Nortonville, Ky.
Sales Agency, Monro, Warrior, C. & C. Co., Birmingham, Ala.

No. 1 Mine, Shaft, Nos. 9, 11 and 12 Seams, 4 ft. 10 in. to 6 ft. 3 in. thick.
PO—Nortonville, Ky., SP—Same, CTY—Hopkins. RR—I. C. & L. & N.
S of H—Mules and 4 elec. locos. Track gauge 36 in.
S of M—13 Elec. mach.
PP—6 return tubular boilers, total 800 H. P., 2 gen. units 250 volts D. C., 3 pumps.
EMP—300. Last fiscal year output 297,497.09 tons.

No. 2 Mine, Slope, No. 11 Seam, 6 to 7 ft. thick.
PO—Nortonville, Ky., SP—Same, CTY—Hopkins; RR—L. & N.
S of H—Mules; track gauge 42 in.
S of M—3 Elec. mach.
PP—1-100 H. P. boiler, 1 pump. Power furnished from No. 1 Mine.
EMP—30.
Note—Did not operate last year.

OHIO VALLEY COAL & MINING CO.
DeKoven Mine, Slope, No. 9 Seam, 4 ft. 8 in. thick.
PO—DeKoven, Ky. SP—Same. CTY—Union. RR—I. C., Evansville Div.
PR—W. K. Field, .. Pittsburgh, Pa
TR—Wm. Miller, " "
GM—G. W. Schleuderberg, " "
PA—F. E. Now, " "
GS—A. A. Galloway......De Koven, Ky.
MM—F. C. Boettger, " "
EE—Lawrence McGary, " "
SCO—Federal Supply Co. Store No. 133, J. T. McCauley, Mgr. " "
S of H—3 elec. loco. Track gauge 44½ in.
S of M—8 elec. mach.
PP—6 return tubular boilers, total 900 H.P., 300 K.W., 500 volts D. C., 2 pumps.
EMP—300. Coke ovens. 20 Bee Hive. Last fiscal year output 21,542 tons.

O'NEILL COAL CO.
O'Neill Mine, Shaft, No. 9 Seam, 4 ft. 2 in. to 4½ ft. thick
PO—Island, Ky. SP—Same. CTY—McLean. RR—L. & N., O. & N. Branch.
PR—John O'Neill.........Island, Ky.
TR—John Penrod, " "
GM—John O'Neill, " "
GS—John O'Neill, " "
PA—John Penrod, " "
S of H—Mules. Track gauge 36 in.
S of M—Hand.
EMP—30. Last fiscal year output 18,749 tons. Sales Manager, John O'Neill.

OVERSTREET, W. E.
PO—Owensboro, Ky; CTY—Daviess.
No report.

PANAMA COAL CO.
Panama Mine, Shaft, No. 9 Western Kentucky Seam, 58 in. thick.
PO—Robards, Ky. SP—Same. CTY — Henderson. RR—L. & N.
PR—O. W. Rash, ... Robards, Ky.
TR—M. V. Denton, " "
GM—M. V. Denton, " "
GS—M. V. Denton, " "
PA—M. V. Denton, " "
MS—Joe McIntire, " "
CE—C. W. McElroy, Morganfield, "
EM—C. .W McElroy, " "
MM—H. Cross, ... Robards, "
EE—H. Cross ....Robards, Ky.
SCO—Cottingham Bros. " "
Buyer, C. E. Cottingham, " "
S of H—Mules and 1 elec. loco. Track gauge 42 inches
S of M—5 Elec. mach.
PP—3 boilers, total 450 H.P., 250 volts D.C., 1 pump.
EMP—70. Last fiscal year output 32, 187 tons. Sales Agent, M. V. Denton, Robards, Ky.

PEARL, J. N., CO.
Out of business.

PEERLESS COAL CO., (THE)
Out of business.

PEOPLES MINING CO.
Shaft Mine; No. 9 Seam, 48 to 54 in. thick.
PO—Henderson, Ky. SP—Same. CTY—Henderson. RR—I. C., L. & N.
PR—S. L. Marshall......Henderson, Ky.
TR—W. T. Lambert, " "
GM—Ben W. Floyd, " "
PA—Ben. W. Floyd, " "
MS—Ben. W. Floyd, " "
EM—T. E. Davis, " "
S of H—Mules.
S of M—Hand.
PP—Boiler, 80 H. P., and 2 pumps.
EMP—60.

PERKINS COAL CO.
Cooke Mine; Drift; Jellico Seam, 36 to 48 in. thick.
PO—Jellico, Tenn.; SP—Myrlin, Ky.; CTY—Whitley; RR—L. & N.
PR—B. E. Parker....Barboursville, Ky.
TR—C. Perkins......Williamsburg, Ky.
GM—C. Perkins, " "
PA—C. Perkins, " "
EM—N. R. Rodgers......Pineville, Ky.
MS—T. H. Rodgers......Jellico, Tenn.
SCO—Address the Company, " "
S of H—Mules. Track gauge 36 in.
S of M—Hand.
EMP—50. Last fiscal year output 6,500 tons.

PERRY COUNTY BLOCK COAL CO.
PR—R. T. Peters..........Viper, Ky.
TR—R. T. Peters..........Viper, Ky.
SECY—W. E. Price, " "
No report.

PETERSBURG COAL MINING CO.
Drift Mine; No. 6 Seam, 56 to 60 in. thick.
PO—Mannington, Ky.; SP—Same; CTY—Christian; RR—L. & N., Henderson Br.
PR—W. A. Lam........Mannington, Ky.
GM—W. A. Lam, " "
PA—W. A. Lam, " "
CE—W. A. Lam, " "
MS—W. A. Lam, " "
SM—W. A. Lam, " "
TR—J. A. Lam, " "
EM—W. J. Franklin , " "
MM—E. Aldridge, " "
S of H—Mules; track gauge, 42 in.
S of M—Hand.
PP—1 Return tubular boiler, 150 H. P., 1 pump.
Last fiscal year output, 45,000 tons.

PHILLIPS, T. J. COAL CO.
PO—Richardson, Ky.; CTY—Lawrence.
No report.

PINE RIDGE COAL MINING CO.
General Office, Tinsley, Ky.
Drift Mine; Jellico Seam; 54 to 60 in. thick.
PO—Tinsley, Ky.; SP—Italy; CTY—Bell; RR—L. & N., Pine Mountain branch.
PR—E H. Jewett........Detroit, Mich.
TR—L. H. Stone.......Cincinnati, O.
GM—S. L. Washburn......Tinsley, Ky.
GS—S. L. Washburn, " "
PA—S. L. Washburn, " "
S of H—Mules. Track gauge 40 in.
S of M—Hand and 2 comp. air mach.
PP—1 return tubular boiler, total 200 H. P., 1 air compressor, 2 pumps.
EMP—75.
Note—Successors to Greasy Creek Coal Co.

PINNACLE COAL MINING CO., INC.
General Office, Knoxville, Tenn.
Pinnacle Mine; Drift; Poplar Lick Seam; 48 to 96 in. thick. Operate washery.
PO—Ralston, Ky; SP—Stony Fork, Ky.; CTY—Bell; RR—L. & N., Stony Fork Branch.
PR—L. C. Gunter, Knoxville, Tenn.
TR—S. W. Jayne, " "
GM—R. E. Howe,, Shamrock, Ky.
GS—R. E. Howe, Shamrock, Ky.
PA—R. E. Howe, Shamrock, Ky.
MS—Geo. R. Luke, Ralston, Ky.
SM—J. D. Barlow, Ralston, Ky.
EM—J. C. Richardson, Midlesboro, Ky..
S of H—Mules and rope. Track gauge 44 in.
S of M—Hand.
PP—3 Return tubular boilers, total 300 H. P., 2 pumps.
EMP—100. Last fiscal year output 60,000 tons.
Note—Successors to Stony Fork Coal Co.

PIONEER COAL CO.
General Office, Louisville, Ky.
Pioneer Mine, Slope, Straight Creek Seam, 38 to 52 inches thick.
PO—Kettle Island, Ky. SP—Same. CTY—Bell. RR—L. & N.
PR—F. M. Sackett, .. Louisville, Ky.
TR—C. D. Major, " "
GM—C. S. Nield, Kettle Island, "
ASST GM—Grant Mason, " "
PA—Grant Mason, " "
SM—T. B. Hail, " "
MM—G. Craft, " "
EE—Wm. Brock, " "
S of —3 elec. locos. Track gauge 42 in.
S of M—7 elec. machines.
PP—4 Babcock-Wilcox water tube boilers, total 528 H. P., 3 gen. units, 75 volts A. C., 3 phase, 60 cycles and 295 volts D. C., 2 pumps
EMP—300. Last fiscal year output 200 000 tons. Sales Agent, B. F. Reed, Louisville, Ky.

PITTSBURGH COAL CO.
General Office, ... Baskett, Ky.
PR—Alexander Blair, Henderson, "
GM—Alexander Blair, " "
GS—Alexander Blair, Jr., Baskett, "
PA—Alexander Blair, Jr., " "
SCO—Pittsburgh Coal Co.
Store Buyer, Thomas Connolly, Baskett, Ky.

Baskett Mine, Shaft, No. 9 Seam, 4 ft. thick.
PO—Baskett, Ky. SP—Same. CTY — Henderson. RR—L. H. & St. L.
S of H—Mules. Track gauge 36 in.
S of M—8 comp. air machines.
PP—2 Walton return tubular boilers, total 250 H. P., 1 air comp. and 1 pump.
EMP—125. Last fiscal year output 84,500 tons.

Spottsville Mine, Shaft, No. 9 Seam, 4 ft. thick.

(Continued on Next Page.)

Pittsburgh Coal Co.—Cont.
PO—Spottsville, Ky. SP—Same. CTY—Henderson. RR—L. H. & St. L. Green River.
SM—Annie Stewart, .. Spottsville, Ky.
S of H—1 elec. loco. Track gauge 36 in.
S of M—4 elec. machines.
PP—3 Atlas water tube boilers, total 450 H.P., 1 gen. unit, 250 volts D.C., 3 pumps.
EMP—70.

PLEASANT VIEW JELLICO COAL CO.
Now Estes Jellico Coal Co.

POND CREEK COAL CO.
Pond Creek Mines Nos. 1, 2, 3, 5, 6, 7 and 8, Drifts, Freeburn Seam, 4 to 6 ft. thick.
PO—Stone, Ky. SP—Same. CTY—Pike. RR—W. & P. C. Ry. of N. & W.
PR—T. B. Davis, ...New York City.
TR—F. W. Batchelder, Boston, Mass.
GM—A. R. B isel..........Stone, Ky.
GS—W. R. Davis, " "
PA—W. T. Smythe, Huntington, W. Va.
SCO—Pond Creek Stores Co., Stone, Ky.
S of H—37 elec. loco. Track gauge 44½ in.
S of M—39 elec. machines.
PP—4 B. & W. water tube boilers, total 1,200 H.P., 2 gen. units, 2,300 volts A.C., 3-phase 25-cycle, and 250 volts D.C. Sales agency, Island Creek Coal Sales Co., Cincinnati, Ohio.

POWER COAL CO.
General Office, Jellico, Tenn.
Power Mine; Drift; Dean Seam, 78 to 84 in. thick.
PO—Bradel, Ky.; SP—Bennettsville, Ky.; CTY—Knox; RR—L. & N.
PR—Frank S. Foster, ...Red Ash, Ky.
TR—Louis Francis, " " "
GM—F. S. Foster, " " "
EM—F. S. Foster, " " "
PA—F. S. Foster, " " "
GS—Mack Brown, ...Bradel, Ky.
S of H—Comp. air loco. and mules; track gauge 40 in.
S of M—2 Comp. air mach.
PP—1 Randall water tube boiler, 1 compressor.

PRESTONBURG COAL CO., INC.
General Office, ... Tazewell, Va.
Nos. 1 and 2, Drift; No. 1 Seam; 52 to 59 in. thick.
PO—Prestonburg. Ky. SP— Same. CTY—Floyd; RR—C. & O.
PR—J. S. Gillespie, .. Tazewell, Va.
TR—Barnes Gillespie, " "
GM—J. W. Alley, ..Prestonburg, Ky.
MS—Geo. W. Rarm, " "
EE—C. W. Alley, " "
EM—Edward Holly........Pikeville, O.
SCO—Prestonburg Coal Co., Inc. Buyer, Z. S. Dickerson, Prestonburg, Ky.
S of H—2 elec loco. Track gauge 48 in.
S of M—6 elec. chain machines.
PP—2 Atlas return tubular boilers, total 300 H. P., 1 gen. nit, 250 volts D. C., 1 pump.
EMP -47. No. 2 mine not in operation. Last fiscal year output 42,000 tons. Sales agents, Monarch Coal Co., Richmond, Indiana.

PRINCESS COAL CO.
Princess Mine, Drift, No. 7 Seam, 4 ft. thick.
PO—Princess. Ky. SP—Same. (Prepay) CTY—Poyd. RR—A. C. & I., and C. & O.
PR—C. V Bartels. .... Princess, Ky.
GM—C. V. Bartels, " "
PA—C. V. Bartels, " "
GS—J. C. Price, " "
S of H—Mules. Track gauge 42 in.
S of M—Hand.
EMP—20. Last fiscal year output 10,000 tons. Sales Agency, Pocahontas Winifrede Coal Co.

PROCTOR COAL CO.
1 mine in Kentucky, 1 mine in Tennessee.
Proctor Mines, Drift, Jellico Seam, 3½ ft. thick.
PO—Red Ash, Ky. SP—Jellico Tenn. CTY—Campbell; RR—L. & N., Sou.
PR—Chas. Finley, .Williamsburg, Ky.
GM—Chas. Finley, " "
TR—F. W. Finley, " "
GS—Philip Francis, .. Jellico, Tenn.
PA—Philip Francis, " "
EE—Thos. Francis, " "
EM—Louis Francis, ... Red Ash, Ky.
SM—Geo. W. Davenport, " "
S of H—Mules. Track gauge 40 in.
S of M—2 elec. mach. and hand.
PP—2 Atlas water tube boilers, total 300 H. P., 2 gen. units, 1 2,300 volts A. C., 3 phase 60 cycles. 1,250 volts D. C., 3 pumps.
EMP—40. Last fiscal year output 29,464 tons.

PROVIDENCE MINING CO.
Mines Nos. 2 and 3, Shafts, "No. 9" Seam, 5 ft. thick.
PO—Providence, Ky. SP—Same. CTY—Webster. RR—L. & N., I. C.
PR—W. J. Nisbet, .. Providence, Ky.
GM—W. J. Nisbet, " "
PA—W. J. Nisbet , " "
TR—Percy D. Berry, " "
SM—D. W. Payne, " "
EM—A. L. Donan, " "
EE—Ernest Martin, " "
S of H—2 elec. locos. Track gauge 36 and 42 in.
S of M—Elec. mach.
PP—7 return tubular boilers, total 1,000 H. P., 3 gen. units, 250 volts D.C., 7 pumps.
EMP—250. Last fiscal year output 260,000 tons.

PUCKETTS CREEK COAL CO.
Pucketts Creek Coal Co. Mine; Drift; Harlan Seam; 36 to 40 in. thick.
PO—Burchfield, Ky.; SP—Same; CTY—Bell; RR W. & B.
PR—Dr. Samuel Bennett..Burchfield, Ky.
GM—Dr. Samuel Bennett, " "
TR—W. M. Young, " "
GS—James Dixon.......Burchfield, Ky.
MS—James Dixon, " "
PA—C. J. Hill, " "
SM—C. J. Hill, " "
CE—C. P. Davidson, " "
EM—C. P. Davidson, " "
MM—C. B. Searcy, " "
EE—W. F. Taylor, " "
S of H—2 elec. loco. Track gauge 42 in.
S of M—2 elec. mach.
PP—1 return tubular boiler, total 150 H.P., 250 K. W., 250 volts D. C., 1 pump.

PURITY CANNEL COAL CO. (THE)
General Office, Prestonburg, Ky.
Purity Mine; Drift; Camel and Bituminous Seam; 19 to 28 ins. thick.
PO—Prestonburg. Ky.; SP—Cliff; CTY—Floyd; RR—C. & O., Big Sandy Div.
PR—H. S. Ayers, ...Detroit, Mich.
TR—E. J. Halley......Prestonburg, Ky.
PA—E. J. Halley, " "
S of H—Mules and 1 steam loco. Track gauge 42 in.
S of M—Hand.
EMP—23. Last fiscal year output 11,470.25 tons.
Sales Agents, Ayers & Lang, Detroit, Mich.

RAILEY, THOMAS
Thos. Railey Mine; Drift; 48 to 66 in. thick.
PO—Hawesville, Ky.; SP—Same; CTY—Hancock; RR—L. H. & St. L., Caney Creek branch.
GM—Thos. Railey......Hawesville, Ky.
PA—Thos. Railey, " "
MS—Thos. Rhodes, " "
S of M—Hand.
EMP—8. Last fiscal year output 4,000 tons.

RALSTON COAL CO.
Out of business. Mine purchased by Atlas Coal Mining Co.

REINECKE COAL MINING CO. (THE)
Reinecke Mine, Shaft, No. 11 Seam, 6 ft. thick.
PO—Madisonville, Ky. SP—Same. CTY Hopkins. RR—L. & N.
PR—Caroline Penn......Bellville, Ill.
TR—Mrs. Fred Reinecke, Madisonville, Ky.
GM—Richard Overall, " "
PA—Richard Overall, " "
GS—E. Braun, " "
EM—N. E. Stone, " "
S of H—3 15-ton elec. loco., track gauge 42 in.
S of M—13 elec. mach.
PP—8 Water tube boilers, total H. P. 1,100; 3 gen units, 550 volts D. C., 1 pump.
EMP—225. Last fiscal year output 179,000 tons.

REPUBLIC COAL CO.
Home Mine; Slope; Harlan Seam; 52 to 62 in. thick.
PO—Harlan, Ky.; SP—Same; CTY—Harlan; RR—L. & N.
PR E. Guthrie..........Harlan, Ky.
GM—E. Guthrie, " "
PA—E. Guthrie, " "
GS—E. Guthrie, " "
TR—E. O. Guthrie, " "
MS—A. N. Parrish, " "
CE—Henry Gross, " "
S of H—Mules. Track gauge 42 in.
S of M—1 elec. mach.
PP—220 volts A. C., 3 phase, 60 cycle. Purchase power.
EMP—50. Last fiscal year output 19,000 tons. Sales agents, E. & E. O. Guthrie.

REX COAL COMPANY.
General Office, Kitts, Ky.
Rex Red Ash Mine; Drift; Harlan Seam, 50 to 60 in. thick.
PO—Kitts, Ky. SP—Forester, Ky. CTY—Harlan; RR—L. & N., Wasiata & Black Mtn. Br.
PR—Thomas Bennett, .. Mullis, Ky.
TR—H. H. Bennett, ... Kitts, "
PA—H. H. Bennett, " "
SM—H. H. Bennett, " "
GM—C. V. Bennett, " "
GS—C. V. Bennett, " "
MS—C. V. Bennett, " "
EM—Aaron Creech........Harlan, Ky.
S of H—Mules. Track gauge 42 in.
S of M—10 comp. air mach.
PP—1 Return tubular boiler, 150 H. P. 1 air comp. and 2 pumps.
EMP—50. Last fiscal year output 39,065 tons.
Sales agency, Bewley-Darst Coal Co. Knoxville, Tenn.

RIVER & RAIL COAL & COKE CO.
General Office, Morganfield, Ky.
Shaft Mine; No. 11 Seam; 56 to 60 in. thick.
PO—Uniontown, Ky.; SP—Same; CTY—Union; RR—I. C.
PR—G. L. Drury.....Morganfield, Ky.
TR—W. T. Drury, " "
GM—J. H. McManaman, Morganfield, Ky.
PA—A. D. Reid.......Uniontown, Ky.
GS—A. D. Reid......Uniontown, Ky.
MS—A. D. Reid, ... Uniontown, "
EM—C. W. McElroy, ..Morganfield, Ky.
MM—Chas. Marshall....Uniontown, Ky.
EE—D. A. Mattingley, Morganfield, Ky.
SCO—River & Rail Coal & Coke Company Store. Buyer, A. D. Reid, Uniontown, Ky.
S of H—Mules. Track gauge 42 in.
S of M—6 elec. mach.
PP—2 return tubular boilers, total 300 H. P., 2 generating units, 250 volts D. C., 2 pumps.
EMP—7. Last fiscal year output 4,000 tons.
Note—Idle greater part of year.

ROCK ISLAND COAL CO.
Out of business.

ROCKPORT COAL CO.
Crown Mine; Shaft; No. 9 Seam; 54 to 62 in. thick.
PO—Rockport, Ky. SP—Same. CTY—Ohio. RR—I. C. R. R.
PR—H. L. Tucker, .. Rockport, Ky.
TR—P. O. McKinney, " "
GM—H. L. Tucker, " "
PA—H. L. Tucker........Rockport, Ky.
GS—Bayless Baker, " "
EM—Geo. Wales, .. Central City, Ky.
..**SCO**—Address the Company. Buyer L. F. Gibbs, Rockport, Ky.
S of H—Mules and one 5-ton elec. loco. Track gauge 42 in.
S of M—9 elec. chain machines.
PP—2 Henry Vogt water tube boilers, total 300 H. P., 1 gen. unit, 250 volts D. C., 2 pumps.
EMP—150. Last fiscal year output 77,000 tons. Sales agent, P. O. McKinney, Rockport, Ky.

ROSE CREEK COAL CO.
Shaft Mine, No. 9 Seam.
PO—Nebo, Ky. SP—Same. CTY—Hopkins. RR—L. & N.
GM—B. B. Rice, ... Nebo, Ky.
PA—B. B. Rice, " "
SM—B. B. Rice, ... Nebo, Ky.
MS—Fred Dox, " "
S of H—3 elec. locos.
S of M—9 elec. mach.
PP—2 boilers, total 250 H. P., 1 gen. unit, 250 volts D. C.
EMP—150.
(Old information.)

ROYAL COLLIERIES CO. THE
General Office, Jackson, O.
Kentucky Gem Mine; Shaft; "No. 1" Seam; 40 in. thick.
PO—Offuth, Ky; SP—Same; CTY—Johnson; RR—C. & O., Big Sandy Branch.
PR—David Armstrong.......Jackson, O.
GM David Armstrong, " "
TR—J. A. McGheel........Jackson, O.
PA—F. L. Long,..........Offuth, Ky.
GS—F. L. Long, " "
MS—J. H. Blevims " "
MM—John Sparks, " "
EE—John Sparks, " "
SCO—Address the Company. Buyer, F. L. Long, Offuth, Ky.
S of H—1 electric loco. Track gauge 36 in.
S of M—7 elec. machines.
PP—2 water tube boilers, 3 gen. units, 500 volts D. C., 1 pump.
EMP—86. Last fiscal year output 40,862.39 tons. Sales agent, E. W. Ervin, 1046 Ohio Bldg., Toledo, Ohio.

RUCKMAN COAL CO.
Highland Mine, Shaft, No. 9 Seam, 5 ft. 3 in. thick.
PO—Providence, Ky. SP—Same. CTY—Webster. RR—L. & N. I. C.
PR—D. J. Ruckman,. Providence, Ky.
GM—D. J. Ruckman, " "
PA—D. J. Ruckman, Providence, Ky.
TR—F. V. Ruckman, " "
GS—E. B. Robinson, " "
MS—W. D. Robinson, " "
CE—Thos. O. Long, " "
EM—Thos. O. Long, " "
MM—Thos. Blondon, " "
EE—Clarence Gray, " "
SCO—Ruckman Store Co., Buyer, J. B. Simpson.
S of H—Rope
S of M—Hand.
PP—2 boilers each 125 H. P.
EMP—70. Last fiscal year output 82,000 tons. Sales agent, E. M. Young, Providence, Ky.

RUDY, GEORGE H. & CO.
Overstreet and Rudy Mine, Shaft, No. 9 Seam, 4 ft. thick.
PO—Owensboro, Ky. RD 4. SP—Owensboro. CTY—Daviess. RR—L. & N., I. C. & St. L.
PR—G. H .Rudy, ... Owensboro, Ky.
TR—K. F. Rudy, " "
GM—G. H. Rudy, " "
PA—G. H. Rudy, " "
SM—G. H. Rudy, " "
S of H—Mules. Track gauge 35½ in.
S of M Hand.
PP—1 John Vane boiler, 35 H. P., 1 engine, 25 H. P., 1 pump.
EMP—20. Last fiscal year output 11,853 tons. Sales Mgr., G. H. Rudy.

RUDY, J. LEE
J. H. Rudy Mine; Shaft; No. 9 Seam; 48 to 54 in. thick.
PO—Owensboro, Ky.; SP—Same; CTY—Daviess; RR—L. & N.
TR—J. Lee Rudy.......Owensboro, Ky.
GS—J. M. Howard, " "
SM—J. M. Howard, " "
MS—Geo. Gunn, " "
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—1 water tube boiler, total 60 H. P. 1 pump.
EMP—14. Actual output for last fiscal year 17, 725 tons.

RUDY, JOHN M.
John M. Rudy Mine; Drift; Seam 60 in. thick.
PO—Owensboro, Ky.; SP—Same; CTY—Davies; RR—L. & N.
PR—John M. Rudy, ... Owensboro, Ky.
GM—John M. Rudy, " "
PA—John M. Rudy, " "
MS—Henry Yecking, " "
CE—Mr. Hart, " "
EM—Mr. Hart, " "
S of H—Mules.
S of M—Hand.
EMP—8. Last fiscal year output 70,000 tons.

RUSH BRANCH CANNEL COAL CO.
General Office, Mt. Sterling, Ky.
Mine Cannel Seam, 60 in. thick.
PO—Lenox, Ky.; SP—Redwine, Ky. CTY—Morgan; RR—Morehead and North Fork.
PR—John A. Judy, Mt. Sterling, Ky.
TR—R. H. Winn, " "

ST. BERNARD MINING CO.
General Office, ... Earlington, Ky.
PR—Geo. C. Atkinson, " "
Secy—Dan M. Evans, " "
VP & GM—Frank D. Rash, " "
GS—A. G. Spillman, " "
PA—W. E. Rash, " "
CHIEF EM—R. E. Wipfler, " "
MM—D. W. Umstead, " "
EE—N. W. Umstead, " "
SCO—St. Bernard Mng. Co. " "
Buyer, W. R. Coyle, " "
Sales agent, Dan M. Evans, " "

No. 9 Mine, Slope, No. 9 Kentucky Series, Seam 4 to 6 ft. thick Washery at Coke Ovens.
PO—Earlington, Ky. SP—Same. CTY—Hopkins. RR—L. & N., (H. Div).
MS—E. R. Barnett, .. Earlington. Ky.
S of H—Mules, rope and 2 elec. loco. Track gauge 44 inches.
S of M—15 comp. air machines.
PP—2 return tubular boilers. Electricity and air furnished from No. 11 Mine.
EMP—190. Last fiscal year output 150,215 tons. 155 Bee Hive Coke ovens.

No. 11 Mine, Drift, No. 11 Seam, 5 ft. 10 in. to 7 ft. thick.
PO—Earlington. Ky. SP—Same. CTY—Hopkins. RR—L. & N., (H. Div).
MS—Henry Wyatt.....Earlington, Ky.
S of H—Mules, 1 elec. and 1 steam loco.; track gauge 44 in.
S of M—12 Comp. air mach.
PP—6 Return tubular boilers, total 800 H. P., 1 General Electric low pressure 500 K. W. Turbine, 1 general Electric high pressure 200 K. W Turbine, 2300 volts A. C., 60 cycle 3-phase.
EMP—190. Last fiscal year output 112,653 tons.

Hecla Mine, Drift, No. 9 Seam, 4½ to 5 ft. thick.
PO—Earlington. Ky. SP—Same. CTY—Hopkins. RR—L. & N., (H. Div).
MS—Wm. Jennings....Earlington, Ky.
S of H—Mules and 2 elec. loco., track gauge 37½ in.
S of M—5 elec. machines.
PP—Electricity furnished from No. 11 Mine.

EMP—145. Last fiscal year output 105,765 tons.

Diamond Mine, Drift, No. 9 Seam, 4 ft. 4 in. to 5 ft. thick.
PO—Mortons Gap, Ky. SP—Mortons. CTY—Hopkins. RR—L. & N. (H. Div.)
MS—J. Henry Harris. Mortons Gap, Ky.
SM—Henry L. Browning, " "
S of H—Mules and 3 elec. loco., track gauge 44 in.
S of M—14 Comp. air machines.
PP—4 Return tubular boilers, total 600 H. P., 1 125-K. W. Gen. unit, 250 volts D. C., 3 air comp.
EMP—200. Last fiscal year output 173,619 tons.

Arnold Mine, Drift, No. 9 Seam, 4 to 5 ft. thick.
Hopkins. RR—L. & N., (H. Div).
MS—John Rule, ... Earlington, Ky.
MS-Asst—Lee Nichols, " "
S of H—Mules and 2 elec. loco., track gauge 44 in.
S of M—15 comp. air mach.
PP—5 Return tubular boilers, total 750 H. P., 1 150-K. W. gen. unit and 1 75-K. W. gen. unit, 250 volts D. C., 3 air comp.
EMP—200. Last fiscal year output 146,983 tons.

Arnold No. 11; Drift; No. 11 Seam, 5 ft. 10 in. to 7 ft. thick.
PO—Earlington, Ky. SP—Same. CTY—Hopkins. RR—L. & N., (H. Div).
MS—John Rule, ... Earlington, Ky.
MS-Asst—Geo. T. Sadler. Earlington, Ky
S of H—Mules and 2 elec. loco. Track gauge 44 in.
S of M—10 comp. air mach.
PP—Power and air from Arnold No. 1.
EMP—100. Last fiscal year output 95,976 tons.

St. Charles Mine, Drift, No. 9 Seam, 4½ to 5 ft. thick.
PO—St. Charles, Ky., SP—Same, CTY—Hopkins. RR—Ill. cent. (Lou. Div.)
MS—Willis T. Sisk...St. Charles, Ky.
SM—Jesse Phillips, " "
S of H—Mules, and 2 elec. loco., track gauge 44 in.
S of M—18 comp. air machines.
PP—4 Return tubular boilers, total 600 H. P., 1-125 K. W. gen. unit 250 volts D. C.
EMP—225. Last fiscal year output 210,499 tons.

Luton Mine, Shaft, No. 9 Seam, 5 to 6 ft. thick.
PO—Providence, Ky., SP—Same, CTY—Webster; RR—L. & N. (H. Div.)
MS—Henry Salmon.....Providence, Ky.
SM—Joseph Teague, "
S of H—Mules; track gauge 44 in.
S of M—5 comp. air mach.
PP—2 return tubular boilers, total 150 H. P., 1 air comp.
EMP—60. Last fiscal year output 65,924 tons.

Shamrock Mine, Shaft, No. 11 Seam, 5 ft. 10 in. to 6½ ft. thick.
PO—Providence, Ky., SP—Same. CTY—Webster. RR—L. & N. (H. Div.)
MS—John J. Harland...Providence, Ky.
SM—Joseph Teague, " "
S of H—Mules, rope and 2 elec. locos. Track gauge 44 in.
S of M—14 Comp. air machines.
PP—5 return tubular boilers, total 600 H. P., 2 air comp.
EMP—225. Last fiscal year output 142,573 tons.

SANDY RIVER COAL CO.

General Office, Chicago, Ill.
Sandy River Mine, Drift; "No. 4" Seam, 46 to 48 in. thick.
PO—Williamsport, Ky.; SP—Offutt, and Lower Greasy, Ky.; CTY—Johnson; RR—C. & O.
PR—F. A. Stacey........Chillicothe, O.
TR—J. P. Dieter.........Chicago, Ill.
GM—J. P. Dieter, " "
PA—C. C. Ward......Williamsport, Ky.
MS—C. C. Ward, " "
SM—C. C. Ward, " "
S of H—Mules, and 2 Steam loco; track gauge 42 in.
S of M—Hand.
EMP—48. Last fiscal year output 18,000 tons.

SEBREE MINING COMPANY

Sebree Mine; Shaft; No. 9 Seam; 48 to 54 in. thick.
PO—Sebree, Ky.; SP—Same; CTY—Webster; RR—L. & N., Henderson Div.
PR—J. B. Brown.........Sebree, Ky.
GM—J. B. Brown " "
GS—J. B. Brown " "
TR—Geo. R. Arbuckle " "
PA—Geo. R. Arbuckle " "
CE—Geo. R. Arbuckle " "
S of H—Mules.
S of M—Hand.
PP—3 return tubular boilers, 240 H. P.
EMP—30.

SHARON COAL & COKE CO.

Sharon Mine; Drift; Freeburn Seam, 48 to 60 in. thick.
PO—Sharondale, Ky.; SP—Same; CTY—Pike; RR—W. & P. C.
PR—J. J. Tierney....Philadelphia, Pa.
TR—J. L. Tierney....Bluefield, W. Va.
GM—O. W. Evans....Sharondale, Ky.
GS—O. W. Evans, " "
PA—O. W. Evans, " "
MS—J. M. Aliff, " "
MM—W. S. Keisling, Sharondale, Ky.
EE—W. S. Keisling, " "
SM—E. L. Reams, " "
S of H—2 Elec. loco.; track gauge, 48 in.
S of M—4 elec. mach.
PP—4 Erie City return tubular boilers, 600 H. P., gen. unit, 250 volts D. C.
EMP—50. Last fiscal year output 61,351 tons.

SHELBY COAL MINING CO (THE)

General Office, Warren, Ohio.
Mine, Drift, Upper Elkhorn Seam, 5½ ft. thick.
PO—Shelbiana, Ky., SP— Shelby, Ky., CTY—Pike. RR—C. & O.
PR—Dan Geiger........Warren, Ohio.
TR—L. L. Jones, " "
GM—E. F. Peirce.......Ashland, Ky.
MS—B. L. Blair......Shelbiana, Ky.
S of H—Mules; track gauge 42 in.
S of M—Hand.

SMITH MILLS COAL & MINING CO.

Smith Mills Mine; Shaft, No. 12 Seam, 6½ to 7 ft. thick.
PO—Smith Mills, Ky., CTY—Henderson; RR—Not on R. R.
PR—Dr. J. W. Cooper, Smith Mills, Ky.
TR—W. W. Cooper, " "
GM—W. W. Cooper, " "
PA—W. W. Cooper, " "
CE—R. D. Ousbourn.
S of H—Mules; track gauge 34 in.
S of M—Hand.
PP—2 Boilers.
EMP—8. Last fiscal year output 5,000 tons.

SMITH & RILEY COAL CO.

PO—Barbourville, Ky.; SP—Same; CTY—Knox.
No report.

SMOKELESS COAL CORP.

See Camp Mining Co.

SOUTH EAST COAL CO.

General Office, 1732 Commercial Trust Bldg., Philadelphia, Pa.
No. 1 Mine; Drift; Elkhorn Seam; 48 to 60 in. thick.
PO—Seco, Ky.; SP—Same; CTY—Letcher; RR—Louisville & Nashville, L. & E. Div.
PR—A. D. W. Smith...Philadelphia, Pa.
SEC—Carl B. Metzger, " "
GM—H. LaViers.......Paintsville, Ky.
MS—W. W. Merwin.........Seco, Ky.
EM—E. M. Clay, " "
SM—W. T. Davis, " "
SCO—Seco Store.
S of H—1 elec. loco. Track gauge 42 in.
S of M—6 elec. mach.
PP—2 return tubular boilers, Casey Hedges Co., total 250 H. P., 1 gen. unit, 230 volts D. C.
EMP—70.

SOUTHERN MINING CO.

General Office, Williamsburg, Ky.
Toms Creek Mine; Drift; Creech Seam; 50 to 56 in. thick.
PO—Balkan, Ky., SP—Same, CTY—Bell; RR—L. & N., Ky. Virginia br.
PR—A. Gatliff .... Williamsburg, Ky.
TR—E. C. Mahan....Knoxville, Tenn.
GM—T. B. Mahan...Williamsburg, Ky.
GS—C. B. Richardson......Balkan, Ky.
PA—C. B. Richardson, " "
SM—E. R. Roberts, " "
MS—C. B. Richardson, " "
EM—J. W. Green, " "
MM—G. D. Bengey " "
EE—G. D. Bengey, " "
CE—F. E. Gilbert.........Colmar, Ky.
SCO—Southern Mining Co. General Store. Buyer, E. R. Roberts, Balkan, Ky.
S of H—5 Elec. loco., track gauge 44 in.
S of M—8 elec. mach.
PP—2300 volts A. C., 3 phase, 4 pumps. Buy power.
EMP—225. Last fiscal year output 159,066 tons. Sales Agency, Southern Coal & Coke Co., Knoxville, Tenn.

Crane Creek Mine; Drift; Mason Seam; 36 to 40 in. thick.
PO—Colmar; SP—Same; CTY—Bell; RR—L. & N., Ky. Virginia branch.
MS—F. E. Gilbert.........Colmar, Ky.
SM—Fred Holtzworth, " "
S of H—2 elec. loco. Track gauge 44 ins.
S of M—1 elec. mach.
PP—2300 volts A. C., 3 phase, 2 pumps, Purchase power.
EMP—175. Last fiscal year output 80,415 tons.

STANLEY COAL CO.

Margrette Mine; Drift; No. 1 Elkhorn Coking Seam, 42 to 56 in. thick.
PO—Lackey, Ky.; SP—Same; CTY—Floyd; RR—C. & O., Beaver Creek Br.
PR—A. J. Johnson........Lackey, Ky
TR—E. R. Price..........Lackey, Ky.
GM—A. J. Johnson, " "
PA—A. J. Johnson, " "
MS—J. O. Johnson, " "
SCO—Wm. Sturgill & Son, " "
S of H—Mules; track gauge 36 in.
S of M—Hand.
EMP—14. Output from 10-1 to 12-31-15, 1818 tons.
Note—Will install electric plant and electric mining machines shortly.

STEARNS COAL & LUMBER CO (THE)

General Office, Stearns, Ky.
PR—J. S. Stearns.....Ludington, Mich.
TR—R. L. Stearns.......Stearns, Ky.
GM—J. E. Butler, " "
PA—R. W. Henderson, " "
SM—K. W. Dyas, " "
EM—George Humble, " "
MM—C. L. Larmee, " "
Sales Agent, K. W. Dyas, Stearns, Ky.

No. 1 Mine, Drift; No. 2 Seam, 4 to 5 ft. thick.
PO—Barthell, Ky.; SP—Same CTY—McCreary; RR—K. & T.
MS—J. M. McGuffey....Barthell, Ky.
S of H—3 Elec. loco. and mules; track gauge 42 in.
S of M—Elec.
PP—Central Station, 5 pumps.
EMP—150. Last fiscal year output 83,930 tons.

No. 4 Mine, Slope; No. 1 Seam, 2 to 8½ ft. thick.
PO—Worley, Ky.; SP—Same; CTY—McCreary; RR—K. & T.
MS—Jos. Cain............Worley, Ky.
SM—E. S. Stephens, " "
S of H—4 Elec. loco. and mules; track gauge 42 in.
S of M—4 Elec. and 12 comp. air mach. and hand.
PP—Central Plant, 1 comp., 5 pumps.
EMP—375. Last fiscal year output 156,829 tons.

No. 2 Mine; Drift; No. 2 Seam, 3½ to 5 ft. thick.
PO—Barthell, Ky.; SP—Same; CTY—McCreary; RR—K. & T.
MS—J. M. McGuffey....Barthell, Ky.
SM—Geo. Walker, " "
S of H—Mules; track gauge 42 in.
S of M—Hand.
EMP—25. Last fiscal year output 6,812.25 tons.

Nos. 10 and 11 Mines; Drift; No. 1 Seam, 3 to 6 ft. thick.
PO—Yamacraw, Ky.; SP—Same; CTY—McCreary; RR—K. & T.
MS—W. T. Head, ... Yamacraw, Ky.
SM—P. M. Stephens, " "
S of H—3 gasoline loco. and mules; track gauge 42 in.
S of M—Hand.
PP—Central Plant.
EMP—400. Last fiscal year output 233,188.40 tons.

STEELE COAL CO. (THE)

General Office, ... Dayton, O.
Steele and Cabin Branch Mines, Slope No. 4 Seam, 60 in. thick.
PO—Mossy Bottom, Ky. SP—Wagner, Ky. CTY—Pike. RR—C. & O., Big Sandy Division.
PR—Edward B. Wright......Dayton, O.
TR—Edward B. Wright, " "
GM—Edward B. Wright, " "
GS—S. A. Gantz....Mossy Bottom, Ky.
PA—S. A. Gantz, " "
MS—H. W. Fife, " "
EM—Stoney Amick, .. Pikeville, "
SCO—The Steele Coal Co. Store. Buyer, Edgar Steele, Mossy Bottom, Ky. Sales agents, The Sheridan Coal Co., Dayton, O.
S of H—Mules and 1 Elec. loco.; track gauge 48 in.
S of M—5 elec. machines.
PP—2 Erie City water tube boilers, total, 250 H.P., 2 gen. units, 250 volts D. C., and 1 pump.
EMP—125. Last fiscal year output 88,165 tons.

STIRLING COAL CO., INC.

Daniel Boone Mine, Slope, No. 11 Seam, 6½ ft. thick.
PO—Daniel Boone, Ky. SP—Same. CTY—Hopkins. RR—I. C.
PR—D. T. McMullen...Cumberland, Md.
TR—Hugh A. McMullen, " "
SEC—Jas. P. Barrett, " "
GM—John Hugett.....Daniel Boone, Ky.
EE—W. E. Compton, " "
CE—W. A. McDonald, Central City, "
EM—W. A. McDonald, " "
SM—O. H. Carter, Daniel Boone, "
S of H—Rope.
S of M—5 elec. mach.
PP—3 return tubular boilers, 1 gen. unit 250 volts D. C., 1 pump.
EMP—125. Last fiscal year output 117,104 tons.

STONY FORK COAL CO.

Out of Business. See Pinnacle Coal Mining Co.

STROTHER & REYNOLDS COAL CO.

Rush, Ky. No report.

STURGEON CREEK COAL CO.

General Office, Beattyville, Ky.
Idamay Mine; Drift; Beattyville Seam, 32 to 42 in. thick.
PO—Idamay, Ky.; SP—Same; CTY—Lee; RR—L. & N., Sturgeon Branch.
PR—H. D. Parrish, Beattyville, Ky.
PA—H. D. Parrish, " "
TR—G. W. Gourley, " "
MS—G. H. Jackson, " "
S of M—Hand.
S of H—Mules; track gauge, 42 in.
PP—1 Pump.
EMP—15.
Output, 7,126.45 Tons.
Sales Agency, Pluto Coal Co., Lexington, Ky.

SUNSET COAL CO.

Royal Mine; Shaft; No. 11 Seam, 72 to 80 in. thick.
PO—Madisonville, Ky. SP—Same. CTY—Hopkins. RR—L. & N.
TR—W. D. Coil......Madisonville, Ky.
GM—W. D. Coil, " "
GS—W. E. Carroll, " "
MS—Thomas Rodgers, " "
CE—Earl Stone. " "
EM—Earl Stone, " "
MM—Ed. Rodgers, " "
EE—Ed. Rodgers, " "
PA—H. H. Coil, " "
SCO—W. D. Coil Mercantile Co. Buyer, F. E. Coil, Madisonville, Ky.
S of H—1 elec. loco. and mules. Track gauge 42 in.
S of M—11 elec. mach.
PP—2 return tubular boilers, total 175 H. P., 1 gen. unit, 275 volts D. C., 2 pumps.
EMP—129. Last fiscal year output 128,000 tons.

SUPERIOR COAL COMPANY

General Office, Praise, Ky.
Superior Mine; Drift; 40 in. thick.
PO—Praise, Ky.; SP—Elkhorn City, Ky.; CTY—Pike; RR—C. C. & O., and C. & O.
PR—D. D. Cox........Castlewood, Va.
TR—F. G. Craig.........Jenkins, Ky.
GM—W. F. Brooks........Praise, Ky.
CE—L. S. Johnson, " "
S of H—Mules.
S of M—Hand.

TAYLOR COAL CO. OF KY.

See Beaver Dam Coal Co.

THACKER COAL MINING CO.

Thacker and Alma Mines; Drift; Thacker Seam, 46 to 72 in. thick.
PO—Rose Siding, W. Va. SP—Same. CTY—Pike; RR—N. & W.
PR—J. K. Anderson, Charleston, W.Va.
TR—J. K. Anderson, " "
GM—J. K. Anderson..Charleston, W.Va.
PA—G. M. Slaughter, Rose Siding, W.Va.
MS—A. L. Copley, " "
SM—S. B. Cox, " "
S of H—Mules. Track gauge 48 in.
S of M—11 comp. air mach.
PP—2 boilers, total 200 H. P., 1 air comp.
EMP—110. Last fiscal year output 92,567 tons.

THAYER, N. (Est.) Ky Properties.

General Office, Riverton, Ky.
Lost Creek Mine, Drift, Kentucky No. 7 Seam, 38 to 48 in. thick.
PO—Partlow, Ky. SP—Willard, Ky. CTY—Carter; RR—E. K.
GM—Sturgis G. Bates, ..Riverton, Ky.
PA—Sturgis G. Bates, " "
MS—Lewis Duncan, ... Partlow, "
SCO—Willard Store, buyer, D. F. Webb, Partlow, Ky.
S of H—Mules. Track gauge, 36 in.
S of M—Hand.
EMP—23. Last fiscal year output 10,000 tons.

TIERNEY MINING CO.

Tierney Mines, 1, 2 and 3 Drifts, Freeburn Seam, 5 ft. thick.
PO—Stone, Ky. SP—Same. CTY—Pike. RR—W. & P. C.
PR—L. E. Tierney,..Powhatan, W. Va.
TR—L. H. Clark, ... Kyle, "
GM—R. H. Heyser, ... Stone, Ky.
PA—Oscar Hypes, " "
EE—Nat. Hale, " "
MS—P. J. Doolan, " "
SM—M. M Strong, " "
S of H—3 Elec. loco.; track gauge 44 in.
S of M—6 Elec. mach.
PP—3 return tubular boilers, total 450 H.P., 1 gen. unit, 250 volts D. C. Last fiscal year output, 116,000 tons.

TROSPER COAL CO. (THE)
Bennett No. 1 Mine, Drift, Dean Seam, 6 ft. thick.
PO—Bradel, Ky. SP—Bennettsville, Ky. CTY—Knox. RR—Cumberland RR.
PR—J. H. Bradley........Bradel, Ky.
GM—J. H. Bradley, " "
PA—J. H. Bradley,
TR—S. W. McComb......Pineville, Ky.
MS—J. Q. Angel,.........Bradel, Ky.
SM—W. D. Ellison, " "
S of H—Mules and 1 gasoline loco.; track gauge 42 in.
S of M—10 Comp. air machines.
PP—3 Atlas return tubular boilers, total 450 H. P., 2 air comp. and 5 pumps.
EMP—75. Last fiscal year output 51,500 tons.

TURKEY GAP COAL & COKE CO.
General Office, Ennis, W. Va.
Freeburn Nos. 1 and 2 Mines, Drift.
PO—Edgarton, W. Va. SP—Arrow, Ky. CTY—Pike. RR—Sou.
GM—E. J. McQuail, .. Ennis, W. Va.
PA—J. P. Curtis, .. Edgarton, "
EM—C. H. Deaton, " "
MS—Jas. Houn, " "
SM—J. P. Curtis,
S of H—Elec. loco.
S of M—Elec. mach.
PP—Gen. unit D.C.
EMP—350.
(Old information.)

TWAY, R. C. MINING COMPANY.
General Office, Louisville, Ky.
Tway Mine, Drift, 42 to 46 in. thick.
PO—Anchor, Ky. SP—Same. CTY—Knox. RR—Cumberland.
PR—R. C. Tway, ... Louisville, Ky.
TR—W. F. Burwinkle, " "
GS—Hugh M. Stokes......Harlan, Ky.
MS—M. Cecil............Anchor, Ky.
SM—Chas. H. Smith, " "
S of H—Mules. Track gauge 42 in.
S of M—10 comp. air machs.
PP—boilers, total 275 H.P., 1 pump. Capacity 300 tons per day. Only operated since June. Sales agent, R. C. Tway Coal Co., Louisville, Ky.

UNIONTOWN COAL & MINING CO.
Uniontown Mine, Shaft, "No. 11" Seam; 58 to 66 in. thick.
PO—Uniontown, Ky. SP—Same. CTY—Union. RR—I. C.
PR—S. K. Hughes..........Kyle, Ohio
TR—B. C. Davison,.....Uniontown, Ky.
GM—B. C. Davison, " "
GS—B. C. Davison, " "
PA—B. C. Davison, " "
MS—Wm. Hammond,
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—2 water tube boilers, total 130 H. P., 2 pumps.
EMP—14. Last fiscal year output 9,540 tons.

VICTOR FUEL CO.
Diamond Block Mine; Shaft; No. 9 Seam, 66 in. thick.
PO—Drakesboro, Ky.; SP—Same; CTY—Muhlenberg; RR—L. & N., O. & N. Div.
PR—J. R. Allen, ...Drakesboro, Ky.
TR—Viva Thompson, " "
GM—J. M. Thompson, " "
EM—George Wales, " "
SCO—Address the Company.
S of H—1 Elec. loco; track gauge, 36 in.
S of M—8 Elec. Mach.
PP—2 Return tubular boilers, total 300 H.P., 1 gen. unit 250 volts D.C., 3 pumps.
Sales Agent, F. A. Vaughan.

VICTORIA COAL CO.
VP—M. B Ray........Earlington, Ky.
TR—Paul P. Price, " "
GM—F. D. Rash, " "
PA—W. E. Rash, " "
CE—R. E. Whipple, " "
EE—U. W. Umstead, " "

Victoria No. 11 Mine; Shaft; No. 11 Seam, 72 to 78 in. thick.
PO—Madisonville, Ky.; SP—Same; CTY—Hopkins; RR—L. & N.
S of H—1 Elec. loco and mules; track gauge 43 in.
S of M—10 Comp. air machs
PP—2 Compressors.
EMP—150.

Victoria No. 9 Mine; Shaft; No. 9 Seam, 60 in. hick.
PO—Madisonville, Ky.; SP—Same; CTY—Hopkins; RR—L. & N.
S of H—Mules.
S of M—2 short wall mach.
EMP—75.

VULCAN COAL COMPANY.
Vulcan Mine, Drift, "Vulcan" or "Freeburn" Seam, 3 ft. 4 in. to 7 ft. 6 in. thick.
PO—Vulcan, W. Va. SP—Delmorme, W. Va. CTY—Mingo. RR—N. & W., Main Line.
PR—W.C. Stephenson, Roanoke, Va.
TR—W.C. Stephenson, " "
GM—Roger Martin.......Vulcan, W.Va.
PA—F.C. Thornton, " "
SM—F.C. Thornton, " "
MS—George Foster,
EM—R. F. Haskins, Bluefield, W. Va.
S of H—Mules, 1 gasoline and 1 elec. loco. Track gauge 56½ in.
S of M—Hand.
PP—2 return tubular boilers, total 250 H.P., 1 gen. unit, 250 volts D.C.
EMP—108. Last fiscal year output 82,759 tons.

WALLEN, GEO. M. COAL CO.,
Lessee of El Coal Company.
El Coal Co. Mine; Drift; Jellico Seam; 41 in. thick.
PO—Gatliff, Ky; SP—Same; CTY—Whitley; RR—L. & N.
PR—Geo. M. Wallen, Gatliff, Ky.
GM—Geo. M. Wallen, Gatliff, Ky.
S of H—Mules and 2 gasoline locos.
S of M—Hand.

WALLINS CREEK COAL COMPANY
General Office. Pineville, Ky
PR—F. D. Wood........Pineville, Ky.
TR—C. J. Johnson, " "
EM—W. R. Denham,
MS—R. B. Winkler.......Wallins, Ky.
SM—L. A. Bowling......Blackjoe, Ky.

Black Star Mine; Drift; Wallins & Harlan Seams; 84 in. thick.
PO—Wallins Creek, Ky.; SP—Wallins, Ky.; CTY—Harlan; RR—L. & N., W. & B. M. branch.
S of M—Mules and 1 elec. loco. Track gauge 42 in.
S of M—3 elec. mach.
PP—2 water tube boilers, total 300 H. P., 1 air compressor. Purchase power.

Black Crescent Mine; Drift; Wallins & Harlan Seams; 42 to 48 in. thick.
PO—Blackjoe, Ky.; SP—Wood; CTY—Harlan; RR—L. & N., W. & B. M. branch.
S of H—1 elec. loco.
S of M—4 elec. mach.

Black Comet Mine; Drift; Wallins & Harlan Seams; 48 to 60 in. thick.
PO—Harlan, Ky.; SP—Same; CTY—Harlan; RR—L. & N., W. & B. M. branch.
S of H—Mules.
S of M—20 comp. air mach.

WASHINGTON COAL CO.
Monroe Mine.
PO—Providence, Ky.; CTY—Webster.
No report.

WATTS CREEK JELLICO COAL CO.
See New Watts Creek Jellico Coal Co.

WAVERLY COAL CO.
Shaft Mine; No. 11 Seam, 60 in. thick.
PO—Waverly, Ky.; SP—Same; CTY—Union; RR—I. C.
PR—R. C. Arnold, Waverly, Ky.
PA—R. C. Arnold, " "
MS—P. Connoley, " "
S of H—Mules. Track gauge 36 in.
S of M—Hand and 2 elec. mach.
PP—2 boilers, total 300 H. P., 1 gen. unit, 250 volts D. C., 2 pumps.
EMP—60.

WEST KENTUCKY COAL CO.
General Office, Sturgis, Ky.
PR—J. D. Mortimer,
30 Broad St., New York, N. Y.
TR—Asst. C. D. Burdick, Sturgis, Ky.
VP—C.F. Richardson, " "
GM—C.F. Richardson, " "
GS—T.E. Jenkins, " "
PA—W.S. Williams, " "
EM—C. W. Strickland, " "
EE—Sherman Melton " "
SCO—West Kentucky Coal Co.
Buyer, H. H. Smith....Sturgis, Ky.
Sales agency, West Kentucky Coal Co., Paducah, Ky.

Nos. 1 and 2 Mines, No. 1 Slope and No. 2 Shaft, No. 9 Seam, 4 ft. 10 in. thick.
PO—Sturgis, Ky. SP—Same. CTY—Union; RR—Ill. Cent., Evansville Branch.
MS—H.M. Ernst, ... Sturgis, Ky.
S of H—Mules, rope and 2 Elec. loco. Track gauge No. 1, 36 in. and No. 2 40 in.
S of M—9 Elec. mach.
PP—3 Milne water tube and 2Atlas return tubular boilers, total 1,050 H. P., 2 gen. units, 250 volts D.C., 3 hoisting engines and 2 fan engines, 2 pumps.
EMP—173. Last fiscal year output 241,427 tons.

Nos. 3 and 4 Mines; Slopes; No. 11 Seam, 6 ft. thick.
PO—Wheatcroft. Ky. SP—Same. CTY Webster; RR—Ill. Cent., Dixon Br.
MS—J.W. Martin, .. Wheatcroft, Ky.
S of H—Mules and 5 elec. loco. Track gauge 40 in.
S of M—9 elec. machines.
PP—2 Atlas and 2 C. J. Walton return tubular boilers, total 600 H. P., 4 gen. units, 500 volts, D. C. 2 pumps.
EMP—166. Last fiscal year output 164,903 tons.

No. 5 Mine, Shaft, No. 12 Seam, 6 ft. thick.
PO—Clay, Ky. SP—Wheatcroft, Ky. CTY—Webster. RR—Ill. Central. Dixon Br.
MS—James Palmer..........Clay, Ky.
S of H—Mules and 2 elec. loco. Track gauge 3 ft.
S of M—4 elec. machines.
PP—2 C. J. Walton return tubular boilers total 300 H. P., gen. unit 250 volts D. C.; hoisting engine and fan engine, 1 pump.
EMP—78. Last fiscal year output 73,301 tons.

No. 6 Mine, Shaft, No. 9 Seam, 4 ft. 10 in. thick.
PO—Wheatcroft, Ky. SP—Same. CTY—Webster; RR—Ill. Cent., Dixon Br.
MS—J. W. Martin, ..Wheatcroft, Ky.
S of H—Mules and 2 elec. loco. Track gauge 40 in.
S of M—3 Elec. mach.
PP—1 C. J. Walton return tubular boiler, 150 H.P., 1 hoisting engine and 1 fan engine, 1 pump.
EMP—67. Last fiscal year output 23,439 tons.

No. 7 Mine, Shaft, No. 12 Seam, 7½ ft. thick.
PO—Clay, Ky. SP—Same. CTY—Webster. RR—L. & N.. Ill. Cent. ster; RR—L. & N., Ill. Cent., Dixon Br.
MS—James Palmer..........Clay, Ky.
S of H—Mules and 3 elec. loco. Track gauge 3 ft. 4 in.
S of M—12 elec. mach.
PP—4 C. J. Walton return tubular boilers, total 600 H. P., 2 gen. units, 250 volts D. C., 2 hoisting engines and 1 fan engine, 1 pump.
EMP—245. Last fiscal year output 400,954 tons.

Nos. 8 and 9 Mines, Slope and Shaft, No. 9 Seam, 4 ft. 10 in. thick.
PO—Sturgis. Ky. SP—Same CTY—Union; RR—Ill. Cent., Evansville Br.
MS—H. M. Ernst, ... Sturgis, Ky.
S of H—Mules, rope and 1 Elec loco.; track gauge 40 in.
S of M—9 elec. mach.
PP—5 C. J. Walton return tubular boilers, total 750 H. P., 2 gen. units, 500 volts D. C., 2 pumps, 2 hoisting engine and 1 fan engine.
EMP—175. Last fiscal year output 204,829 tons.

WHITE STAR COAL COMPANY
General Office, Pineville, Ky.
Drift Mine; Wallins Creek Seam; 84 to 108 in. thick.
PO—White Star, Ky.; SP—Same; CTY—Harlan; RR—L. & N., Harlan Br.
PR—W. L. Moss........Pineville, Ky.
TR—M. J. Moss " "
GM—R. B. Moss,.....White Star, Ky.
GS—Saul Booze " "
PA—W. H. Simpson, " "
EM—O. B. Culton......Pineville, Ky.
MM—L. P. Scholl.....White Star, Ky.
EE—J. I. Stone, " "
SM—W. H. Simpson " "
S of H—Mules, 2 elec. locos., 1 steam loco. Track gauge, 48 in.
S of M—5 elec. mach.
PP—Purchase power.
EMP—150.

WILLIAMS COAL CO.
See Beaver Dam Coal Co.

WILSON BERGER COAL CO.
General Office, Harlan, Ky.
Wilson Berger Coal Co. Mine; Drift; Harlan and Wallins Creek Seams; 54 to 108 in. thick.
PO—Grays Knob, Ky.; SP—Harlan, Ky.: CTY—Harlan; RR—L. & N.
PR—C. E. Wilson......Crewe, W. Va.
TR—T. C. Berger, ...Chattaroy, W. Va.
GM—S. V. Preston,....Grays Knob, Ky.
PA—S. V. Preston, " "
EM—R. W. Mercer, " "
SM—R. L. Anderson...Grays Knob, Ky.
S of H—4 elec. locos. Track gauge 48 in.
S of M—Elec. mach.
PP—Purchase power.

WILSON, MRS. JAMES.
Bon Harbor Mine, Drift, 4½ to 5½ ft. thick.
PO—Owensboro, Ky. SP—Mattingly, Ky. CTY—Daviess. RR—L. H. & St. L.
PR—Mrs. James Wilson, Owensboro, Ky.
TR—Mrs. James Wilson, " "
GM—Mrs. James Wilson, " "
GS—Jas. Goodwin, " "
S of H—Mules. Track gauge 40 in.
S of M—Hand.
PP—1 pump.
EMP—9. Last fiscal year output 8,026 tons.

WINONA COAL & COKE CO.
General Office, Middlesboro, Ky.
Winona Mine; Drift; Winona Seam; 60 to 65 in. thick. Operate Washery.
PO—Gravity, Ky. SP—Middlesboro, Ky. CTY—Bell. RR—L. & N., South.
PR—J. L. Manring, Middlesboro, Ky.
GM—J. L. Manring, " "
TR—F. E. Hess, " "
CE—J. C. Richardson, " "
MS—E. R. Short, " "
SM—Robert Lyons, " "
S of H—1 elec. loco. Track gauge 36 in.
S of M—Hand.
PP—2300 volts A. C., and 250 volts D. C., 3 phase, 60 cycle, 2 pumps. Power purchased.
EMP—125. Last fiscal year output 6,300 tons.

WISCONSIN STEEL CO.
General Office, Harvester Bldg., Chicago, Ill.
"C" and "D" Mines; Drifts Seams 49 to 100 in. thick.
PO—Benham, Ky. SP—Same. CTY—Harlan. RR—L. & N., W. & B. M. Branch.
PR—H.F. Perkins, ... Chicago, Ill.
VP—C. F. Biggert, " "
TR—W. M. Gale, " "
GS—W. C. Tucker, ... Benham, Ky.
PA—W. C. Tucker, " "
EM—T. C. Miller, " "
MM—W. F. Nanstiel, " "
Asst MS—R. R. Shellenger, " "
SCO—Benham Store, " "
SM—A. D. Van Gorder, " "
S of H—12 Elec. loco.; track gauge 44 in.
S of M—13 Elec. mach.
PP—4 Sterling water tube boilers, total 1,400 H. P., 3 gen. units, 250 volts D. C., and 1 pump.
EMP—542. 408 Bee Hive coke ovens. Last fiscal year output, 275,000 tons.

YELLOW CREEK COAL CO.
Yellow Creek Mine, Drift, 4½ ft. thick. Operate washery.
PO—Bosworth, Ky. SP—Middlesboro, Ky. CTY—Bell. RR—L. & N. and Southern Rys., Middleboro RR.
PR—J. G. Fitzpatrick.Middlesboro, Ky.
TR—E.S. Helburn, " "
GM—A.H. Rennebaum, " "
PA—J.E. Evans, " "
MS—L. F. Rennebaum....Bosworth, Ky.
SM—Joe F. Bosworth, Jr., " "
EM—J. C. Richardson, Middlesboro, "
S of H—4 elec. locos.
S of M—4 elec. machines.
PP—4 return tubular boilers, total 1,000 H. P., 500 volts.
EMP—250. Last fiscal year output 100,000 tons. Sales agent, E. S. Helburn.

ZION COAL CO.
Zion Mine, Shaft, No. 9 Seam, 3 ft. 10 in. thick.
PO—Henderson, Ky. R.F.D. No. 4. CTY—Henderson.
PR—H.E. Mitchell,
Henderson, Ky. R.F.D.4
TR—C.A. Moss, Jr., " "
GM—H. E. Mitchell, " "
PA—H. E. Mitchell, " "
S of H—Mules. Track gauge 2 ft. 3 in.
S of M—Hand, and 1 comp. air mach.
PP—2 return tubular boilers, total 100 H. P., 1 air comp. and 1 pump.
EMP—10. Last fiscal year output 3,200 tons.

MARYLAND

For List of Abbreviations See Page 622.

BARTON COAL MINING CO., Inc.
General Office, 17 Battery Place, N. Y.
Masco Mine; Drift; Lower Freeport Seam; 42 to 54 in. thick.
PO—Westernport, Md. SP—Barton, Md.; CTY—Alleghany; RR—C. & P., Main Line.
PR—W. F. Jacoby......New York, N.Y.
PA—W. F. Jacoby, " "
S of H—Mules.
S of M—Hand.
EMP—50. Last fiscal year output 25,000 tons.

CHAFFEE COAL CO.
General Office, Real Estate Trust Bldg., Philadelphia, Pa.
Chaffee Mine, Drift, Lower Kittanning Seam, 50 in. to 60 in. thick.
PO—Chaffee, W. Va. SP—Same. CTY—Mineral. RR—Western Maryland.
PR—P. J. Baral,.. Philadelphia, Pa.
TR—P. M. Satterthwaite, " "
GM—Howard D. Pfeiffer....Phila., Pa.
PA—Howard D. Pfeiffer, " "
GS—S. Stottlemeyer, Chaffee, W. Va.
SCO—Three Forks Supply Co., buyer, A. G. Paugh, Chaffee, W. Va.
S of H—Mules, rope and 2 gasoline locos Track gauge 42 in.
S of M—Hand.
PP—150 H.P. return tubular boilers. Present basis 150,000 tons.

CHAPMAN COAL MINING CO.
General Office, Baltimore, Md.
Swanton Mine, Drift, Bakerstown Seam 32 to 36 in. thick.
PO—Barton, Md. SP—Same. CTY—Allegany. RR—Cumberland & Penna.
PR—W. J. Chapman, ..Baltimore, Md.
GM—W. J. Chapman, " "
TR—G. W. Chapman, " "
PA—G. W. Chapman, " "
MS—John D. Frenzel, ..Barton, "
S of H—Mules. Track gauge 42 in.
S of M—Hand.
EMP—100. Last fiscal year output 50,000 tons.
(Old information.)

CONSOLIDATION COAL CO. (THE)
General Office, Continental Building, Baltimore, Md.
101 Mines in Md., West Va., Pa., and Ky.
Chairman of Board, C. W. Watson, Baltimore, Md.
PR—J. H. Wheelwright, " "
Secy—T. K. Stuart, " "
Mgr. of Trans—W. L. Andrews," "
Genl. Auditor—A. S. Dunham," "
VP—F. S. Landstreet. Bankers Trust Bldg., New York, N. Y.
VP—Geo. T. Watson..Fairmont, W. Va.
TR—S. L. Watson, " "
GM—F. R. Lyon, " "
Asst GM—Brooks Fleming, Jr., Fairmont, W. Va.
PA—A. T. Watson, " "
PA—Asst., F. C. Davis, " "
CE—Frank Haas, " "
CE—Asst., J. C. Gaskill, " "
Chief Engineer, All Divisions—John G. Smyth ....Fairmont, W. Va.
Supt. P. & M. Dept.—R. L. Kingsland, Fairmont, W. Va.
Eng. of Tests—R. E. Rightmire, Fairmont, W. Va.
Live Stock Buyer—Frank Amos, Fairmont, W. Va.
Genl. Mgr. of Sales—F. W. Wilshire, Bankers Trust Bldg., New York, N.Y.
Western Mgr. of Sales—E. M. Mancourt, Fisher Bldg., Chicago, Ill.

MGR of Md. Div.—H. V. Hesse, ... Frostburg, Md.
CE—Md. Div., R. A. Walter, " "
MM—Md. Div., C. E. Tucker, " "
Sales Agent, F W. Wilshire, New York, N Y

Consolidation No. 1 Mine, Slope, Pgh. Seam, 7 ft. 3 in. to 10 ft. 9 in. thick.
PO—Ocean, Md. SP—Same. CTY—Allegany. RR—Cumb. & Penna., Main Line.
MS—Christopher Roberts....Ocean, Md.
S of H—7 comp. air locos, mules and rope. Track gauge 36 in.
S of M—Hand.
PP—11 return tubular boilers, 2 gen. units, 1 250 volts, D. C., 1 2200 volts A.C., 60 cycles, single phase, 3 compressors, 19 pumps.
EMP—500. Last fiscal year output, 494,406 tons.

Consolidation No. 3 Mine, Slope and Drift, Pgh. or Big Vein Seam, 7.1 ft. to 9.8 ft. thick.
PO—Eckhart, R.F.D. Md. SP—Hoffman, Md. CTY—Allegany. RR—Cumb. & Penna., Eckhart Branch.
MS—J. R. Daniels.....Eckhart, Md.
S of H—Mule, 6 comp. air locos. and rope. Track gauge 3 ft.
S of M—Hand.
PP—14 return tubular boilers, 3 gen. units, 125 volts, D.C., 4 comp. 10 pumps to drain tunnel.
EMP—597. Last fiscal year output 350,503 tons.

Consolidation No. 4 Mine, Slope, Pgh. or Big Seam, 6 ft. to 10 ft. thick.
PO—Eckhart, Md. SP—Same. CTY—Allegany. RR—Cumb. & Penna., Eckhart Branch.
MS—Hugo Rempel........Eckhart, Md.
S of H—Mule, 1 elec. loco. and rope. Track gauge 3 ft.
S of M—Hand.
PP—3 return tubular boilers, 1 gen. unit, 250 volts D.C., 8 pumps to drainage tunnel.
EMP—119. Last fiscal year output 98,506 tons.

Consolidation No. 7 Mine, Drift and Slope, Pgh. or Big Seam, 6.1 to 10.4 ft. thick.
PO—Lord, Md. SP—Same. CTY—Allegany. RR—Cumb. & Penna, No. 7 Branch.
MS—Benjamin Bradley, .. Lord, Md.
S of H—Mule and rope. Track gauge 3 ft.
S of M—Hand.
PP—9 return tubular boilers, 3 gen. units, 115 volts D. C., 2 air comp., 7 pumps to drainage tunnel.
EMP—421. Last fiscal year output, 270,370 tons.

Consolidation No. 8 Mine, drift and Slope, Pgh. or Big Seam, 5.7 ft. to 8.8 ft. thick.
PO—Midland, Md. SP—Same. CTY—Allegany. RR—Cumb. & Penna., Main Line.
MS—R. L. Edwards......Midland, Md.
S of H—Mule and rope. Track gauge 3 ft.
S of M—Hand.
PP—1 return tubular boiler.
EMP—138. Last fiscal year output, 122,627 tons.

Consolidation No. 9 Mine, Drift, Sewickley or Tyson Seam, 2.4 ft. to 3.7 ft. thick.
PO—Frostburg, Md. SP—No. 9 Station, Frostburg, Md. CTY—Allegany. RR—Cumb. & Penna., Main Line.
MS—W. A. Woddy......Frostburg, Md.
S of H—Mules and 2 elec. locos. Track gauge 42 in.
S of M—Hand and 2 elec. machines.
PP—2 return tubular boilers, 2 gen. units, 250 volts D.C., 10 pumps.
EMP—207. Last fiscal year output, 187,697 tons.

Consolidation No. 10 Mine, Drift, Sewickley or Tyson Seam, 2.7 ft. to 4 ft. thick.
PO—Eckhart, Md. SP—Same. CTY—Allegany. RR—Cumb. & Penna., Eckhart Branch.
MS—Frank Myers, ... Eckhart, Md.
S of H—Mules and 1 elec. loco.
S of M—Hand.
PP—5 pumps, power from No. 4 Mine.
EMP—112. Last fiscal year output, 89,051 tons.

Consolidation No. 11 Mine, Shaft, Sewickley or Tyson Seam, 2.7 ft. to 3.5 ft. thick.
PO—Frostburg, Md. SP—Same. CTY—Allegany. RR—Cumb. & Penna.
MS—Eugene Layman, .. Frostburg, Md.
S of H—Mule and 1 elec. loco. Track gauge 3½ ft.
S of M—Hand.
PP—4 pumps to drain tunnel. Power from No. 3 Mine.
EMP—103. Last fiscal year output, 64,155 tons.

Consolidation No. 12 Mine, Shaft, Pgh. or Big Seam, 6 ft. to 10.6 ft. thick.
PO—Shaft, Md. SP—Borden Shaft, Md. CTY—Allegany. RR—Cumb. & Penna.
MS—Alex C. Neal, ... Frostburg, Md.
S of H—Mule, 4 comp. air locos. and rope. Track gauge 3 ft.
S of M—Hand.
PP—2 return tubular boilers, 1 gen. unit, 125 volts D.C., 2 air comp. 5 pumps to drainage tunnel.
EMP—292. Last fiscal year output, 291,155 tons.

Consolidation No. 13 Mine, Drift and Slope, Pgh. or Big Seam, 7.3 to 9.2 thick.
PO—Frostburg, Md. SP—Consolidation No. 13. CTY—Allegany. RR—Cumb. & Penna.
MS—John Bahen, ... Frostburg, Md.
S of H—Mule and rope. Track gauge 3 ft.
S of M—Hand.
PP—1 Return tubular boiler.
EMP—60. Last fiscal year output, 51,245 tons.

GEORGE'S CREEK COAL COMPANY.
George's Creek Mines, Sections No. 1, 2, 3, and 4, Drift, Pgh. or "Big Seam," 9 to 11 ft. thick.
PO—Lonaconing, Md. SP—Same. CTY—Allegany. RR—Western Md., G. C. & C. Div.
PR—H. E. Weber,....Cumberland, Md.
TR—Robt. L. Stallings, " "
GM—W. F. Coale, " "
MS—J. R. Hamilton, Lonaconing, "
PA—J. R. Hamilton, " "
MM—Theo. Hardegen, " "
S of H—3 elec. locos. Track gauge 42 in.
S of M—Hand.
PP—Motor generator set. 1—200 K. W. at Mine No. 3, and 1—500 K. W. at Mine No. 4. Purchase power.
EMP—380. Last fiscal year output 200,900 tons. Sales agent, W. F. Coale, Cumberland, Md.

JORDAN, S. H.
General Office, Keyser, W. Va.
Cottage Street Mine, Drift, Freeport Seam, 4 to 7 ft. thick.
PO—Bayard, W. Va. SP—Same. CTY—Grant. RR—W. M. Ry.
GM—S. H. Jordan, ...Keyser, W. Va.
PA—S. H. Jordan, " "
GS—J. T. Jordan, ... Bayard, "
S of H—Mules. Track gauge 36 in.
S of M—Pick.
EMP—25. Last fiscal year output 7,840 tons.

KENDALL LUMBER CO.
General Office, Oliver Bldg., Pgh., Pa.
Arnold Run Mine; Drift; B or Miller Seam, 48 to 54 in. thick.
PO—Crellin, Md.; SP—Hutton, Md.; CTY—Garrett. RR—B. & O., Preston Branch.
PR—J. L. Kendall....Pittsburgh, Pa.
TR—W. F. Schatz, " "
GM—S. A. Kendall......Crellin, Md.
GS—Chas. W. Ream, " "
SM—H. K. Friend, " "
SCO—Kendall Supply Co. Buyer, H. K. Friend, Crellin, Md.
S of H—Mules; track gauge 36 in.
S of M—Hand.
EMP—16. Output 25,000 tons.

MARYLAND COAL CO.
Kingsland Mine; Drift, Tyson Seam.
PO—Lonaconing, Md.; SP—Same; CTY—Alleghany, RR—George's Creek & Cumb.
PR—J. W. Galloway, No. 1 Broadway, N. Y.
GM—J. W. Galloway, No. 1 Broadway, N. Y.
TR—Jas T Russell, No.. 1 Broadway, N. Y.
EE—John Hardigan....Lanaconing, Md.
MS—Elkins Read, " "
S of H—Mules and 2 elec. locos., track gauge 42 in.
S of M—Hand.
PP—2 boilers, 200 K. W. M. G. set 250 volts, D. C. and 2 elec. pumps. Power purchased.
EMP—175. Last fiscal year output 50,000 tons.

MARYLAND & GEORGE'S CREEK COAL CO.
Mertens Mine, Slope and Drift.
PO—Cumberland, Md. SP—Vale Summit, Md. CTY—Allegany. RR—G. C. & C.
GM—E. D. Baker......Cumberland, Md.
PA—E. D. Baker, " "
EM—J. V. Maguiniss, " "
MS—John Stepp. " "
S of H—Gasoline and elec. locos.
S of M—Elec. mach. and hand.
PP—4 boilers, total 600 H. P., gen. unit, 500 volts D. C.
(Old information.)

MIDLAND MINING CO.
General Office, Cumberland, Md.
Neff Run and Enterprise Mines, Seams, 14 ft. thick.

PO—Midland, Md. SP—Same. CTY—Allegany. RR—C. & P. RR.
PR—J. W. P. Somerville, Cumberland Md
GM—J. W. P. Somerville, " "
PA—J. W. P. Somerville, " "
TR—W. A. S. Somerville, " "
ME—Wm. Harvey, ... Frostburg, Md.
S of H—Horses. Track gauge 36 in.
S of M—Hand.
EMP—75. Last fiscal year output 65,000 tons.

MILLER & GREENE COAL COMPANY
General Office, Westernport, Md.
M. & G. No. 1 Mine; Drift; Parker Seam; 34 to 42 in. thick.
PO—Westernport, Md.; SP—Franklin, Md.; CTY—Allegany; RR—C. & P.
PR—J. P. Miller......Westernport, Md.
TR—J. P. Miller, " "
GM—J. O. P. Greene, " "
PA—J. O. P. Greene, " "
GS—A. L. Frenzell........Barton, Md.
CE—Wm. Harvey........Frostburg, Md.
EM—Wm. Harvey " "
S of H—Mules. Track gauge 42 in.
S of M—Hand.
PP—1 boiler.
EMP—30. Sales Mgr., J. J. Greene.

MONROE COAL MINING CO.
Elk Run Nos. 1 and 3 Mines, Drift, "Lower Kittanning Seam," 2 to 6 ft. thick..
PO—Barnum, W. Va. SP—Same. CTY—Mineral. RR—Western Md.
PR—Chas. M. Dodson, Bethlehem, Pa.
TR—Josiah Bachman, " "
PA—G. C. Macfarlane, Barnum, W.Va.
MS—G. C. Macfarlane, " "
SM—E. H. Kight, " "
S of H—Mules and 1 gasoline loco. Track gauge 42 in.
S of M—Hand.
PP—2 return tubular boilers, total 250 H.P., 1 air comp.
EMP—150. Last fiscal year output 38,000 tons. Sales agent, Weston Dodson & Co., Inc., Bethlehem, Pa.

MOSCOW-GEORGE'S CREEK MNG. CO.
General Office, Cumberland, Md.
Moscow Nos. 2 and 3 Mines, Drift, George's Creek Big Vein and Bakerstown Seams, 4 to 14 ft. thick.
PO—Barton, Md. SP—Same. CTY—Allegany. RR—C. & P.
PR—J. W. P. Somerville, Cumberland, Md.
PA—J. W. P. Somerville. " "
TR—W. A. S. Somerville, " "
GM—J. W. P. Somerville. " "
MS—E. R. Brennan, ...Barton, "
S of H—Horses and mules. Track gauge 42 in.
S of M—Hand.
EMP—48. Last fiscal year. output 43,000 tons.

NEW CENTRAL COAL CO.
General Office, 17 Battery Place, New York City, N. Y.
No. 1 Koontz and No. 2 Big Vein Mines, Drifts, Sewickley Seam, 3 ft. 8 in. to 3 ft. 4 in. thick.
PO—Lonaconing, Md. SP—Same. CTY—Allegany. RR—Western Maryland, George's Creek & Cumberland.
PR—M. Baxter. Jr.... New York City
TR—Frank W. Cumminsky, " "
GS—Duncan Sinclair, Fairmont, W. Va.
PA—Alexander Adams, Lonaconing, Md
MS—Alexander Adams..Lonaconing, Md.
S of H—Mules and rope. Track gauge 42 in.
S of M—Hand.
PP—2 return tubular boilers, total 160 H. P.
EMP—210. Last fiscal year output 301,226 tons

NEW YORK MINING CO.
General Office, Mt. Savage, Md.
PR—H. Crawford Black, Baltimore Md.
TR—V. L. Black, " "
GS—James Aldom....Mt. Savage, Md.
PA—H. L. Aldridge, " "
EM—R. E. Wilson, " "
MM—Thos. Hill........Frostburg, Md.
EE—Thos. Hill........Frostburg, Md.
Sales agency, Black, Sheridan & Wilson Co., Baltimore, Md.

Union No. 1 Mine, Drift, Pgh. Seam, 4½ to 8 ft. thick.
PO—Mt. Savage, Md. SP—Allegany. Md.; RR—W. & M., Cumb. & Penna. RR—W M., Cumb. & Penna.
MS—James Aldom....Mt. Savage, Md.
S of H—2 Elec. locos, 2 storage batteries. Track gauge 48 in.
S of M—2 elec. mach.

Union No. 2 Mine, Drift, Pgh. Seam, 4½ to 6 ft. thick.

(Continued on Next Page.)

New York Mining Co.—Cont.
PO—Allegany, Md.; SP—Same; CTY—Allegany. RR—Cumberland & Penna.
MS—James Aldom......Mt. Savage, Md.
S of H—1 elec. loco. Track gauge 48 in.
S of M—Hand.
PP—3 Erie City return tubular boilers, total 450 H. P., 1 gen. unit, 250 volts D. C.

PATTISON, G. C.
Drift Mine, Seam K.
PO—Bloomington, Md. SP—Same CTY—Garrett. RR—B. & O.
PR—G. C. Pattison, Bloomington, Md.
GS—Carroll Pattison, " "
S of H—Mules. Track gauge, 42 in.
S of M—Hand.
PP—1 return tubular boiler, 20 H.P.
EMP—50.

PHOENIX & GEORGE'S CREEK MNG. CO.
General Office, Stephen Girard Bldg., Philadelphia, Pa.
Elkhart Mine, Drift, Bakerstown or Barton Seam, 30 to 48 in. thick.
PO—Piedmont, W. Va. SP—Same. CTY—Allegany. RR—C. & P.
PR—W. D. Althouse,.... Phila., Pa.
TR—W.D. Althouse, " "
PA—W.D. Althouse, " "
MS—John Rankin, Piedmont, W. Va.
EM—Wm. Harvey, .. Frostburg, Md.
S of H—Mules and storage battery motor. Track gauge 42 in.
S of M—Hand.

PIEDMONT & GEORGE'S CREEK COAL CO.
General Office, Frostburg, Md.
PR—John S. Brophy,.. Frostburg, Md.
GM—John S. Brophy, " "
GS—John S. Brophy, " "
TR—Martin Condry " "
PA—Alex. G. Close, " "
EM—George G. Townsend, " "
Sales agent, S. J. Bohannon, 30 Church St., New York, N. Y.

Washington Mine No. 2, Drift, Up. Sewickley Seam, 38 to 46 in. thick.
PO—Eckhart, Md. SP—Same. CTY—Allegany. RR—C. & P., Eckhart Branch.
EE—Harvey Hileman....Frostburg, Md.
MS—Martin Condry, ..Frostburg, Md.
S of H—6 elec. loco. Track gauge 42 in.
S of M—Hand.
PP—2 Atlas return tubular boilers, total 350 H. P., gen. unit, 250 volts, D. C. 1 pump.
EMP—147. Last fiscal year output 96,219.09 tons.

Washington Mines Nos. 3 and 5, Drift, Kittanning and Bakerstown Seams 42-72 in. thick; RR—C. & P.
PO—Westernport, Md. SP—Gannon's Station, Md. CTY—Allegany.
EE—Wm. Griffith,.. Westernport, Md.
MS—Wm. E. Brown " "
S of H—3 elec, 1 gasoline loco. Track gauge 42 in.
S of M—5 elec. mach. and hand.
PP—1 Keeler, 2 Atlas return tubular boilers, total 350 H. P., gen. unit 250 D.C., 1 pump.
EMP—214. Last fiscal year output 123,741 tons.

WAITMAN SMOKELESS COAL CO.
Steyer Mine; Drift; Kittanning Seam; 72 in. thick.
PO—Steyer Md.; SP—Same; CTY—Garret; RR—W. M.
PR—O. D. Eastman......Chicago, Ill.
TR—W. T. Steyer,.......Steyer, Md.
GM—W. T. Steyer " "
PA—W. T. Steyer " "
S of H—Mules.
S of M—Hand.
EMP—5.
Successor to Branard Coal Co.

MICHIGAN

For List of Abbreviations See Page 622.

BANNER COAL COMPANY.
Banner Mine, Shaft, 30 in. thick.
PO—Saginaw, W. S. Mich, R.F.D. No. 3. SP—Swan Creek, Mich. CTY — Saginaw. RR — Michigan, Central.
PR—M. Jordan, ... Saginaw, Mich.
TR—W.B. Carmichael, " "
GM—W.B. Carmichael, " "
GS—W. A. Jones.......Saginaw, Mich.
PA—Wm. Jochen, " "
EM—Robert Nicols, " "
MM—George Taylor, " "
EE—Sam Lyons, " "
SCO—Address the company. Buyer, Wm. Jochen, Saginaw, Mich.
S of H—Mules. Track gauge 36 in.
S of M—Hand and 6 elec. mach.
PP—3 return tubular boilers, total 450 H. P.,, Erie. 1 generating unit, 250 volts, D.C., 2 pumps.
EMP—135. Last fiscal year output 59,325 tons. Sales agent W. B. Carmichael, 220 Gage St., Saginaw, Mich.

BEAVER COAL CO.
Beaver Mine, Shaft, Seam 3½ ft. thick.
PO—Bay City, Mich. SP—Same. CTY—Bay. RR—Mich. Central.
PR—Chas. Coryell, ..Bay City, Mich.
GM—Chas. Coryell, " "
GS—John Coryell, " "
TR—Jas. E. Davidson, " "
PA—Wm. Reed, " "
MS—Wm. Jones, " "
EE—Wm. Long, " "
ME—Wm. E. Evans, St. Charles, "
S of H—Mules. Track gauge 36 in.
S of M—9 Elec. Short Wall machs.
PP—3 Return Tubular boilers, total 450 H. P., 2 gen. units, 250 volts D.C., 2 pumps.
EMP—150. Last fiscal year output 120,000 tons.

BLISS COAL CO.
Bliss Mine, Shaft.
PO—Swan Creek, Mich. SP—Same. CTY—Saginaw. RR—M. C.
PR—J. F. Brand......Saginaw, Mich.
TR—C. H. Brand " "
GM—C. E. Linton, " "
PA—Wm. Reed, " "
MS—J. T. Phillips, " "
S of H—Mules. Track gauge 34 in.
S of M—8 Elec. mach.
PP—4 Boilers, total 320 H. P. gen. unit 250 volts, D. C.
EMP—150. Last fiscal year output, 84,554 tons.

CALEDONIA COAL CO., LTD.
No. 3 Caledonia Mine; Shaft; St Charles Seam, 14 in. thick.
PO—Saginaw, Mich.; SP—Same; CTY—Saginaw.
PR—H. Hawkins......Saginaw, Mich.
TR—W. Kleinebriel, " "
GM—John Dagan, " "
PA—John Dagan, " "
MS—John Dagan, " "
MM—Frank Kumeen ...Saginaw, Mich.
SCO—Address the Company, " "
S of H—1 Steam loco.
S of M—Hand.
PP—2 Return tubular boilers, total 90 H. P., 1 pump.
EMP—90. Last fiscal year output, 39,806 tons.

CONSOLIDATED COAL CO.
General Office, Saginaw, Mich.
PR—W. J. Wickes......Saginaw, Mich.
TR—Otto Schupp, " "
GM—Robt. M. Randall, Saginaw, Mich.
SECY—C. W. Stiver, " "
PA—C. W. Stiver,
GS—Bert Russell, " "
MM—Bert Russell, " "
EM—Alexander Liddle, " "
EE—C. H. Lane, " "
SM—C. W. Stiver, " "

P. M. No. 3 Mine, Shaft, Saginaw Seam.
PO—Saginaw, Mich. SP—Same. CTY—Saginaw. RR—P. M., M. C.
MS—Robert Johnson....Saginaw, Mich.
S of H—Elec. loco.
S of M—6 Jeffrey short wall machs.
PP—elec.
EMP—20.

Shiawasee Mine, Shaft, Saginaw Seam.
PO—Saginaw, Mich. SP—Same. CTY Saginaw. RR—P.M., M.C.
MS—T. Westwood, .. Saginaw, Mich.
S of H—elec. loco.
S of M—7 Jeffrey short wall machs.
PP—elec.
EMP—240.

Wolverine No. 2 Mine, Shaft, Saginaw, Seam.
PO—Bay City, Mich. SP—Same. CTY—Saginaw. RR—P. M., M. C.
MS—A. McIllaney, .. Bay City, Mich.
S of H—elec. loco.
S of M—15 Goodman low vein chain machines.
PP—elec.
EMP—180.

Wolverine No. 3 Mine, Shaft, Saginaw Seam.
PO—Bay City, Mich. SP—Same. CTY—Bay. RR—P. M., M. C.
MS—W. F. Williams, Bay City, Mich.
S of H—Elec. loco.
S of M—15 comp. air punching mach.
EMP—370.

C. & F. No. 2 and Riverside No. 2 Mines, Shaft, Saginaw Seam.
PO—Saginaw, Mich SP—Same. CTY—Saginaw. RR—P. M., M. C.
MS—T. Hollis........Saginaw, Mich.

S of H—Elec. loco.
S of M—2 Jeffrey short wall mach.

DETROIT VITRIFIED BRICK CO.
Shaft Mine, Seam 1½ to 3½ ft. thick.
PO—Corunna, Mich. SP—Same. CTY—Shiawassee. RR—Grand Trunk.
PR—Frank Schmidt, .. Detroit, Mich
GM—Frank Schmidt, " "
TR—Frank Schmidt, " "
GS—W. J. Beaubien, ..Corunna, "
EM—W. J. Beaubien, " "
MS—Herbert Larragin, " "
MM—Chas Drain, " "
S of H—Mules. Track gauge 30 in.
S of M—Hand and comp. air machs.
PP—1 Nagle, 1 Houston, Stamwood & Gamble return tubular boilers, total 250 H. P., 3 engines, 1 air comp., 2 pumps.

GAGE, ROBERT, COAL CO.
PR—Robert Gage, ... Bay City, Mich.
TR—F. W. Urch, " "
SECY—F. T. Woodworth, " "
GM—Chas. Coryell, " "
PA—Wm. Reed, " "
GS—John Coryell, " "
EM—Wm. Evans, ...St. Charles, "
EE—J. A. Long.....St. Charles, Mich.

No. 2 Mine; Shaft; 36 ins. thick.
PO—St. Charles, Mich.; SP—Same; CTY—Saginaw; RR—Mich. Central.
MS—Richard Jenkins..St. Charles, Mich.
S of H—2 elec. loco.
S of M—Hand and elec. mach.
PP—4 return tubular boilers.
EMP—230. Last fiscal year output 132,137 tons.

No. 6 Mine; Shaft; 40 in. thick.
PO—Coryell; SP—Same; CTY—Bray; RR—M. C.
MS—John Coryell.......Coryell, Mich.
S of M—Hand
PP—4 return tubular boilers. Purchase power.
EMP—268. Last fiscal year output 250,718 tons.

HANDY BROS. MINING COMPANY.
General Office, Bay City, Mich.
Akron Mine, No. 2 Shaft.
PO—Akron, Mich. CTY—Tuscola. RR—Detroit, Bay City & Western.
GM—Chas. W. Handy....Bay City, Mich.
MS—Dan Morris........Akron, Mich.
S of H—elec. loco.
S of M—Hand and elec. machines.

JENKINS, T. M.
Cedar River Mine, Shaft, Seam 28 in. thick.
PO—Williamston, Mich. SP—Same. CTY—Ingham. RR—Pere Marquette.
GM—T. M. Jenkins, Williamston, Mich.
PA—T. M. Jenkins, " "
S of H—Mules. Track gauge 27 in.
S of M—Hand.
PP—2 pumps, boiler 60 H. P.
EMP—5. Last fiscal year output 1,280 tons.
Mine nearly worked out.

McAVOY COAL CO.
Owosso, Mich. No report.

MICHIGAN VITRIFIED BRICK CO.
Valley Mine, Drift.
PO—Bay City, Mich.; SP—Same; CTY—Bay; RR—Mich., Central.
PR—Charles Stiver......Saginaw, Mich.
PA—Fred L. Twining, " "
GM—Fred. L. Twining, " "
S of H—Mules.
S of M—Comp. air mach.
PP—2 Boilers, total 250 H. P., 1 compressor and 1 pump.
EMP—30. Coke ovens, 2 Bee Hive, 4 Rectangular. Consume coal in brick plant.
Note—In process of dissolution. Will reorganize later.

SAVAGE COAL CO.
General Office, Saginaw, Mich.
Verne Mine, Shaft, Seam 3 to 3½ ft. thick.
PO—Burt, Mich. SP—Same. CTY—Saginaw. RR—G. T.
PR—Kent Hess, ... Saginaw, Mich.
TR—Edw. Savage, " "
GM—Ed. Savage, " "
EM—Wm. Shoskey, ... Burt, "
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—1 return tubular boiler, total 60 H.P., 1 gen. unit, 1 pump.
EMP—5. Last fiscal year output 1,800 tons.
Note—Idle at present. Expect to resume soon.

WHAT CHEER COAL MINING CO.
PR—Walter I. Foss.....Bay City, Mich.
TR—Walter I. Foss, " "
GS—A. Jeffrey...........Flint, Mich.
PA—A. N. Fancher.....Bay City, Mich.
EM—Geo. MacPhail, " "
EE—Wm. Brunner....Bay City, Mich.
Sales agent, A. N. Fancher, " "

What Cheer No. 1 Mine, Shaft, Seam 30 in. to 4 ft. thick.
PO—Munger, Mich. SP—So. Bay City, Mich. CTY—Bay. RR—P. M.
MS—Alex. Jeffrey......Bay City, Mich.
SM—John Gingrich......Munger, Mich.
S of H—Mules and 3 Morgan Gardner elec. locos. Track gauge 40 in.
S of M—Hand and 13 elec. machs.
PP—5 return tubular boilers, total 500 H.P., 2 gen. units, 250 volts D. C., 1 pump.
EMP—200. Last fiscal year output 100,000 tons.

What Cheer No. 2 Mine, Shaft, Seam 30 in. to 4 ft. thick.
PO—Flint, Mich. SP—Same. CTY—Genessee. RR—Grand Trunk.
MS—W. F. Follis.........Flint, Mich.
SM—Geo. E. Hunt, " "
S of H—Mules. Track gauge 40 in.
S of M—Elec. machines.
PP—3 return tubular boilers, total 300 H. P., 1 gen. unit, 250 volts D.C., 5 pumps.
EMP—75. This mine just being opened.

MISSOURI

For List of Abbreviations See Page 622.

AULL, EDWARD COAL CO.
Slope Mine; 18 to 22 in. thick.
PO—Lexington, Mo; SP—Same CTY—Lafayette RR—Mo. Pacific, Sedalia Branch.
PR—Edward Aull, ...Lexington, Mo.
GM—Edward Aull, " "
TR—Seth O. Suat, " "
S of H—Mules.
S of M—Hand.
PP—3 phase, 60 cycles, 3 pumps Purchase power.

ANACONDA COAL CO.
Anaconda Mine; Shaft; Bituminous Seam, 30 to 36 in. thick.
PO—Clinton, Mo.; SP—Deepwater, Mo.; CTY—Henry; RR—Frisco, K. C. C., and Springfield br.
GM—H. T. Demaree......Clinton, Mo.
PA—H. T. Demaree, " "
S of H—Mules; track gauge 32 in.
S of M—Hand.

ARCTIC COAL & MINING CO.
No. 1 Mine; Shaft; Seam 40 in. thick
PO—Novinger, Mo. SP—Same. CTY—Adair. RR—Q. O. & K. C.
PR—Tony Rondretto, .. Novinger, Mo.
TR—Ben Pigotti, " "
PA—Elmer Sinex, " "
MS—Elmer Sinex, " "
EM—A. Rodkin, " "
S of H—Mules.. Track gauge 28 in
S of M—Hand.
PP—1 boiler, total 80 H. P., 1 pump.
EMP—19. Last fiscal year output 16,760 tons.

BARTON RIDGE COAL COMPANY
General Office, Pittsburg, Kansas.
No. 1 Mine; Stripping 24 to 30 in. thick.
PO—Liberal, Mo.; SP—Same; CTY—Barton; RR—Frisco.
PR—C. W. Waterman, Pittsburg, Kansas
GM—C. W. Waterman, " "
GS—C. W. Waterman, " "
PA—C. W. Waterman, " "
TR—A. F. Derny, " "
MS—Geo. Higgins........Liberal, Mo.
S of H—Mules.
S of M—Hand.
PP—2 return tubular boilers, total 215 H. P.

BATES COAL MINING & MERC. CO.
PO—Rich Hill, Mo., CTY—Bates; RR—Mo. Pac.
PR—G. I. Lynch..........Butler, Mo.
VP—S. W. Barr..........Butler, Mo.
PA—S. W. Barr. " "
TR—Homer Humphrey....Rich Hill, Mo.
MS—Z. Bellier, " "

BEALL, W. T.
Shaft Mine; Seam 57 in. thick.
PO—Prairie Hill, Mo.; CTY—Chariton.
PR—W. T. Beall....Prairie Hill, Mo.
GM—L. W. Fawks, " " "
PA—L. W. Fawks, " " "
MS—L. W. Fawks, " " "
S of M—Hand.
PP—1 Water tube boiler, 1 engine and 1 pump. Power purchased.
Last fiscal year output, 2,000 tons.

BELT COAL CO.
Higginsville, Mo. No report.

BELT LINE COAL & MINING CO.
No. 7 Mine; Shaft; Richmond Vein Seam; 19 to 40 in. thick.
PO—Camden, Mo.; SP—Same; CTY—Ray; RR—Wabash & Santa Fe.
PR—C. G. Hubbell, Camden, Mo.
TR—C H. Hubbell, Camden, Mo
GM—C. H. Hubbell, Camden, Mo.
PA—C. H. Hubbell, Camden, Mo
SCO—Martin & Hubbell, buyer; Edward Vail, Camden, Mo.
S. of H—Mules.
S of M—Hand.
EMP—115. Last fiscal year output, 30,512 ton.
NOTE—Successors to Martin, Hubbell, Osborne Coal Co.

BIG CREEK COAL CO.
No. 1 Mine; Shaft; Bevier Seam, 42 in. thick.
PO—Kirksville, Mo.; SP—Same; CTY—Adair; RR—Wab., Q. O. & K. C.
PR—G. W. Hartsock ......Albia, Iowa
GM—J. R. Brown......Kirksville, Mo.
GS—J. R. Brown " "
CE—J. R. Brown " "
TR—J. R. Brown, " "
PA—J. R. Brown, " "
SM—J. R. Brown, " "
MS—A. Steen, " "
S of H—Steam loco. and mules; track gauge, 36 in.
S of M—Hand.
PP—Boiler, 100 H. P., will install 2 gen. unit, 220 volts A. C., 3 phase, 60 cycles.
New operation.
Successors to the Kirksville Mercantile Mining & Fuel Co., and leased the mine of the Adair Brick Coal Mining & Cons. Co.

BOEDEKER COAL CO.
Boedeker Mine; Slope; Bituminous Seam; 18 in. thick.
PO—Higginsville, Mo. SP—Same. CTY—Lafayette; RR—C. & A. and Mo. Pac.
PR—E. H. Boedeker....Higginsville, Mo.
GM—F. C. Boedeker, " "
MS—F. C. Boedeker, " "
S of H—Mules. Track gauge 27 in.
S of M—Hand.
PP—1 pump.
EMP—6. Last fiscal year output 1,694 tons.

BONANZA COAL CO.
Bonanza Mine, Shaft, Seam 16 to 20 in. thick.
PO—Higginsville, Mo. SP—Same. CTY Lafayette. RR—C. & A
GM—S.W. Brandan, Higginsville, Mo.
PA—S.W. Brandan, " "
MS—W.F. Brandan, " "
S of H—Mules. Track gauge 27 in.
S of M—1 elec. mach.
PP—Volts, 220 A.C. and 250 D.C., 1 phase and 60 cycles, 2 pumps. Purchase power.
EMP—25. Last fiscal year output 3,008 tons. Sales agent H. Moore, 200 Grant Ave., Kansas City, Mo.

BOWEN COAL CO.
Mines Nos. 2 and 4, Shafts, Seam 5½ to 6 ft. thick.
PO—Windsor, Mo. SP — Bowen, Mo. CTY—Henry. RR—C.R.I.&P.
PR—Richard Bowen, ... Clinton, Mo.
TR—W. S. Bowen, ... Windsor, "
GM—John Bowen, " "
PA—John Bowen, " "
MS—Thos. R. Bowen, " "
MM—E. C. Easley, " "
S of H—Mules. Track gauge 32 in.
S of M—Hand.
PP—4 return tubular boilers, total 300 H.P., 5 pumps.
EMP—295. Last fiscal year output 115,000 tons. Sales agent, Star Coal Co., Kansas City, Mo.

BRADLEY COAL CO.
Shaft Mine; Seam 48 to 58 in. thick.
PO—Huntsville, Mo. SP—Moberly. CTY—Randolph. RR—Wabash and M. K. & T.
PR—D.L. Bradley, .. Huntsville, Mo.
GM—D.L. Bradley, " "
MS—D.L. Bradley, " "
SM—D. L. Bradley, " "
S of H—Mules. Track gauge 28 in.
S of M—Hand.
PP—1 boiler, total 16 H. P.
EMP—15. Last fiscal year output 3,426 tons.

BUCKLIN COAL CO.
Shaft Mine, Teha Seam, 32 in thick.
PO—Bucklin, Mo. SP—Same. CTY—Linn. RR—Santa Fe.
GM—O. B. Cantwell, .. Bucklin, Mo.
PA—O. B. Cantwell, " "
TR—G. H. Waldruff, " "
S of H—Elec. loco. and mules. Track gauge 34 in.
S of M—1 elec. mach.
PP—Return tubular boiler, 75 H.P., 1 gen. unit 220 volts D.C.
EMP—28.

BUNKER HILL COAL CO.
Bunker Hill Mine; Shaft; Seam 28 in. thick.
PO—Bucklin, Mo.; SP—Brookfield; CTY—Linn: RR—C. B. & Q
PR—Z. J. Banning.......Bucklin, Mo.
TR—J. Hamery..........Brookfield, Mo.
MS—W. M. Hamery......Bucklin, Mo.
GM—Z. J. Banning, " "
PA—Z. J. Banning. " "
EM—J. Daughtry, " "
S of H—Mules; track gauge, 26 in.
S of M—Hand.
PP—1 Boiler.
EMP—12.

CAINSVILLE COAL COMPANY.
Cainsville Mine; Shaft; 36 to 60 in. thick.
PO—Cainsville, Mo. SP—Same; CTY—Harrison; RR—C., B. & Q.
PR—D. W. Greene, Cainsville, Mo.
GM—D. W. Greene, Cainsville, Mo.
EM—D. W. Greene, Cainsville, Mo.
TR—R. G. Payne, Cainsville, Mo.
GS—Fred Rodgers, Cainsville, Mo.
MS—Fred Rodgers, Cainsville, Mo.
Sales Mgr.—R. G. Payne.
S of H—Mules; 2 elec. and 1 storage battery locos. Track gauge 42 in.
S of M—Hand.
PP—4 Atlas and 2 Coatesville return tubular boilers; total 900 H. P.; 250 volts D. C., 110 volts A. C., 3 phase, 60 cycles, 1 pump.
EMP—150 Last fiscal year output, 89,472 tons.
NOTE—Formerly Grand River Coal & Coke Co.

CARR COAL & MERC. CO.
Out of business.

CARSON A. & SON.
A. Carson & Son Mine; Shaft; 48 in. thick
PO—Huntsville, Mo; SP—Same; CTY—Randolph; RR—Wabash.
S of H—Steam Hoist.
S of M—Hand.
PP—1 boiler, 1 engine, total 52 H. P.
EMP—8. Output for 150 days, 2250 tons.

CENTRAL COAL & COKE CO.
General Office, Kansas City, Mo.
Three Mines in Missouri, 3 in Wyoming, 2 in Oklahoma, 7 in Arkansas, 9 in Kansas.
Nos. 24, 25 and 28 Mines, Slope and Shaft, Des Moines Seam.
PO—Bevier, Mo. SP—Same. CTY—Macon. RR—Mo. & La., Burlington.
PR—Charles S. Keith, Kansas City, Mo.
TR—E. E. Riley, " "
VP—Harry N. Taylor, " "
PA—Thos. Mackie, " "
SM—Thos. Mackie, " "
CE—J. O. Flaherty, " "
MS—A. W. Dickinson......Bevier, Mo.
S of H—Mules, rope and 2 gasoline locos.
S of M—Hand.
PP—10 boilers.
EMP—923.

CHEROKEE, GIRARD COAL CO.
General Office, Mindenmines, Mo.
No. 1 Mine; Stripping; Pittsburgh Vein 30 to 36 in. thick.
PO—Mindenmines, Mo.; SP—Same; CTY—Barton; RR—Mo. Pac., Fonda Spur branch.
PR—A. S. Hubert....Mindenmines, Mo.
GM—A. S. Hubert, " "
CE—A. S. Hubert, " "
MS—C. C. Martin. " "
TR—E. J. McFarland.....Girard, Kas.
S of H—1 elec. loco.
PP—4 water tube boilers, 3 pumps.
EMP—50. Last fiscal year output 55,000 tons.

CLARK COAL CO.
Shaft Mine.
PO—Perry, Mo.; SP—Same;CTY—Ralls; RR—St. L. & H.
PR—D. B. Fitzpatrick......Perry, Mo.
GM—D. B. Fitzpatrick, " "
TR—J. W. Fitzpatrick, " "
MS—John Ledford.
S of H—Mules.

COLLARD & SCHOLER
Shaft mine; 36 in. thick.
PO—Sprague, Mo.; SP—Same; CTY—Bates; RR—Frisco.
S of H—Mules.
PP—6 H. P. Gasoline Engine.

COLUMBIA COAL CO.
Columbia Mine; Shaft; Seam 36 to 44 in. thick.
PO—Columbia, Mo.; CTY—Boone.
PR—R. Cook...........Columbia, Mo.
GM—R. Cook, " "
PA—R. Cook. " "
S of H—Mules.
EMP—8. Last fiscal year output 3,000 tons.

COMMERCIAL COAL COMPANY.
General office, Novinger, Mo.
Mine No. 1; Shaft; No. 2 Seam; 36 to 42 in thick.
PO—Novinger, Mo; SP—Same; CTY—Adair; RR—Iowa and St. Louis.
TR—Alexander Nimmo, ..Novinger, Mo.
PA—Alexander Nimmo, " "
S of H—Mules.
S of M—Hand.
EMP—23. Last fical year output, 3000 ton.
Note—Operating mine formerly operated as Mine No. 1 by Kansas City Midland Coal & Mining Co.

CONNELSVILLE COAL & MINING CO.
Mine No. 1 Slope, Top Seam, 40 to 44 in.
PO—Connelsville, Mo. SP—Same. CTY Adair. RR—Iowa & St. Louis.
PR—G. W. Evans, .. Connelsville, Mo.
GM—G. W. Evans, " "
MS—G. W. Evans, " "
MM—A. Lanner, " "
TR—S. F. Shoop, " "
S of H—Mules. Track gauge 29½ in.
S of M—Hand.
PP—2 Wagner boilers, total, 50 H. P., 1 pump.
EMP—110. Last fiscal year output 62,130 tons. Sales agent, G. W. Evans, Connelsville, Mo.
(Old information.)

CRAWFORD, WILSON COAL CO.
Shaft Mine.
PO—Richmond, Mo. SP—Same. CTY—Ray. RR—A. T. & S. F.
S of H—Mules.
S of M—Hand.
EMP—75. State report.

CRESCENT COAL CO.
Crescent Mine; Shaft; 3rd or Mulky Seam, 42 to 48 in thick.
PO—Yates, Mo.; SP—Same; CTY—Randolph; RR—C. & A.
PR—Mike Bottino..........Yates, Mo.
GM—Mike Bottino, " "
TR—Chas. Bottino, " "
GS—Henry Welch, " "
PA—Henry Welch, " "
MS—Pete Bottino, " "
S of H—Mules.
S of M—Hand.
PP—1 Return tubular boiler (Elliston).
EMP—6. Last fiscal year output, 1,100 tons.

DAME & SON
Out of business.

DAVIS CREEK COAL CO.
Davis Creek Mine; Shaft; Seam 42 in. thick.
PO—Novinger, Mo.; SP—Same; CTY—Adair; RR—C. B. & Q., Q. O. and K. C.
PR—Emmet Corrigan.....Novinger, Mo.
TR—Emmet Corrigan, " "
GM—Emmet Corrigan, " "
PA—J. L. Rowland, " "
GS—John Barron, " "
MS—John Barron, " "
EM—J. F. Duncan, " "
EE—J. R. Scott, " "
CE—Geo. Smead, " "
S of H—1 Elec. loco.; track gauge 30 in.
S of M—5 elec. mach.
PP—3 return tubular boilers, total 375 H. P., 1 gen. unit, 250 volts D. C.
EMP—250. Last fiscal year output 82,983 tons.
Sales Agents, Midland Coal Co., Kansas City, Mo.
Successors to the Rombauer Coal Co.

DIAMOND COAL CO.
Wilson Mine, Shaft; Seam 18 to 24 in. thick.
PO—Corder, Mo. SP—Same. CTY—Lafayette. RR—C. & A.
PR—G. A. Frerking, ... Corder, Mo.
TR—Wm. M. Groves, " "
GM—K. P. Kramer, " "
PA—K. P. Kramer, " "
MS—K. P. Kramer, " "
S of H—Mules Track gauge 27 in.
S of M—Hand.
PP—2 boilers, total 75 H. P., 2 pumps.
EMP—90. Last fiscal year output 18,269 tons. Sales agent K. T. Kramer, Corder, Mo.

EAGLE COAL CO.
Shaft Mine; Seam 21 to 30 ins. thick.
PO—Vandalia, Mo.; SP—Same; CTY—Audrian; RR—C. & A.
PR—W. H. Hass........Vandalia, Mo.
TR—W. H. Haas, " "
SECY—Jennie Turnbull, " "
MS—Robert Trunbull, " "
S of M—Hand.
EMP—15. Last fiscal year output, 3,207 tons

EUREKA COAL, MINING & MERC. CO.
Eureka No. 1 Mine; Shaft; Bituminous Seam; 42 to 60 in. thick.
PO—Rich Hill, Mo. SP—Panama, Mo. CTY—Bates. RR—M. P., Joplin Div.
PR—G. H. Davis, .. Kansas City, Mo.
TR—F. A. Griffin, ... Rich Hill, "
GM—F. W. Griffen, " "
SECY—F. A. Griffin, " "
PA—F. W. Griffin, " "
MS—John S. Davis. "
SCO—Eureka Coal Mng. & Merc. Co.'s Store. Buyer, F. W. Griffin, Rich Hill, Mo.
S of H—Mules.
S of M—Hand.
PP—2 water tube boilers, total 200 H. P., 2 engines, 2 pumps.
EMP—65. Last fiscal year output 41,301 tons.

EXCHANGE MINING ASSOCIATION No. 305
Shaft Mine; Lexington Seam; 16 to 18 in. thick.
PO—Wellington, Mo SP—Same CTY—Lafayette; RR—Mo. Pacific.
PR—John McCrindle, . .Wellington, Mo.
GM—A. J .Blair, " "
GS—A. J. Blair, " "
PA—A. J. Blair, " "
MS—B. H. Cooper, " "
MM—Lucian Lineback, " "
EE—R. G. Burge, " "
S of H—Mules.
S of M—4 elec. machs.
PP—2 return tubular boilers, 250 H. P., 250 volts D. C.
EMP—75. Last fiscal year output, 20072 tons.

FARMERS FUEL CO.
General Office, Rialto Bldg., Kansas City, Mo.
PR—F. W. Lukins. .Kansas City, Mo.
GM—F. W. Lukins, " " "
VP—N. H. Lukins, " " "
TR—W. C. Duval, " " "
GS—N. R. Andrews, Higginsville, Mo.

Longwall Mine; Shaft and Drift; Seam, 15 to 18 in. thick.
PO—Higginsville, Mo.; SP—Same; CTY-Lafayette; RR—C. & A., Mo. Pac.
S of H—2 Elec. loco.
S of M—18 Elec. mach.
PP—1 Water tube, 5 return tubular boilers, total 800 H. P., 8 pumps.
EMP—200. Last fiscal year output 51,614 tons.

Nos. 1 and 6 Mines; Shaft; Seam, 15 to 20 in. hick.
PO—Higginsville, Mo.; SP—Same; CTY—Lafayette; RR—C. & A., Higginsville Switch Br.
S of H—2 Elec. loco.
S of M—8 Elec. mach.
PP—1 Water tube, 2 return tubular boilers, total 450 H. P., 3 pumps.
Last fiscal year output 14,855 tons.

No. 3 Mine; Seam 15 to 20 in. thick.
PO—Higginsville, Mo.; SP—Same; CTY—Lafayette; RR—C. & A., Mo. Pac., Higginsville Br.
Idle at present.

No. 7 Mine; Drift, Seam, 15 to 20 in. thick.
PO—Higginsville, Mo.; SP—Same; CTY—Lafayette; RR—C. & A., Mo. Pac. Higginsville Br.
S of M—10 Elec. mach.
PP—Power from No. 1 Mine, 1 return tubular boiler, 1 pump.
Last fiscal year output 36,758 tons.
Successors to the Farmers Coal Co.

FRANKENFIELD COAL MINING CO.
GM—A. Frankenfeld, . .Rich Hill, Mo.
PA—A. Frankenfield, " "
EM—J.W. Frankenfield, Rich Hill, Mo.
Sales agency, Burnett, Arnold Coal Co., Pittsburg, Kan.

Mine No. 3, Slope, Seam, 3 to 4 ft. thick.
PO—Rich Hill, Mo. SP—Foster, Mo. CTY—Bates. RR—Mo. Pac., Madison Branch.
MS—A. Frankenfield, . . Rich Hill, Mo
S of H—Mules and rope. Track gauge 35 in.
S of M—Hand.
Last fiscal year output 5,000 tons.

Black Duck No. 10 Mine, Stripping, Seam, 3 to 4 ft. thick.
PO—Rich Hill, Mo. SP—Foster, Mo. CTY—Bates. RR—Mo. Pac., Madison Branch.
MS—S. R. Frankenfield, Rich Hill, Mo.
S of M—Hand.
Last fiscal year output 4,000 tons.
(Old information.)

FOWLER COAL & MINING CO.
Shaft Mine.
PO—Richmond, Mo. CTY—Ray. RR—A. T. & S. F.
S of H—Rope and mules.
S of M—Hand.
EMP—100. State report.

FOX, W. H.
Out of business.

FULTON FIRE BRICK COMPANY.
Larimore Mine, Shaft, Bevier Seam, 2½ to 3½ ft thick.
PO—Fulton, Mo. SP—Same. CTY—Callaway. RR—C. & A.
PR—J. H. Atkinson. . . . . . . .Fulton, Mo.
TR—D. Threlkeld, " "
GM—L. U. Nickell, " "
PA—T. B. Jones, " "
MS—H. E. Harris, " "
S of H—Mules. Track gauge 26 in.
S of M—Hand.
PP—1 Atlas return tubular boiler, total 125 H. P., 1 gen. unit, 1 pump.
EMP—50. Last fiscal year output 18,000 tons.

GARRISON COAL CO.
Stripping Mine, Seam 36 to 60 ins. thick.
PO—Rich Hill, Mo. SP—Same. CTY—Bates. RR—Mo. Pacific.
GM—John L. Garrison. Rich Hill, Mo.
EMP—6. Output (winter season only) 800 tons.

GRAND RIVER COAL & COKE CO.
See Cainsville Coal Co.

GREER, J. J. & SON.
Greer Mine; Drift; Top Seam; 20 in. thick.
PO—Lexington, Mo.; SP—Same; CTY—Lafayette, RR—Mo. Pacific.
GM—J. J. Greer. . . . . . . .Lexington, Mo
PA—J. J. Greer, " "
MS—J. J. Greer, " "
SCO—Gillen Store. Buyer, E. J. Greer. Lexington, Ky.
S of H—Mules; track gauge 17 in.
S of M—Hand.
PP—1 boiler, 12 H. P., 1 pump.
EMP—25. Last fiscal year output 4,800 tons.

HAYNES COAL & MINING COMPANY.
No. 1 Colico, Stripping, Cherokee Seam, 32 in. thick.
PO—Ardath, Mo. SP—Same. CTY—Barton. RR—Frisco and Kans. City Sou.
GM—Wm. W. Haynes, . Arcadia, Kan.
MS—Jno. Haynes, ... Ardath, Mo.
EM—Jno. Haynes, " "
PA—Thos. Haynes, " "
SM—Thos. Haynes, " "
MM—Henry Arnold, " "
EE—Henry Arnold, " "
S of H—Rope, mules and steam locos. Track gauge 36 in.
PP—4 return tubular boilers. Sales agent, Wm. W. Haynes, Arcadia, Kan.
(Old information.)

HECKMORE MINING CO
Shaft Mine.
PO—Rich Hill, Mo. SP—Same. CTY—Bates. RR—Mo. Pacific.
S of H—Rope and mules.
S of M—Hand.
EMP—40.
Note—Mines worked out. Sinking new shafts.

HOLLAND COAL CO.
Mine abandoned.

HOME COAL CO.
Home Mine, Shaft, Mulkey Seam 18 to 26 in. thick.
PO—Macon, Mo. SP—Same. CTY—Macon, RR—C. B. & Q.
PR—M. T. Rombauer. . . . . .Macon, Mo.
TR—H. J. Whetsel, " "
PA—H. J. Whetsel, " "
GM—H. J. Whetsel, " "
EE—H. J. Whetsel, " "
MS—L. F. Bennight, " "
S of H—Mules. Track gauge 18 in.
S of M—2 elec. machines.
PP—1 water tube boiler, total 60 H. P., 1 pump Also power purchased.
EMP—120. Last fiscal year output 27,203 tons.
Sales agent, M. T. Rombauer, Macon, Mo.

HURST COAL CO.
Casper Creek, Shaft, Seam 32 in. thick.
PO—Deepwater, Mo. SP—Same. CTY—Henry. RR—K. C. C. & S.
PR—J. W. Hurst. . . . . .Deepwater, Mo
TR—J. W. Hurst, " "
PA—J. W. Hurst, " "
MS—George Hunt, " "
MM—George Hunt, " "
EE—George Hunt, " "
GS—Tom Hunt, " "
S of H—Mules. Track gauge 30 in.
S of M—Hand.
PP—2 water tube boilers, total 72 H. P., 1 gen. unit.
EMP—20. Last fiscal year output 5,815 tons.

IDEAL COAL & MINING CO.
Ideal Mine; Stripping Seam, 30 to 54 in. thick.
PO—Hume, Mo.; SP—Same; CTY—Bates; RR—Frisco.
PR—J. R. Burnett. . . . . .Hume, Mo.
TR—A. L. Billings, " "
GM—A. L. Billings, " "
GS—A. L. Billings, " "
PA—A. L. Billings, " "
MS—Wm. O'Toole, " "
EM—Fred Dauben, " "
S of H—Mules anl rope.
S of M—Hand.
PP—3 gasoline and 2 steam engines, 2 boilers, total 160 H. P., 3 pumps.
EMP—55. Output 150 to 200 tons per day.
Sales Agency, Barnett & Son.

INDEPENDENCE COAL & MINING CO.
See Napoleon Coal Co.

JOHNSON & JACKSON
Shaft, 52 to 58 ins. thick.
PO—Clifton Hill, Mo. CTY—Randolph.
PR—G. L. Johnson. . . .Clifton Hill, Mo.
PA—G. H. Jackson, " "
GM—J. M. Long, " "
MS—J. M. Long, " "
S of M—Hand.
EMP—6. Last fiscal year output 2,000 tons.

JONES COAL CO.
Slope Mine; Rich Hill Seam, 36 to 54 in. thick.
PO—Rich Hill, Mo.; SP—Same. CTY—Bates, RR—Mo. Pac.
PR—J. Elmer Jones, . . Rich Hill, Mo.
GM—J. Elmer Jones, " "
PA—J. Elmer Jones, " "
TR—W. W. Jamison, " "
MS—S. R. Campbell, " "
MM—T. W. Ellis, " "
S of H—Mules Track gauge 3[illegible].
S of M—Hand.
PP—2 Boilers, 2 pumps.
EMP—15. Last fiscal year output 9,400 tons.

KANSAS CITY MIDLAND COAL & MNG. CO.
General Office, Novinger, Mo.
PR—Edw. J. Corrigan, Kansas City, Mo
TR—Emmet Corrigan. . . . . .Novinger, Mo.
GM—Emmet Corrigan, " "
PA—Emmet Corrigan, " "
GS—J. J. Ward, " "
MS—J. J. Ward, " "
CE—J. J. Ward, " "
MM—J. J. Ward, " "
EE—J. R. Scott, " "

No. 4 Mine; Shaft; Bevier Seam, 36 to 44 in. thick.
PO—Novinger, Mo.; SP—Same; CTY—Adair; RR—C. B. & Q.
MS—B. T. Ward. . . . . . . .Novinger, Mo.
S of H—Mules. Track gauge 30 in.
S of M—Hand.
PP—2 return tubular boilers, 1 steam hoisting engine, 700 H. P., 1 pump.
EMP—250. Last fiscal year output 90,278 tons.

No. 5 Mine; Shaft; Bevier Seam; 36 to 44 in. thick.
PO—Novinger, Mo.; SP—Same; CTY—Adair; RR—C. B. & K. C.
MS—John Barren. . . . . . . .Novinger, Mo.
S of H—Mules and 1 elec. loco. Track gauge 30 in.
S of M—8 elec. mach.
PP—2 Murray Iron Works water tube, and 2 return flue boilers, total 325 H. P., 1 gen. unit, 250 volts D. C., 1 steam hoisting eng., 263 H. P., 1 pump.
EMP—235. Last fiscal year output 82,990 tons.

LANING-HARRIS COAL & GRAIN CO.
General Office, Kansas City, Mo.
Daisy Mine, Drift, Seam 18 in. thick.
PO—Wellington, Mo. SP—Same. CTY—Lafayette. RR—Mo. Pacific, Lexington Branch.
PR—C. B. Laning, . . Kansas City, Mo.
TR—H. Harris, " "
GM—H. Harris, " "
PA—H. Harris, " "
S of H—4 elec. locos. Track gauge 18 in.
S of M—8 elec. machines.
PP—2 Atlas return tubular boilers, total 300 H. P., 1 gen. unit, 250 volts, D. C., 3 pumps.
EMP—125. Last fiscal year output 30,000 tons. Sales agent, H. Harris.

LIBERAL COAL & MINING CO.
No. 1 Mine; Stripping; Seam 28 to 33 in. thick.
PO—Liberal, Mo.; SP—Same; CTY—Barton; RR—Frisco.
PR—J. H. Vincent. . . . . .Pittsburg, Kas.
CM—J. H. Vincent, " "
PA—J. H. Vincent, " "
GS—J. H. Vincent, " "
TR—H. R. Gilbert, ...Liberal, Mo.
SM—H. R. Gilbert, " "
S of H—1 steam loco. Track gauge 36 in.
S of M—1 steam shovel.
PP—2 boilers, total 250 H. P., 1 air compressor, 2 pumps.
EMP—30. Output 9,000 tons.

LINN COUNTY COAL MINING & LAND CO.
General Office, Kansas, City, Mo.
Shaft Mine; Marceline Seam, 24 to 30 in. thick.
PO—Brookfield, Mo.; SP—Same; CTY—Linn; RR—Burlington.
PR—Albert Tamm, . .Kansas City, Mo.
TR—Wm. H. Ashley, " " "
GM—J. J. Rafferty, . .Brookfield, Mo.
MS—J. J. Rafferty, " "
S of H—Mules; track gauge 26 in.
S of M—1 Elec. mach.
PP—1 Pump; power purchased.
EMP—20. Last fiscal year output 3000 tons.

McADOO & HARE COAL COMPANY.
Brownfield Mine Shaft; Lower Rich Hill Seam; 36 to 54 in. thick.
PO — Appleton City, Mo.; SP —Same; CTY—St. Clair; RR—M. K. & T.
PR—J. A. McAdoo, Appleton, City, Mo.
GM—J. A. McAdoo, Appleton City, Mo.
MS—T. W. Hare, Appleton City, Mo
S of H—Mules.
PP—1 pump.
EMP—5. Last fiscal year output, 1200 tons.

McCOMB COAL CO.
Rich Hill, Mo. No report.

McGREW COAL CO.
PR—E. J. McGrew, . . . Lexington, Mo.
TR—J. C. McGrew. . . . . .Lexington, Mo.
SM—J. C. McGrew, " "
GM—E. J. McGrew, " "
PA—E. J. McGrew, " "
GS—Thos. Wedge, " "
EM—Thos. Wedge, " "
CE—J. W. Bills, " "
MM—J. W. Bills, " "

McGrew No. 1 Mine, Drift, Bituminous Seam 22 in. thick.
PO—Lexington, Mo. SP—Myrick, Mo. CTY—Lafayette. RR—Mo. Pacific.
MS—Jack Bell. . . . . .Lexington, Mo.
S of H—5 Elec. loco.; track gauge 29 in.
S of M—6 elec. machines.
PP—3 Jno. O'Brien return tubular boilers, 2 gen. units, 250 volts D. C., 1 pump.
EMP—195. Last fiscal year output 54,600 tons.

McGrew's "Graddy" Mine, Drift, Bituminous Seam.
PO—Lexington, Mo. SP—Myrick, Mo. CTY—Lafayette. RR—Mo. Pacific.
MS—L. W. Goffin. . . . . .Lexington, Mo.
S of H—Mules. Track gauge 29 in.
S of M—8 elec. machines.
PP—2 pumps. Power from No. 1 mine.
EMP—203. Last fiscal year output 63,700 tons.

MACEY COAL MINES.
Joseph Perry & Son, Lessees.
Macey Mine, Drift, Seam 22 in. thick.
PO—Lexington, Mo. SP—Myrick Sta. CTY—Lafayette. RR—Missouri Pac.
GM—William Perry. . . . .Lexington, Mo.
MS—Jos. Perry, ... Lexington, Mo.
S of H—Mules.
S of M—Hand.

MARCELINE COAL & MINING CO.
General Office, 1510-1514 Commerce Bldg., Kansas City, Mo.
. .No. 2 Mine; Shaft; Seam 27 to 42 in. thick.
PO—Marceline, Mo. SP—Same. CTY—Linn. RR—A. T. & S. F.
PR—G. T. Walker. . . . .Kansas City, Mo.
TR—G. T. Walker, " "
VP—C. P. A. Clough, " "
SECY—J. A. Parkinson, " "
SUPT—J. Hemmings. . . . .Marceline, Mo.
PA—J. Hemmings, " "
Asst. Supt—Geo. Colville, " "
SCO—Marceline Mercantile & Supply Co. Buyer, J. Hemmings, Marceline, Mo.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—2 pumps. Purchase power.
EMP—300. Last fiscal year output 90,718 tons. Sales agent, J. Hemmings.

MARTIN, HUBBELL, OSBORNE COAL CO.
Now Belt Line Coal & Mining Co.

MARTINSBURG COAL & MINING CO.
Martinsburg Mine, Shaft, Seam 24 to 36 in. thick.
PO—Martinsburg, Mo. CTY—Audrain. RR—Wabash.
PR—A. Matthews, . . Martinsburg, Mo.
TR—R. W. Moser, " "
GM—Wm. P. Moser, " "
EM—Wm. P. Moser, " "
PA—Chas. E. Moser, " "
MS—J. F. Moser, " "
S of H—Mules.
S of M—Hand.
PP—Gen. unit.
EMP—20. Last fiscal year output 6322 tons. Sales agent, Wm. P. Moser.

MENDOTA COAL COMPANY.
Mine No. 2, Shaft, Seam 30 to 36 in. thick.
PO—Mendota, Mo. SP—Same. CTY—Putnam. RR—C. B. & Q., C. B. & K. C.
PR—H. B. Scott. . . . . . . .Burlington, Ia.
TR—E. Ketcham. . . . . . . .Mendota, Mo.
GM—W. D. Ketcham " "
PA—W. D. Ketcham . . . " "
MS—F. M. Beamhall, " "
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—2 return tubular boilers, 1 pump.
EMP—75. Sales agent, W. D. Ketcham, Mendota, Mo.

MERCANTILE COAL & MINING CO.
Mine No. 17, Shaft, Seam 30 in. thick.
PO—Richmond, Mo. SP—Same. CTY—Ray. RR—A. T. & S. F.
PR—J. W. Atwill, Box 624, Kan. City, Mo.
TR—J. W. Atwill, Box 624, Kan. City, Mo.
GM—F. R. Atwill, . . . Richmond, "
PA—F. R. Atwill, " "
MS—Robt. Blair, " "
EM—Robt. Blair, " "
EE—Murray Clivinger . . . . " "
S of H—Mules. Track gauge 30 in.

S of M—Hand and 2 elec. mach.
PP—2 water tubes, total 100 H. P., 1 gen. unit, D. C., 1 pump. Also buy power.
EMP—140. Last fiscal year output 350 tons per day.

MINDEN COAL CO.

General Office, Joplin, Mo.
Stripping Mines, 28 to 42 in. thick.
PO—Mindenmines, Mo.; CTY—Barton; RR—Mo. Pac.; Pgh. & Nevada Branch.
PR—J. G. Starr........Joplin, Mo.
TR—Wm. Houk, " "
VP—H. J. Sternberg....Pine Bluff, Ark.
Secy—W. H. Meierstein, Kansas City, Mo.
GM—O. S. Hubert, Mindenmines, Mo.
GS—Chas. Bugbee, " "
PA—O. S. Hubert, " "
S of H—1 Steam loco.; track gauge 42 in.
S of M—Hand.
PP—Locomotive type boiler, 240 H.P. 2 pumps.
EMP—25 to 40.

MISSOURI CITY COAL CO.

General Office, Missouri, City, Mo.
Missouri Mine, Shaft, Lexington Seam, 22 in. thick.
PO—Missouri City, Mo. SP—Same. CTY—Clay. RR—Wabash.
PR—Geo. C. Gray, ...Kansas City, Mo.
TR—Chas. G. Shaw, Missouri City, Mo.
GM—Chas. G. Shaw, " " "
PA—Chas. G. Shaw .. " " "
MS—Chas. G. Shaw .. " " "
CE—A. Battagler, " " "
SCO—Shaw & Donovan; Buyer L. E. Donovan, Missouri City, Mo.
S of H—Mules and steam loco. Track gauge 30 in.
S of M—Hand.
PP—2 boilers, 1 pump.
EMP—50. Last fiscal year output 17,498 tons. Sales agent, Missouri City Coal Co.

MITCHELL, W. E., COAL & MNG. CO.

Drift, Seam 4 ft. thick.
PO—Huntsville, Mo. SP—Same. CTY Randolph. RR—Wabash.
PR—W. E. Mitchell, ..Huntsville, Mo.
GM—W. E. Mitchell....Huntsville, Mo.
MS—W. E. Mitchell, " "
TR—Alfred Lovell......Huntsville, Mo.
PA—Alfred Lovell, " "
S of H—Mules. Track gauge 31 in.
S of M—Hand.
EMP—6. Last fiscal year output 3,150 tons.

NAPOLEON COAL COMPANY.

General office, Napoleon, Mo.
Napoleon Mine; Shaft; Soft Coal Block Seam;
PO—Napoleon, Mo. SP—Same; CTY—Lafayette; RR—Mo. Pac.
PR—G. W. Snell,......Napoleon, Mo.
MS—G. W. Snell, " "
CE—G. W. Snell, " "
TR—W. W. Snell, " "
GM—W.W. Snell, " "
GS—W. W. Snell, " "
PA—W. W. Snell, " "
S of H—Mules.
S of M—Hand.
PP—1 Kewanee Water tube boiler, total 80 H. P., 1 pump.
Note—Successors to Independence Coal & Mining Company.

NORTHERN CENTRAL COAL CO.

General Office, Higbee, Mo.
PR—I. H. Seaman, 28 Nassau St. New York, N. Y.
GM—H. N. Taylor, Keith & Perry Bldg., Kan. City, Mo.
GS—Wm. Harkes........Moberly, Mo.
CE—Wm. Harkes, " "
EM—D. E. Ingersoll, Huntsville, Mo.
PA—D. E. Ingersoll, " "
Sales Agent, R. C. Lanke, Moberly, Mo.

No. 2 Mine, Shaft, Seam 38 to 48 in. thick. Operate washery.
PO—Huntsville, Mo. SP—Same. CTY—Randolph. RR—Wabash.
MS—J. E. Jones.......Huntsville, Mo.
S of H—3 elec. loco. and mules. Track gauge 28 in.
S of M—Hand.
PP—6 return tubular boilers, total 550 H. P., 2 gen. units, 250 volts D. C., 4 pumps.
Note—Mine abandoned Oct. 2nd, 1914, but power plant in operation furnishing power for other mines.

No. 12 Mine, Shaft, Seam 38 to 48 in. thick. Operate washery.
PO—Huntsville, Mo. SP—Same. CTY—Randolph. RR—Wabash.
MS—John Powell, ... Huntsville, Mo.
S of H—Mules and 3 elec. loco. Track gaugue 36 in.
S of M—Hand.
PP—7 pumps. Power from No. 2 Mine.
EMP—300. Last fiscal year output 172,734 tons.

No. 11 Mine, Shaft, Seam 40 to 54 in. thick. Operate washery.
PO—Higbee, Mo. SP—Same. CTY—Randoph. RR—C. & A., M. K. & T.
MS—Montgomery Sharp....Higbee, Mo.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—5 return tubular boilers, total 400 H. P., 1 pump.
EMP—260. Last fiscal year output 125,682 tons.

No. 5 Mine, Shaft, Seam 4 to 5 ft. thick.
PO—Elliott, Mo. SP—Same. CTY—Randolph. RR—M. K. & T.
MS—Chas. Moore..........Elliott, Mo.
S of H—1 elec. loco. Track gauge 36 in.
S of M—Hand.
PP—2 return tubular boilers, total 300 H. P., 1 gen. unit, 250 volts D. C., 1 pump.
EMP—200. Last fiscal year output 70,000 tons.
Note—Idle at present.

NORTHWESTERN COAL & MINING CO.

General Office, Bevier, Mo.
PR—J. H. Bovard, .. Kansas City, Mo.
TR—C. G. Thurston, ... Bevier, Mo.
PA—C. G. Thurston, " "
GS—L. Larsen .... " "
EM—L. Larsen.............Bevier, Mo.
MM—L. Kroscup, ... Bevier, "
SCO—Albert Daniels,.....Bevier, Mo.

Mine No. 9, Shaft, "Bevier" Seam, 4 ft. 6 in. thick.
PO—Bevier, Mo. SP—Same. CTY—Macon. RR—Burlington.
S of H—Mules. Track gauge 2½ ft.
S of M—Hand.
PP—3 Boilers, total 300 H. P., 1 pump.
EMP—400. Capacity 900 tons per day.

NOVINGER COAL CO.

Shaft mine; Bituminous seam; 40 to 42 in. thick.
PO—Novinger, Mo.; SP—Same; CTY—Adair; RR—Q. O. & K. C. and I. & St. L.
PR—J. O .Harris.......Novinger, Mo.
TR—Pete Bardinsone.....Novinger, Mo.
MM—A. M. Canfield, " "
S of H—Mules. Track gauge 30 ins.
S of M—Hand.
PP—2 boilers, total 50 H. P., 2 steam Engines, 1 pump.
EMP—37. Last fiscal year output 1,020 tons.

PARKS COAL CO.

Slope Mine; Seam 40 in. thick.
PO—Calhoun, Mo.; SP—Same; CTY—Henry; RR—M. K. & T.
PR—A. F. Parks, ...Calhoun, Mo.
GM—A. F. Parks, " "
MS—John Cahl, " "
S of H—1 Steam loco. and mules; track gauge 36 in.
S of M—Hand.
PP—1 Pump.
EMP—40. Last fiscal year output 12,000 tons.

PERRY-McMAHAN COAL CO.

General Office, Kansas City, Mo.
Stripping Mine, Rich Hill Seam, 48 to 72 in. thick.
PO—Rich Hill, Mo.; SP—Panama, Mo.; CTY—Bates; RR—Mo. Pac.
PR—W. C. Perry, Kansas City, Mo.
TR—W. C. Perry, " " "
GS—E. O. McMahan....Rich Hill, Mo.
MS—C. H. Page........Panama, Mo.
S of H—1 Steam loco.; track gauge 42 in.
S of M—Hand.
PP—3 Return tubular boilers, total 250 H. P. and 2 pumps.
EMP—50. Out put 300 tons per day

PICKERING COAL COMPANY

Mines Nos. 4, 6, 9, 11, Shafts, "Lexington" and "Richmond" Seams, 24 in. thick.
PO—Richmond, Mo. SP—Same and Camden, Mo. CTY—Ray. RR—Santa Fe and Wabash.
PR—I. Pickering, ... Richmond, Mo.
TR—I. Pickering, " "
GM—I. Pickering, " "
GS—H. Pickering, " "
PA—Geo. Pickering, " "
MM—Harvey Pickering, " "
SCO—Pickering & Co. Buyer, Geo. Pickering.
S of H—Mules, 1 elec. and 1 storage battery loco. Track gauge 30 in.
S of M—Hand.
PP—1 water tube, 3 return tubular boilers, total 300 H. P., 6 pumps. Also purchase power.
EMP—350. Last fiscal year output 68,594 tons. Sales agent, I. Pickering.

PLATTENBURG COAL CO.

Plattenburg Mine; Drift; Bituminous Seam 18 to 24 in. thick.
PO—Lexington, Mo.; SP—Same; CTY—Lafayette; RR—Lexington & Sedalia.
PR—J. L. Plattenburg, Lexington, Mo.
TR—H. C. Wallace, " "
GM—Mat Atwood, " "
MS—Mat Atwood, " "
GS—Geo. M. Vaughan, Lexington, Mo.
S of H—Mules.
S of M—Hand.
EMP—30. Last fiscal year output 5,910 tons.

PSCHIRRER, CHAS., & SONS.

See Sprague & Co.

RALLS COUNTY COAL CO.

General Office, Hannibal, Mo.
Shaft Mine; Seam, 26 in. thick.
PO—Perry, Mo.; SP—Same; CTY—Ralls; RR—St. L. & Hannibal, Perry Br.
PR—J. T. Seaton......Hannibal, Mo.
TR—J. T. Seaton, " "
GM—J. T. Seaton, " "
PA—J. T. Seaton, " "
MS—Tom Waterson........Perry, Mo.
S of H—Mules.
S of M—Hand.
PP—Gasoline engine.
EMP—25. Last fiscal year output, 14,000 tons.

RAY COUNTY COAL CO.

General office, 1024 Scarritt Bldg., Kansas, City, Mo.
Ray County Coal Co. Mine; Shaft; 26 in. thick.
PO—Richmond, Mo.; SP—Same; CTY—Ray; RR—A. T. & S. F.
PR—M. A. Werries...Kansas City, Mo.
TR—F. H. Werries, " "
GM—F. H. Werries, " "
PA—F. H. Werries, " "
GS—John W. Bryce.....Richmond, Mo.
MS—John W. Bryce, " "
MM—Samuel Blacker, " "
EE—Samuel Blacker, " "
S of H—Mules. Track gauge 29½ in.
S of M—Hand.
PP—2 pumps. Purchase power.
EMP—100. Last fiscal year output 75,000 tons.

RELIANCE COAL CO.

Stripping Mine; Seam 30 to 42 in. thick.
PO—Brownington, Mo.; SP—Same; CTY—Henry; RR—Frisco.
PR—J. D. Livingston, Kingsbury Place, St. Louis, Mo.
GM—J. D. Livingston, Kingsbury Place, St. Louis, Mo.
PA—W. J. Livingston.....Clinton, Mo.
TR—F. C. Livingston.....Windsor, Mo.
MM—W. D. Beetiller...Deepwater, Mo.
MS—A. J. Tally, " "
S of H—Steam Hoist..
PP—4 Pumps.
EMP—50.
Last fiscal year output 32,000 tons.

RICE PERRY

See Thompson & Schooler Coal Co.

RITCHIE COAL MNG. COMPANY.

Ritchie Mine; Slope and Stripping; Seam 48 to 75 in. thick.
PO—Rich Hill, Mo. SP—Same. CTY—Bates, RR—Mo. Pacific, Fort Scott & Wichita branch.
PR—H. C. Ritchie, .. Rich Hill, Mo.
GM—H. C. Ritchie, " "
PA—Wm. Ritchie, " "
MS—Wm. Ritchie, " "
S of H—Mules and rope. Track gauge 36 in.
S of M—Hand.
PP—3 boilers, 45 H. P., 2 pumps.
EMP—13. Last fiscal year output 5,880 tons. Sales agent, Jones Coal Co.

RIVERSIDE COAL & MINING CO.

Shaft Mine; Bituminous Seam; 21 to 24 in. thick.
PO—Camden, Mo.; SP—Same; CTY—Ray; RR—Santa Fe & Wabash.
PR—E. L. Jordon.......Camden, Mo.
TR—Robert Walker, " "
MS—W. D. Hockensmith, " "
S of H—Mules.
S of M—Hand.
PP—1 return tubular boiler, total 75 H. P., 1 pump.

ROGERS COAL MINING CO.

No. 1 Mine; Shaft; 48 to 54 in. thick.
PO—Moberly, Mo.; SP—Same; CTY—Randolph; RR—W. A. B.
PR—W. B. Rogers, Moberly, Mo.
GM—W B. Rogers, Moberly, Mo.
MS—W. B. Rogers, Moberly, Mo.
EM—W B. Rogers, Moberly, Mo.
PA—J. W. Rogers, Moberly, Mo.
CE—A G. Rogers, Moberly, Mo.
SM—W B. Rogers, Moberly, Mo.
S of H—Mules.
S of H—Hand.
PP—2 boilers, total 300 H. P., 1 pump.

ROTHVILLE COAL CO.

Happy Hollow Mine, Drift, Seam 16 to 20 in. thick.
PO—Rothville, Mo. SP—Same. CTY—Chariton. RR—A. T. & S. F.
PR—A. T. Semple ......Rothville, Mo.
GM—O. B. Cameron...... " "
S of H—Hand. Track gauge 20 in.
S of M—Hand.
EMP—3. Last fiscal year output 800 tons.

SHERWOOD-LESTER COAL COMPANY

General Office, Liberal, Mo.
Stripping Mine; Cherokee Seam; 26 to 30 in. thick.
PO—Liberal, Mo.; SP—Same; CTY—Barton; RR—Mo. Pacific.
PR—L. H. Sherwood......Danville, Ill.
TR—Follett W. Bull......Chicago, Ill.
GM—W. J. Lester........Liberal, Mo.
GS—C. M. Hardy, " "
S of H—1 steam loco. Track gauge 42 in.
S of M—Hand and Bucyrus Shovel—100 H. P.

SMITH, H. J.

Wear Mine, Stripping, Seam 4½ ft. thick.
PO—Rich Hill, Mo. SP—Same. CTY—Bates. RR—Mo. Pac.
GM—H. J. Smith......Rich Hill, Mo.
GS—H. J. Smith, " "
SCO—Gench Bros., Rich Hill, Mo.
S of H—Mules.
S of M—Hand.
PP—1 pump. Last fiscal year output 1,400 tons.

SPRAGUE & CO.

No. 3 Mine; Shaft; Seam; 33 to 36 in. thick.
PO—Rich Hill, Mo.; SP—Sprague; CTY—Bates; RR—Frisco.
PR—Chas. Pschirrer......Sprague, Mo.
PA—Chas. Pschirrer, " "
TR—Anna Pschirrer, " "
GM—John Pschirrer, " "
MS—George Pschirrer, " "
S of H—Mules.
S of M—Hand.
PP—Boiler, 20 H. P., 3 steam engines, 2 pumps.
EMP—7. Last fiscal year output 3,000 tons.

STANDARD FUEL CO.

Shaft Mine; Seam, 30 in. thick.
PO—Vandalia, Mo.; SP—Same; CTY—Audrain; RR—C. & A.
PR—J. E. Henegar.......Vandalia, Mo.
TR—J. E. Henegar, " "
GM—J. E. Henegar, " "
PA—J. E. Henegar, " "
MS—J. E. Henegar, " "
S of H—Mules.
S of M—Hand.
PP—1 Pump.

STAR COAL CO.

Star Mine No. 1, Shaft, Tebo Seam 20 to 26 in. thick.
PO—Kirksville, Mo. SP—Same. CTY—Adair.
PR—Chas. Miller ......Kirksville, Mo.
TR—A. H. Garges ..... " "
GM—G. P. Underhill " "
PA—G. P. Underhill. " "
MS—Ed. White, " "
S of H—Mules. Track gauge 30 in.
S of M—2 elec. and 1 comp. air mach.
PP—Compressor and 1 pump. Power purchased.
EMP—55. Last fiscal year output 10,776 tons.

STOUT, W. A. & R. A.

Stout's Mine; Shaft; 6 to 24 in. thick.
PO—Lockwood, Mo.; SP—Same; CTY—Dade; RR—Frisco.
PR—W. A. Stout.......Lockwood, Mo.
GS—W. A. Stout, " "
PA—W. A. Stout, " "
GM—R. A. Stout, " "
MS—R. A. Stout, " "
S of H—Mules.
S of M—Hand.
PP—1 pump.
EMP—8. Last fiscal year output 1,644 tons.

SUNSHINE COAL CO.

Shaft Mine; Bituminous Seam; 36 to 44 in. thick.
PO—Rich Hill, Mo.; SP—Same; CTY—Bates; RR—Mo. Pac., Fort Scott Br.
PR—George J. Reik....Rich Hill, Mo.
GM—George J. Reik, " "
TR—B. A. Reik, " "
MS—Emil Hubart, " "
S of H—Mules.
S of M—Hand.
PP—1 pump.
EMP—5. Last fiscal year output 5,091 tons.

SWEDISH COAL CO.

Mindenmines, Mo. No report.

THOMPSON & SCHOOLER COAL CO.

Shaft Mine; Domestic Coal Seam 26 to 30 in. thick.
PO—Richmond, Mo; SP—Same; CTY—Ray; RR—A. T. & S. F.
S of H—Mules. Track gauge 30 in.
S of M—Hand.
EMP—25 to 35. Daily output, 30 to 50 tons.
Note—Successors to Perry Rice.

WALNUT CREEK COAL CO.
General Office, Shukert Bldg., Kansas City, Mo.
Black Diamond No. 2 Mine; Slope; Mulberry Seam, 34 to 40 in. thick.
PO—R. F. D., Hume, Mo.; SP—Foster, Mo.; CTY—Bates; RR—Mo. Pac., Madison Br.
PR—H. M. Herrold, Jr., Kansas City, Mo.
TR—A. F. Benosky, " " "
S of H—Mules.
S of M—Hand.
PP—2 Pumps.
EMP—6 to 30. Last fiscal year output, 5,950 tons.
Development work going on for past 2 years.

WALTON COAL CO.
Walton Mine; Shaft; Seam 36 to 48 in. thick.
PO—Higbee, Mo.; SP—Same, CTY—Randolph; RR—C. & A. and M. K. & T.
PR—Wm. Walton.......Higbee, Mo.
GM—Wm. Walton .... " "
PA—Wm. Walton .... " "
TR—John Cosgrove ......Boonville, Mo.

WATERLOO MINING ASSOCIATION.
Shaft Mine 18 to 20 in. thick.
PO—Wellington, Mo.; SP—Napoleon; CTY—Lafayette; RR—Mo. Pacific.
PR—Andrew Park, Wellington, Mo.
TR—R. L. Klemmer, Wellington, Mo.
GM—R. L. Klemmer, Wellington, Mo
EM—J L. Warren, Wellington, Mo.
S of H—Mules. Track gauge 16 in.
S of M—2 elec. machs.
PP—2 Fire tube boilers, total 225 H. P., 3 gen. units, 250 volts D. C, 3 pumps.
EMP—26. Last fiscal year output, 6,000 tons.

WAVERLY COAL CO.
General Office, Kansas City, Mo.
Buckham Mine; Shaft; Waverly Seam, 36 to 60 in. thick.
PO—Waverly, Mo.; SP—Same; CTY—Lafayette; RR—Mo. Pac. River Div.
PR—Col. F. B. Drage. Kansas City, Mo.
TR—F. W. Lukins....Kansas City, Mo.
GM—F. W. Lukins, " " "
PA—F. W. Lukins, " " "
GS—J. B. Argyle.........Waverly, Mo.
EM—J. B. Argyle, " "
MF—J. J. Boyd, " "
EE—Harry Lee, " "
S of H—4 Elec. loco.; track gauge 36 in.
S of M—7 Elec. mach.
PP—3 Erie City, return tubular boilers, total 425 H.P., gen. unit, 250 volts D.C., 1 pump.
EMP—65. Last fiscal year output 60,333 tons.

WESTERN COAL & MNG. CO.
General Office, St. Louis, Mo. 5 mines in Missouri, 3 mines in Arkansas, 1 mine in Illinois, 8 mines in Kansas.

Currant, Midway, Summit, South, East and West Mines, Shafts, Seam 22 in. thick.
PO—Lexington, Mo. SP—Myrick, Mo. CTY—Lafayette; RR—Mo. Pac.
PR—W. J. Jenkins......St. Louis, Mo.
TR—F. M. Hickman....St. Louis, Mo.
GM—W. J. Jenkins..... " "
GS—J. H. Shaw....... " "
PA—D. Simpson .... " "
EM—C. L. Moorman ..St. Louis, Mo.
MS—B. T. Wiley......Lexington, Mo.
S of H—Mules and elec.
S of M—Elec. mach.

WINE BROS.
Black Plum; Shaft; Seam 28 to 32 in. thick.
PO—Brookfield, Mo. CTY—Linn. RR—H. & St. Jo.
PR—H. C. Wine.......Brookfield, Mo.
GM—I. B. Wine...... " "
GS—I. B. Wine, " "
PA—I. B. Wine, " "
S of H—Mules and 1 gasoline loco. Track gauge 24 in.
S of M—Hand.
PP—1 pump.
EMP—15. Last fiscal year output 1,500 tons.

MONTANA

For List of Abbreviations See Page 622.

ALBA COAL COMPANY.
Alba Mine, Slope, Fort Union Seam, 60 to 72 in. thick.
PO—Fromberg, Mont., SP—Same; CTY—Carbon, RR—Northern Pacific.
PR—J. C. McCarthy....Fromberg, Mont.
GM—J. C. McCarthy, " "
PA—J. C. McCarthy, " "
TR—F. G. Weber, " "
MS—J. P. Johnston, " "
S of M—4 Sullivan elec. machs.
Sales agent, J. C. McCarthy, Fromberg, Mont.

ANACONDA COPPER MNG. CO.
(Coal Dept.)
General Office, Butte, Mont.
PR—B. B. Thayer, 42 Broadway, New York City
GM—F. W. C. Whyte..Anaconda, Mont.
PA—D. A. Welch.........Butte, Mont.
EM—R. R. Vail....Diamondville, Wyo.
Sales agents, Henry G. Pickerts and Geo. Blinn, Butte, Mont.

Washoe No. 2 Mine, Slope, "Bear Creek No. "283", Seam 78 in. thick.
PO—Washoe, Mont. SP—Same. CTY—Carbon.
RR—Montana, Wyoming and Southern.
MS—Thos. Good ....Washoe, Mont.
S of H—Horses, and 1 gasoline locomotive. Track gauge 3 ft.
S of M—Hand.
PP—3 return tubular boilers, 1 pump.
EMP—200. Last fiscal year output 121,249 tons.

Lochray Mine, Drift, Sand Coulee Seam, 6 to 8 ft. thick.
PO—Sand Coulee, Mont. SP—Tracy, CTY—Gascade. RR—G. N., Sand Coulee Branch.
MS—Chas. A. Sederholm, Sand Coulee, Mont.
S of H—Mules and 1 electric locomotive. Track gauge 3 ft.
S of M—Hand and 5 elec. mach.
PP—2 pumps, purchase power.
EMP—170— Last fiscal year output 104,000 tons.

ANDERSON & EVANS.
Controls 2440 acres of coal lands.
Hoffman Mine, Slope. No. 1, 2, 3 Seams, 3 to 7 ft. thick.
PO—Hoffman, Mont. SP—Same. CTY—Park. RR—N. P. Ry., Y P. Ry
GM—J. W. Anderson....Hoffman, Mont.
MS—T. J. Evans..... " "
EM—Chas Sachett...Livingston, Mont.
SCO—Hoffman Merc. Co., Buyer, Guy E. Teter, Hoffman, Mont.
S of H—Mules. Track gauge 30 in.
S of M—Hand.
PP—2 fireboxes, total 60 H. P., 1 pump.

BEAR CREEK COAL CO.
South Nos. 2 and 3 Mines; Slopes No. 3 Seam; 72 to 78 in. thick.
PO—Bear Creek, Mont. SP—Same. CTY—Carbon. RR—Montana, Wyo & Sou. Ry.
PR—A. H. Barth......Billings, Mont.
TR—J. H. Clark.....Bear Creek, Mont.
GM—J. H. Clark....Bear Creek, Mont.
Cashier—C. P. Hamrick, " " "
PA—J. H. Clark.... " " "
MS—M. J. McCabe, " "
MM—J. W. McDonald " " "
EE—J. W. McDonald " " "
EM—R. S. Robbins..Red Lodge, Mont.
S of H—4 electric locomotives. Track gauge 40 in.
S of M—7 chain breast elec. machines.
PP—4 Atlas water tube boilers, total 600 H. P., 250 volts D. C.
EMP—162. Last fiscal year output 90,000 tons.
Sales agents, Sturm & Yaw, Billings, Mont., H. M. Yaw, Great Falls, Mont.; H. H. Griffith, Butte, Mont. and C. H. Weeks Coal Co., Spokane, Wash.

BRIDGER COAL MINING CO.
Bridger No. 2 Mine; Slope; Seam 72 to 108 in. thick.
PO—Bridger, Mont. SP—Same CTY—Carbon; RR—N. Pac.
PR—W. E. Pinkney....Bridger, Mont.
GM—W. E. Pinkney, " "
PA—W. E. Pinkney, " "
TR—J. S. Emmett, " "
GS—W. E. Pinkney, " "
MM—Geo. W. Arrington " "
EE—Geo. W. Arrington, " "
CE—M. G. Swan......Fromberg, Mont.
EM—M. G. Swan, " "
SCO—Bridger Coal Mng. Co. Buyer, W. E. Pinkney, Bridger, Mont.
S of H—Rope and 1 Elec. loco.
S of M—Hand and 1 electric machine.
PP—5 Return tubular boilers, total 500 H. P., 2 gen. units, 500 volts D. C., 2 pumps.
EMP—60. Last fiscal year output 42,000 tons.

BRODIE, JAMES & SON.
No. 1 Mine; Drift; Seam 48 to 78 in. thick.
PO—Belt, Mont.; CTY—Cascade; RR—Great Northern.
TR—J. W. Brodie, ...Belt, Mont. thick.
GM—James Brodie........Belt, Mont.
EM—M. Laninger, " "
S of H—Mules. Track gauge 36 in.
S of M—2 Elec. mach. and hand.
PP—Boiler, 15 H. P., 2200 volts A. C., power purchased.
EMP—100. Output 7,500 tons.

BROWN COAL CO.
PO—Sand Coulee, Mont. No report.

CALONE & JOHNSON.
Calone and Johnson Mine; Drift; Seam, 66 in. thick.
PO—Belt, Mont.; CTY—Cascade; RR—Great Northern.
GM—Chas. G. Johnson......Belt, Mont.
GS—Frank Calone, " "
S of H—Mules.
S of M—1 Elec. mach.
PP—Power purchased.
EMP—6. Last fiscal year output, 6,500 tons.

CARBON COAL CO.
Carbon Mine; Drift; Sand Coulee Seam; 72 to 96 in. thick.
PO—Sand Coulee, Mont. SP—Same. CTY—Cascade. RR—G. N., Sand Coulee Branch.
PR—George Wilson..Sand Coulee, Mont.
GM—George Wilson.. " "
MS—George Wilson.. " "
TR—F. S. McClure, " "
PA—A. Morton .. " "
EM—R. R. Vail, " "
MM—Ben Boyer, " "
EE—Ben Boyer, " "
S of H—Tail rope. Track gauge 3 ft.
S of M—4 compressed air machines.
PP—4 return tubular boilers, total 160 H. P., 4 pumps.
EMP—40. Last fiscal year output, 35,000 tons. Sales agent, Sturm & Yaw, Great Falls, Mont.

COTTONWOOD COAL CO.
General Office, St. Paul, Minn
Nos 5, 6 and 7 mules, Drift.
PO—Stockett, Mont. SP—Same. CTY Cascade. RR—G. N.
GM—James Pearson....Stockett, Mont.
PA—F. A. Bushnell....St. Paul, Minn.
EM—R. A. Burns......Stockett, Mont.
MS—W. Numan ...... " "
SM—A. J. Kruger...... " "
S of H—Rope, mules and elec. loco.
S of M—Elec. and comp. air machine.
PP—5 boilers, total 100 H. P., gen. units A. C.
(Old information.)

FROMBERG COAL CO.
Fromberg, Mont. No report.

INTERNATIONAL COAL CO.
International Mine, Slope and Drift, Nos. 3 and 4 Seams; 54 to 66 in. thick.
PO—Bear Creek, Mont. SP—Same. CTY—Carbon. RR—M. W. & S.
PR—W. A. Talmage.......Joliet, Mont.
TR—B. G. Shorey.......Billings, Mont.
GM—H. H. Pinkney, Bear Creek, Mont.
MS—Peter Pryde....
S of H—Mules and 1 elec. loco. Track gauge 36 in.
S of M—5 Elec. mach. and hand.
PP—4 water tube boilers, 1 gen. unit. 220 volts D. C., 1 pump.
EMP—100. Last fiscal year output 59,468 tons. Sales agent, International Coal Co., Billings, Mont.

MACKTON COAL CO. (THE)
Mackton Mine; Slope; Fort Union Seam, 7½ to 9 ft. thick, operate washery.
PO—Big Sandy, Mont. SP—Same. CTY—Chouteau. RR—Great Northern.
PR—Paul H. Schwartz. Big Sandy, Mont.
GM—Paul H. Schwartz. " "
TR—Hans H. Lehfeldt. " "
PA—Hans H. Lehfeldt. " "
MS—L. S. Proctor ... " "
CE—L. S. Proctor .... " "
S of H—Rope. Track gauge 36 in.
S of M—Hand and 3 Elec. mach.
PP—4 return tubular boilers, total 400 H. P., 3 gen. units, 500 volts D. C., 2 pumps.

MERKLE, GEO. W., COAL CO.
Drift Mine, 54 to 84 in. thick.
PO—Belt, Mont.; SP—Same; CTY—Cascade; RR—Great Northern.
PR—G. W. Merkle, ...Belt, Mont.
GM—G. W. Merkle, " "
TR—G. W. Merkle, " "
GS—G. W. Merkle, " "
MS—A. Brutofski, " "
S of H—Rope; track gauge, 42 in.
S of M—Hand.
PP—2 Return tubular boilers.
EMP—45. Last fiscal year output 20,000 tons.

MILK RIVER COAL CO.
Milk River Mine, Slope, Lignite Seam 6 ft. thick.
PO—Chinook, Mont. SP—Same. CTY—Blaine. RR—Great Northern.
PR—Jurgen Kuhr ......Chinook, Mont.
GM—Jurgen Kuhr ...... " "
TR—Thos O'Hanlon .... " "
MS—Clarence Sargent .. " "
S of H—Mules.
S of M—Hand.
PP—1 pump.
EMP—6 to 18. Last fiscal year output 6,500 tons.

MILLARD COAL COMPANY
General Office, Belt, Mont.
Millard Mine; Drift; Millard Seam; 66 to 72 in. thick.
PO—Belt, Mont.; SP—Same; CTY—Cascade, RR—G. N. R. R.
PR—H. W. Millard.......Belt, Mont.
GM—H. W. Millard " "
PA—H. W. Millard " "
MS—H. W. Millard "
S of H—Mules.
S of M—1 comp. air mach.
PP—2 water tube boilers, total 40 H. P., 1 compressor.
EMP—7. Last fiscal year output 3,560 tons.

MONTANA COAL & IRON CO.
Drift and Slope Mines, Nos. 2 and 3 Seams, 5 ft. 8 in. thick.
PO—Washoe, Mont. SP—Bear Creek, Mont. CTY—Carbon. RR—M. W. & S.
TR—C. W. Stone.....New York, N. Y.
GM—J. M. Freeman ....Washoe, Mont.
PA—J. M. Freeman .... " "
GS—J. M. Freeman " "
S of H—Mules and 2 electric locos- Track gauge 36 in.
S of M—8 elec. mach.
PP—250 volts D. C.
175,000 tons.

NATIONAL COAL MINING CO.
National Mine; Slope; 72 to 120 in. thick.
PO—Sand Coulee, Montana; SP—Same; CTY—Cascade; RR—Great Northern.
PR—Jas. R. Brown, Sand Coulee, Mont.
TR—Jas. R. Brown, " "
GS—Jas. R. Brown, " "
PA—Jas. R. Brown, " "
MS—Henry Rrott, " "
CE—R. R. Vale, " "
EM—R. R. Vale, " "
S of H—Mules and rope
S of M—2 comp. air mach.
PP—2 return tubular boilers, total 120 H. P., 1 air comp., 1 pump.
EMP—18. Last fiscal year output 16,807 tons.

NELSON COAL CO.
General Office, Great Falls, Mont.
Economy Mine; Drift; Seam 96 in. thick;
PO—Sand Coulee, Mont. SP—Same. CTY—Cascade. RR—G. N., Sand Coulee Branch.
PR—John W. McClure, Great Falls, Mont.
TR—John W. McClure. " "
GM—Jas. P. Danson, " "
PA—Jas. P. Danson, " "
MM—H. F. Thoma. Sand Coulee, Mont.
EE—H. F. Thoma... " "
S of H—Mules, rope and 1 electric locomotive. Track gauge 36 in.
S of M—Hand and 14 compressed air machines.
PP—Generating units, A. C., 3 phase, 60 cycles, 1 air compressor, 2 pumps, purchase power.
EMP—150. Last fiscal year output 62,848 tons.

NORTHWESTERN IMPROVEMENT CO.
General Office, Tacoma, Wash.
Red Lodge Mine, Slope, "Semi Bituminous" Seam, 5 to 12 ft. thick, operate washery.
PO—Red Lodge, Mont. SP—Same. CTY—Carbon. RR — Northern Pacific.
PR—William P. Clough..New York City.
VP—Thomas Cooper....St. Paul, Minn.
TR—C. A. Clark...... " "
GM—C. C. Andersen....Tacoma, Wash.
Comptroller—M. P. Martin, " "
PA—F. G. Prest.......St. Paul, Minn.
MS—Wm. Haggerty....Red Lodge, Mont.
EM—F. A. Roberts, " "
MM—Thos. J. Murphy.. " "
EE—Thos. J. Murphy.. " "
S of H—Rope and 18 Elec. loco.; track gauge 36 in.
S of M—Hand.
PP—7 B. and W. water tube boilers, 4 Erie return tubular boilers, total 2,200 H. P., 5 generating units, 2,300 volts, A. C., single phase, 60 cycles and 250 volts D. C., 3 pumps.
EMP—810. Last fiscal year output 708,489 tons.
Sales Agent, Wm. Freakes, Red Lodge, Mont.

REPUBLIC COAL CO.
General Office, 1368 Fullerton Ave., Chicago, Ill.
Klein No. 2, Shaft, Roundup Seam, 6 ft. thick.
PO—Klein, Mont. SP—Same. CTY—Musselshell. RR—C. M. & St. P
PR—E. D. Sewall........Chicago, Ill.
TR—F. G. Ranney....... " "
PA—J. T. Crocker....... " "
GM—Jas. Needham........Chicago, Ill.
GS—Jas. Needham .... " "
EM—C. F. Brenn........Granville, Ill.
MM—Albert Gately......Klein, Mont.
MS—Wm. Redshaw, " "
SCO—Bull Mountain Trading Co.
S of H—Mules and 2 Elec. and 2 gasoline loco.; track gauge 42 in.
S of M—Hand and 10 elec. machines.
PP—4 pumps, return tubular boilers, total 1350 H. P., 2 gen. units D. C.
EMP—451. Last calendar year output 506,482 tons.

ROUNDUP COAL MINING COMPANY
General Office, Omaha, Neb.
PR—G. W. Megeath......Omaha, Neb.
TR—A. P. Whitmore, " "
GM—H. S. Hopka.....Roundup, Mont.
GS—H. S. Hopka, " "
PA—H. S. Hopka, " "
EM—L. J. Cake, " "
MM—L. E. Brown, " "
SCO—Address the Company. Buyer H. S. Hopka, Roundup, Mont.

No. 3 Mine; Slope; Bull Mt. Seam, 48 to 72 in. thick.
PO—Roundup, Mont.; SP—Same; CTY—Musselshell; RR—C. M. & St. P.
MS—Jos. Brown.......Roundup, Mont.
S of H—Mules and 3 elec. locos. Track gauge 42 in.
S of M—2 elec. mach.
PP—5 water tube boilers, total 950 H. P., 3 pumps.
EMP—300. Last fiscal year output 300,000 tons.

No. 5 Mine; Slope; Bull Mt. Seam; 48 to 60 in. thick.
PO—Carpenter Creek, Mont.; SP—Geneva; CTY—Musselshell; RR—C. M. & St. P.
MS—John Mates.Carpenter Creek, Mont.
S of H—1 elec. loco. Track gauge 42 in.
S of M—2 elec. mach.
PP—4 water tube boilers, total 500 H. P., 3 pumps.
EMP—100.
Note—No. 5 Mine, new operation.

SMOKELESS & SOOTLESS COAL CO.
S. & S. Mines, Drift and Slope, No. 2 and No. 3 Seam, 7 to 10 ft. thick.
PO—Washoe, Mont. SP—Bear Creek.

CTY—Carbon. RR—M. W. & S., N. P. Branch.
PR—J. F. Brophy, ... Washoe, Mont.
GM—J. .F Brophy, " "
PA—J. F. Brophy, " "
TR—K. C. Brophy, " "
EE—Carl Johnson, " "
S of H—3 elec. and 2 steam hoists with ropes. Track gauge 36 in.
S of M—6 elec. machines.
PP—3 return tubular boilers, total 330 H. P., 2 gen. units, 250 volts, D. C., 3 pumps.
EMP—50 to 75. Last fiscal year output 50,000 tons. Sales agent, V. F. Toomey, Washoe, Mont.

STAINSBY & LATHAM COAL CO.
Stainsby Mine, Drift.
PO—Sand Coulee, Mont. SP—Same. CTY—Cascade. RR—Great Northern.
GM—Wm. Stainsby..Sand Coulee, Mont.
PA—Jas. Latham .. " "
S of H—Mules.
S of M—Hand.
EMP—20.

STAR COAL COMPANY.
General office, Musselshell, Montana.
Slope Mine; Carpenter Creek Seam; 66 in. thick.
PO—Musselshell, Mont.; SP—Same; CTY Musselshell; RR—C. M. & St Paul.
PR—Frank O'Meara, Musselshell. Mont.
TR—Walter Scott, Musselshell Mont.
GM—Frank B. Shafer.
S of H—Mules. Track gauge 36 in.
S of M—Elec. mach.
PP—2 return tubular boiler, total 250 H. P.

WASHINGTON MONTANA COAL & DEVELOPMENT CO.
Maxey Mine, Slope and drift.
PO—Chimney Rock, Mont. SP—Cooks Mine Station, Mont. CTY—Park. RR—N. P.
PA—John Maxey...Chimney Rock, Mont.
MS—Wm. Maxey, " "
SM—David Maxey, " "
EM—C. T. Sackett...Livingston, Mont.
CE—C. T. Sackett, " "
S of H—Mules.
S of M—Comp. air machines.
PP—4 boilers, 320 H. P.
EMP—65.

Nevada

DARMS COAL MINING CO.
General Office, Tonopah, Nev.
Darms Mine; Slope; 21 to 84 in. thick.
PO—Coaldale via Millers, Nev.; SP—Same; CTY—Esmeralda; RR—T. & G. R. R.
PR—H. A. Darms......Coaldale, Nev.
TR—C. H. Connett " "
GM—H. A. Darms " "
GS—H. A. Darms " "
S of H—Steam loco. Track gauge 30 in.
S of M—Hand.
PP—1 boiler, ,total H. P. 60.
EMP—3 to 5.
Note—At present engaged in development work.

NEW MEXICO

For List of Abbreviations See Page 622.

ALBUQUERQUE & CERILLOS COAL CO.
General Office, Albuquerque, N. M.
PR—G. A. Kaseman, Albuquerque, N. M.
TR—G. A. Kaseman, " "
GM—G. A. Kaseman, " "
PA—G. A. Kaseman, " "
MS—H. C. Schick, ...Madrid, N. M.
GS—H. C. Schick, " "
MM—H. C. Schick, " "
EE—H. C. Schick, " "
SCO—Madrid Supply Co. Buyer, J. M. Terry, Madrid, N. Mex.
Sales Agency, G. A. Kaseman, Albuquerque, N. M.; Southwestern Coal Co., Amorillo, Tex.; Dallas, Tex.; and Wichita, Kas.; S. C. Awbrey & Co., El Paso, Tex.; C. P. Heaton & Co., Los Angeles, Cal.

No. 4 Anthracite Mine; Slope; Lucas Seam, 30 to 38 in. thick.
PO—Madrid, N. M.; SP—Waldo, N. M.; CTY Santa Fe; RR—A. T. & S. F.
S of H—Mules and rope. Track gauge 40 in.
S of M—Hand and 1 elec. mach.
PP—2 Babcock & Wilcox stirling water tube boilers, total 600 H. P., 2 gen. units, 2,300 volts A. C., 3 phase, 60 cycles; 1 pump. Purchase power.
EMP—100. Last fiscal year output 60,000 tons.

Jones Mine; Slope; Cook and White Seam, 36 to 48 in. thick.
PO Madrid, N. M.; SP Waldo, N. M., CTY—Santa Fe; RR—A. T. & S. F.
SM—J. M. Terry.....Madrid, N. Mex.
S of H—1 elec. loco. and mules. Track gauge 40 ins.
S fo M—Hand and 3 elec. mach.
PP—600 H. P., 2 gen. units, 2300 volts A. C., 3 phase, 60 cycles, 1 air comp.
EMP—100. Last fiscal year output 60,000 tons.

BAUDDINO CO.
Baudino Mine; CTY—McKinley.
GM—Frank Bauddino..Gibson, N. Mex.
State report.

CARTHAGE FUEL CO.
General Office, San Antonio, N. M.
Carthage Mines, Slope, Carthage Seam, 4½ to 6½ ft. thick.
PO—Carthage, N. M. SP—Same. CTY—Socorro. RR—New Mexico, Midland.
PR—Powell Stackhouse, Jr. San Antonio, N. M.
GM—Powell Stackhouse, Jr., San Antonio, N. M.
PA—Powell Stackhouse, Jr., San Antonio, N. M.
TR—E. C. Brechtel, " "
SCO—Carthage Merc. Co. Buyer, Wm. MacDougall, Carthage, N. M.
S of H—Rope and elec. Track gauge 36 in.
S of M—Hand.
PP—2 Casey-Hedges Marine type return tubular boilers, total 300 H. P., 2 gen. units, 2,200 volts A. C., 3 phase 60 cycles, 2 comp. and 5 pumps.
EMP—150. Last fiscal year output, 52,382 tons. Sales Agent, Powell Stackhouse, Jr., San Antonio, N. M.

COAL BASIN CO.
Beddow Mine; Shaft.
PO—Gallup, N. M. CTY—McKinley.
PR—T. E. Pollock......Flagstaff, Ariz.
TR—R. E. Hoppel, Albuerqueque, N. M.
GM—R. R. Pollock, Albuquerque, N.M.
MS—P. Westwater......Gallup, N. M.

DIAMOND COAL CO., THE
General Office, Albuquerque, N. M.
Diamond Mine, Shaft, Seam 3 to 6 ft. thick.
PO—Allison, N. M. SP—Galleys, N. M. CTY—McKinley, RR—A. T. & S. F.
PR—T. E. Pollock......Flagstaff, Ariz.
TR—R. E. Hoppel,...Albuquerque, N. M.
Secy—R. E. Hoppel, " "
GM—R. R. Pollock, " "
PA—R. R. Pollock, " "
SM—R. R. Pollock, " "
MS—Pete Westwater....Allison, N. M.
MM—F. J. Allison, " "
S of H—Mules, rope and 1 gasoline loco. Track gauge 4 ft.
S of M—7 Comp. air mach.
PP—4 Kewanee return tubular boilers, total 360 H. P., 1 air comp., 1 pump.
EMP—185. Last fiscal year output 178,937 tons. Sales agent, R. R. Pollock, Albuquerque, N. M.

DIRECT LINE COAL CO.
Jones Mine; Slope; Seam; 36 to 60 in. thick.
PO—Gallup, N. M.; SP—Delco; CTY—McKinley; RR—Santa Fe.
PR—H. R. Coughlin Gallup, N. M.
TR—R. A. Jones " "
GM—A. A. Jones, " "
GS—A. A. Jones " "
PA—A. A. Jones, " "
MS—James Brown " "
MM—W. H. Jones " "
EM—S. E. Wood " "
SM—C. H. Williams " "
S of H—Steam.
S of M—Hand.
PP—2 Return Tubular Boilers, total 300 H. P. 2 Gen. Units.
EMP—35. Last fiscal year output, 9,000 tons.

EMERSON & ALLAIRE.
General Office,.... San Antonio, N. M.
Emerson Mine, Slope, Carthage Seam, 6 to 7 ft. thick.
PO—Carthage, N. M. SP—San Antonio, N. M. CTY—Socorro. RR A. T. & S. F.
GM—P. A. Allaire, San Antonio, N. M.
MS—R. E. Law......Carthage, N.M.
PA—Allaire McIntyre Co.
SCO—Allaire McIntyre Co., Buyer, P. A. Allaire.
S of H—Rope. Track gauge 36 in.
S of M—Hand.
PP—2 return tubular boilers, total 120 H.P., 1 air comp., 1 pump.
EMP—30. Output for 3 months, 4,000 tons. Sales agent, Allaire McIntyre Co., San Antonia, N. Mex.

ENTERPRISE COAL CO.
Drift Mines; Lignite Seam; 44 to 64 in. thick.
PO—Gallup, N. M.; SP—Same; CTY—McKinley; RR—A. T. & S. F.
PR—Stewart Brown......Gallup, N. M.
TR—Hutchinson Brown, " "
GM—W. L. McVicker, " "
PA—W. L. McVicker, " "
MS -A. H. McVicker, " "
S of H—Mules (will install gasoline motors).
S of M—Hand (will install elec. mach).
Sales Agency, Santa Fe Fuel Co., El Paso, Texas.

GALLUP SOUTHWESTERN COAL CO. LTD.
Atherton Mine; Slope, "Black Diamond" Seam, 54 to 78 in. thick.
PO—Gallup, N. M. SP—Same. CTY — McKinley. RR—A. T. & S. F.
PR—Samuel Atherton, Shrewsbury, Eng.
TR—W. L. Morris,.......Gallup, N. M.
GM—Sharp Hanson, " "
MS—Sharp Hanson, " "
PA—Victor Fuel Co.......Gibson, N. M.
S of H—Mules and elec. hoists. Track gauge 36 in.
S of M—Hand.
PP—220 volts A. C. Purchase power.
EMP—63. Last fiscal year output 66,220 tons.

GOVERNMENT MINE.
Zuni Pe er Mine, Drift.
PO—Black Rock, N. M. CTY—McKinley.
GM—R. J. Bauman, Black Rock, N.M.
MS—Frank Armanini, " "
S of H—Gravity.
S of M—Hand.

HENDRICKSON, L. W.
Kirtland Mine; Slope; Bituminous Seam; 16 ft. thick.
PO—Kirtland. N. M.; SP—Farmington, N. M. CTY—San Juan. RR—D. R. G. R.
MS—W. I. Hendricks..Kirtland, N. M.
S of H—Horses. Track gauge narrow.
S of M—Hand.
Fire in mine at present. Expect to recommence operations shortly.

LEWISHON ESTATE, (THE)
A. Gibbons, Agent, San Pedro, N. Mex.
No report.

LUCHETTI COAL CO.
Luchetti Mine, Slope, Amorgo Seam, 36 to 48 in. thick.
PO—Monero, N. M. SP—Same. CTY—Rio Arriba; RR—D. & R. G. Ry.
GS—A. Luchetti........Monero, N. M.
S of H—Rope and 1 steam loco. Track gauge 30 in.
. 30 in.
S of M—Hand.
PP—Boilers, 80 H. P.
EMP—15. Last fiscal year output 8,325 tons.

ST. LOUIS, ROCKY MTN. & PACFIC CO.
General Office, Raton, New Mexico.
PR—J. Van Houten..Raton, New Mexico
GM—Allan French, " "
TR—Charles Springer " "
PA—Allan French ... " "
EM—Frank A. Young. " "
MM—John Evans, Jr. " "
EE—John Evans, Jr. " "
SCO—Blossburg Mercantile Co. Buyer, C. W. Wildenstein, Raton, N. M., Sales agent, J. C. Larkin, Raton, N. M.

Koehler Mine, Drift, Raton Seam, 4 to 12 ft. thick. Operate washery.
PO—Koehler, N. M. SP—Same; CTY—Colfax RR—St. L. R. M. & P., Koehler Branch.
MS—Joe Collier........Koehler, N. M.
SM—J. C. Moore, " "
S of H—Mules and 6 Elec. locomotives. Track gauge 40 in.
S of M—Hand and 2 Elec. mach.
EMP—350. Last fiscal year output, 583,603 tons.
Coke Ovens—210 Bee Hive.

Van Houten Mine, Drift, Raton Seam, 4 to 12 ft. thick.
PO—Van Houten, N. M. SP—Same. CTY—Colfax. RR—A. T. & S. F., Hebron Branch.
MS—James Stewart..Van Houten, N. M.
SM—Ernest Brunelli.. " "
S of H—Mules and 5 elec.. locomotives. Track gauge 40 in.
S of M—Hand and 10 Elec. mach.
EMP—300. Last fiscal year output 564,120 tons.

Brilliant Mine, Drift, "Brilliant" Seam, 4 to 7 ft. thick.
PO—Brilliant, N. Mex. SP—Same. CTY—Colfax. RR—A. T. & S. F., Dillon Branch.
MS—Peter Gardner ...Brilliant, N. M.
SM—M. R. Boyer, " "
S of H—Mules and 1 elec. locomotive. Track gauge 40 in.
S of M—Hand, 2 elec. mach.
EMP—150. Last fiscal year output 160,708 tons.

(Continued on Next Page.)

St. Louis, Rocky Mtn. & Pacific Co.—Cont.

Gardiner Mine, Drift, "Raton" Seam, 4 to 7 ft. thick, operate washery.

PO—Gardiner, N. Mex. SP—Same. CTY—Colfax. RR—A. T. & S. F., Dillon Branch.

MS—James Burkholder .Gardiner, N. M.
SM—J. Hodges, " "
S of H—Mules and 1 elec. locomotive.
S of M—Hand.

PP—3 return tubular boilers, total 350 H. P., 1 generating unit, 550 volts, also purchase power.

EMP—125. Coke Ovens—200 Bee Hive. Last fiscal year output, 172,613 tons.

Sugarite Mine, Drift, "Raton" Seam, 4 to 6 ft. thick.

PO—Sugarite, N. Mex. SP—Same. CTY—Colfax. RR—Santa Fe, Raton & Eastern, Sugarite Branch.

MS—Bert Lloyd ......Sugarite, N. M.
SM—John Evans ...... " "
S of H—Mules and 2 elec. locomotives.
S of M—Hand and 4 elec. machines.
PP—3 return tubular boilers, total 600 H. P., 2 generating units, 550 volts, 2 pumps.
EMP—150. Last fiscal year output 163,176 tons.

STAG CANON FUEL CO.

General Office, Dawson, N. M.

No. 1, 2, 3, 4 and 5 Mines; Slopes; "Blossburg" Seam, 5 to 11 ft. thick. Operate washery.

PO—Dawson, N. Mex. SP—Same. CTY—Colfax. RR—E. P. and S. W. Sys.

GM—T. H. O'Brien ..Dawson, N. M.
MS—Wm. Hutchings ... " "
PA—C. A. Austin..99 John St., N. Y.
PA—J. A. Hurst...Dawson, N. Mex.
SM—T. C. Hill.... " "
CE—C. Legrand ......Douglas. Ariz.
SCO—Phelps, Dodge Merc. Co., Dawson, N. Mex. Buyer, Phelps, Dodge Merc. Co., 99 John St., New York, N. Y.
S of H—Mules, rope, 4 steam locomotives and 25 elec. locomotives. Track gauge 36 in. and 42 in.
S of M—Hand and 28 electric machines.
PP—Sterling boilers, total 2,200 H. P., 5 generating units, 2,300 volts, A. C., 250 volts D. C., 3 phase, 25 cycles, 7 pumps, 1 air comp. Power distributed to substations and transformed to 260 V. D. C.
EMP—2,000 Last fiscal year output 1,300,000 tons. Coke ovens—570 Bee Hive and underflue. Sales agent, Dawson Fuel Sales Co., Dawson, N. Mex.

STEVENS MINE.

Lessee, W. B. Keener, Fruitland, N. Mex. Drift; 144 in. thick.
PO—Fruitland; CTY—San Juan.
S of H—Mules
S of M—Hand.
EMP—3. Last fiscal year output 1,000 tons.
Note—Idle during greater part of year.

THOMAS, W. H.

PO Pendleton, N. Mex. CTY—San Juan.
No report.

VICTOR-AMERICAN FUEL CO.

General Office, Denver, Colo., 4 mines in N. Mex., 8 mines in Colorado.
TR—G. F. Bartlett......Denver, Colo.
GM—W. J. Murray...... " "
PA—John McGowan...... " "
EM—Chief, F. W. Whiteside " "
MM—N. J. Chapin....Denver, Colo.
GS—W. F. Murray.....Gibson, N. Mex.
SCO—Western Stores Co., Buyer, W. H. Howell, Denver, Colo., Sales agent, W. H. Huff, Denver, Colo.

Weaver Mine, Slope, Seam, 60 to 66 in. thick.

PO—Gibson, N. Mex. SP—Gallup, N. Mex. CTY—McKinley. RR—A. T. & S. F.
MS—Ed. Thomas......Gibson, N. Mex.
SM—M. M. Shelton... " "
S of H—Mules and rope. Track gauge 40 in.
S of M—Hand.
PP—Power furnished from a central plant.

Heaton Mine, Slope, Seam 40 to 48 in. thick.

PO—Heaton, N. Mex. SP—Gallup, N. Mex. CTY—McKinley. RR—A. T. & S. F.
MS—Robt. Dennard....Heaton, N. Mex.
S of H—Mules and rope. Track gauge 40 in.
S of M—Hand.
PP—Power furnished from Central plant.

Navajo Mine, Slope, Seam 68 to 73 in. thick.

PO—Gibson, N. Mex. SP—Gallup, N. Mex. CTY—McKinley. RR—A. T. & S. F.
MS—Jas. Yates,......Gibson, N. Mex.
S of H—Mules and rope. Track gauge 40 in.
S of M—Hand.
PP—Power furnished from central plant.

WILD CAT CO.

Wild Cat Mine CTY—Lincoln.
GM—A. A. Lane....White Oaks, N. Mex.

NORTH DAKOTA

For List of Abbreviations See Page 622.

BITUMINA COAL MINE CO.

Bitumina Mine; drift; Lignite Seam; 132 in. thick.
PO—Washburn, N. D.; SP—Same; CTY—McLean; RR—M. St. P. & S. St. M.
GM—Edward Kugler, Washburn, N. D.
GS—Edward Kugler " "
PA—Edward Kugler " "
CE—Edward Kugler " "
EM—Edward Kugler " "
MM—Edward Kugler " "
MS—Peter Wihm " "
S of H—Horses.
S of M—2 Comp. air machs.
PP—1 Return tubular boiler, total 55 H. P., 2 gen. units, 1 pump and 1 air compressor.
EMP—12 Last fiscal year output, 7,000 tons.
NOTE—Formerly known as "John Satterlund."

BLACK DIAMOND COAL COMPANY.

Black Diamond Coal Co. Mine.
PO—Beulah, N. Dakota; SP—Same—CTY—Mercer; RR—N. P.
PP—Carl Semmle....Beulah, N. Dakota
GM—Carle Semmle " "
TR—Mina Semmle " "
S of H—Mules.
S of M—Hand.
NOTE—Just commencing development.

BRODIE MINING CO.

Brodie Mine; Drift; 120 in. thick.
PO—Medora, N. D.; SP—Same; CTY—Billings; RR—N. P.
GM—J. F. Brodie.......Medora, N. D.
MS—Tom Carr " "
S. of H.—Mules.

CLERMONT COAL COMPANY.

General Office, Haynes, N. Dakota.
Clermont Mine; Slope; Haynes Vein; 156 to 192 in. thick.
PO—Haynes, N. D.; SP—Same; CTY—Adams; RR—C M & St. P.
PR—A. W. Peterson,....Haynes, N. D.
GM—A. W. Peterson " "
GS—A. W. Peterson " "
PA—A. W. Peterson.....Haynes, N. D.
MS—A. W. Peterson " "
TR—F. M. Jackson,...Hettinger, N D.
EM—E. Cornella,......Haynes, N. D
MM—L. P. Walsh " "
S of H—Rope and steam.
S of M—Hand.
PP—1 Water tube boiler, total 40 H. P.
EMP—1 to 15. Last fiscal year output, 7,000 tons.

CONSOLIDATED COAL CO.

Lehigh Mine, Slope, Seam 9 to 16 ft. thick.
PO—Lehigh, N. D. SP Same. CTY—Stark. RR—Nor Pac.
PR—Amasa P. Peake.Valley City, N. D.
GM—J. F. Brodie.....Dickinson, N. D.
GS—J. F. Brodie, " "
PA—Jos. H. Schestak..Lehigh, N. D.
MS—Joseph H. Schestak, " "
S of H—Mules.
S of M—Hand and 3 elec. machines.
PP—2 return tubular boilers, total 300 H. P., 1 gen. unit 220 volts D. C., 1 pump.
EMP—25.

DAKOTA COAL PRODUCTS CO.

Slope, Upper Seam; 66 to 78 in. thick.
PO—New Salem, N. D. SP—Same. CTY—Morton. RR—N. P. Ry.
PR—W. W. Woodhall.Minneapolis, Minn.
TR—R. W. Webb... " "
GM—A. J. Gray....New Salem, N. D.
PA—A. J. Gray. " "
EM—A. J. Gray.... " "
MS—August Sundstron " "
CE—R. J. Gray, " "
EE—R. J. Gray, " "
S of H—Mules and Steam Hoists. Track gauge 36 in.
S of M—2 electric machines.
PP—Water tube boilers, 150 H. P., 1 generating unit, 260 volts D. C.
EMP—14. Last fiscal year output 17,800 tons. Sales agent, Norman Daffinsud. New Salem. N. D.

DAKOTA LIGNITE MINES CO.

General Office. Dickinson. N. D.
PR—W. L. Richards...Dickinson, N. D.
TR—Henry Truelsen .. " "
PA—Henry Truelsen .. " "
GM—Henry Fruelsen, " "

Zenith No. 2 Mine, Slope, Lignite Seam, 23 ft. thick.
PO—Zenith, N. D. SP—Same, CTY—Stark. RR—N. P.
MS—August Teubert ....Zenith, N. D.
SCO—S. J. Cody & Co. Buyer, J. S. Cody, Zenith, N. D.
S of H—Mules and rope.
S of M—Hand.
PP—2 boilers, total 70 H. P.
EMP—20-30.

Pittsburgh Mine. Slope, Lignite Seam. 12 ft. thick.
PO—Lehigh, N. D. SP—Same. CTY Stark; RR—N. P.
S of H—Mules and rope.
S of M—Hand.
PP—Boiler, 100 H. P.
EMP—20.
Output, both mines, 44,000 tons.

DAUGHERTY COAL CO.

Slope Mine; Seam 96 in. thick.
PO—Noonan, N. D.; SP—Same; CTY—Divide; RR—S. N. & Soo.
GM—Chas. Daugherty, ..Minot, N. D.
PA—Chas. Daugherty, " "
MS—W. E. Coleman, Noonan, N. D.
S of H—Steam loco.; track gauge 24 in.
S of M—Hand.
EMP—60. Last fiscal year output 37,000 tons.
Successors to C. Daugherty.

GREENUP, J. S.

Miller Mine; Stripping; Lignite Seam; 120 in. thick.
PO—Stampede, N. D.; SP—Same; CTY—Burke; RR—Soo & G W, Berthold Crosby Br
EMP—8.

HIGH GRADE LIGNITE COAL CO.

High Grade Mine; Slope; 108 to 120 in. thick.
PO—Medora, N. D.; SP—Same CTY—Billings; RR—N. P. Main Line.
PR—N. D. Nichols, ...Medora, N. D.
TR—W. J. Ray, " "
GM—N. D. Nichols, " "
GS—N. D. Nichols, " "
PA—W. J. Ray, " "
MS—N. D. Nichols, " "
CE—G. E. Burgess..Jamestown, N. D.
EM—G. E. Burgess, " "
S of H—Mules; track gauge 36 in.
EMP—24. Last fiscal year output 23,000 tons.

HOUGHT COAL COMPANY.

Hought Mine; Slope; 84 to 96 in. thick.
PO—Noonan, N. Dak.; SP Same; CTY—Divide; RR—Gr. N.
PR—James Hought......Noonan, N. D.
GM—James Hought, " "
GS—G. Wadley, " "
MS—Nels Simonson, " "
S of M—Hand.
EMP—25. Last fiscal year output, 15,000 tons.

HUSEBYE COAL CO.

Husebye Mine; Shaft; Lignite Seam; 120 in. thick.
PO—Williston, N. Dak.; SP—Same; CTY—Williams; RR—G. N.
PR—J. A. Husebye....Williston, N. D.
MS—F. A. Bryant, " "
S of H—Mules.
S of M—Hand.
PP—1 water tube boiler, total 35 H. P.
Output last fiscal year 12,000 tons.

KENMARE BRICK & COAL CO.

Out of business.

LLOYD COAL CO.

General Office, Minot, N. D.
Paradise No. 1 and Foxholm No. 2, Slopes.
PO—Burlington, N. D. SP—(1) Same, (2) Foxholm. CTY—Ward. RR—Soo Line.
GM—David Lloyd ......Minot, N. D.
MS—Mr. Stewart....Burlington, N. D
S of M—Hand.
S of H—Mules and gravity.

McCLURE COAL CO.

General Office, Minot, N. D.
Tasker Mine, Slope, Lignite Seam, 8ft. thick.
PO—Tasker, N. D. SP—Vanderwalker, N. D. CTY—Ward. RR—Minneapolis, St. Paul and Sault Ste Marie. Main Line.
PR—Geo. H. Atwood..Stillwater, Minn.
TR—Geo. E. McClure....Minot, N. D.
GM—Geo. E. McClure.... "
PA—Geo. E. McClure..Tasker. N. D.
S of H—Mules. Track gauge 29 in.
S of M—Hand.
PP—1 Atlas water tube boiler, total 125 H. P.
EMP—28. Last fiscal year output 24,404 tons.
Note—Idle during past year.

NATIONAL BRIQUETTING CO.

General Office, 417 Plymouth Bldg., Minneapolis, Minn.
National Mine; Slope; Seam 66 in. thick.
PO—Kenmare, N. D.; SP—Same; CTY—Ward; RR—Soo.
PR—H. E. Soule...Minneapolis, Minn.
TR—F. E. Abbott.....Kenmare, N. D.
MGR—F. E. Abbott, Kenmare, N. D.
PA—F. E. Abbott, " "
MM—F. E. Abbott, " "
MS—J. W. Dering, " "
S of H—Elec. loco. and mules; track gauge 30 in.
S of M—1 elec. mach.
PP—Purchase power. 1 pump.
EMP—35. Last fiscal year output, 23,042 tons.

LORBESKI COAL CO.

Noonan Mine; Drift; 84 in. thick.
PO—Noonan, N. D. SP—Same. CTY—Divide; RR—Great Northern, Birthold branch.
GM—J. Lorbeski ......Noonan, N. D.
PA—J. Lorbeski ...... " "
MS—J. Lorbeski ...... " "
SCO—Address the company. Buyer, J. Lorbeski, Noonan, N. D.
S of H—Gravity.
S of M—Hand.
EMP—20 to 30. Last fiscal year output, 45,000 tons.

NORTHERN BRIQUETTING CO.

Davis Mine, Slope.
PO—Burlington, N. D. SP—Same. CTY—Ward.
GM—L. M. Davis...Burlington, N. D.
PA—L. M. Davis... " "
EM—L. M. Davis... " "
MS—W. A. Wiethoff " "
SM—W. A. Wiethoff " "
MF—Wm. Cozen .... " "
S of H—Rope.
S of M—Hand.
PP—Boiler, 85 H. P.
EMP—48.
(Old information.)

SATTERLUND, JOHN

See Bitumina Coal Mine Co.

SCRANTON COAL CO.

Scranton Mine; Slope, Seam 228 in. thick.
PO—Scranton N. D.; SP—Same; CTY—Bowman; RR—C. M. & St. P.
PR—C. A. Liddell.....Scranton, N. D.
GM—W. A. Shaw, " "
PA—W. A. Shaw, " "
TR—R. J. List, " "
MS—W. A. Shaw, " "
S of H—Mules. Track gauge 29 in.
S of M—Hand.
PP—1 pump.
EMP—7. Output 12,000 tons.

STEVENS & GUNDERSON.

General Office Haynes, N. D.
Stevens Coal Mine; 168 in. thick.
PO—Haynes, N. D.; SP—Same. CTY—Adams. RR—C. M. & St. P.
S of H—Horses
S of M—Hand.
Last fiscal year output 2966 tons.

TRUAX COAL CO.

Truax Mine, Slope, Lignite Seam, 7 to 8 ft. thick.
PO—Noonan, N. D. SP—Same. CTY—Divide. RR—G. N.. Ry., Curly Buthold.
PR—E. M. Truax......Noonan, N. D.
GM—E. M. Truax...... " "
PA—E. M. Truax...... " "
SM—E. M. Truax...... " "
TR—Miss D. L. Truax, " "
EM—A. M. Leogelan, " "
MS—A. H. Truax...... " "
S of H—Gravity and 1 gasoline locomotive. Track gauge 28 in.
S of M—Hand.
PP—2 Boilers, total 170 H. P.
EMP—75. Last fiscal year output, 30,000 tons.

U. S. RECLAMATION SERVICE.
Reclamation Min., 72 to 108 ins. thick.
PO—Williston, N. D. SP—Same. CTY—Williams. RR—G. N.
GM—Wm. S. Arthurs....Willston, N. D.
PA—Wm. S. Arthur.. " "
GS—Wm. S. Arthur, " "
MS—A. B. Innis, " "
MM—S. L. Sinclair, " "
EE—S. L. Sinclair, " "
SCO U. S. R. S. Mercantile Store. Buyer, Wm. S. Arthur, Williston, N. D.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—8 Babcock and Wilcox Sterling water tube boilers, total 2080 H. P., 4 gen. units, 2340 volts A. C., 3 phase, 60 cycles.
EMP—40 to 65. Last fiscal year output, 45,000 tons.

WALLACE, J. S.
Wallace Mine, Drift Upper Larimy Seam, 9 to 10 ft. thick.
PO—Burlington, N. D. SP—Same. CTY—Ward. RR—Soo.
MS—John Miller ..Burlington, N. D.
S of H—Mules.
S of M—Hand.
EMP—25. Last fiscal year output 10,000 tons.

WASHBURN LIGNITE COAL CO.
General Office, Minneapolis, Minn.
Wilton Mine No. 1, Shaft, Seam 8 to 16 ft. thick.
PO—Wilton, N. D. SP—Same. CTY—McLean. RR—M. St. P. & St. M., N. P.
PR—B. W. Stephenson.Minneapolis, Minn
TR—W. H. Keller.... " "
GM—W. P. Macomber...Wilton, N. D.
GS—P. J. Cahill....... " "
PA—F. M. Pettygrove.... " "
SM—F. M. Pettygrove, Wilton, N. D
MS—Thos. Jones and D. M. Quigley, Wilton, N. D.
EM—David Wilson ....Wilton, N. D.
MM—I. G. Iverson...... " "
EE—I. G. Iverson and B. Bartholomen, Wilton, N. D.
S of H—Mules and elec. locos
S of M—9 elec. machines.
PP—8 pumps; 5 boilers; total 900 H. P.
Sales agent, W. P. Macomber, Wilton, N. D.

WILLISTON COAL & POWER CO.
Black Diamond Mine, Drift, Lignite Seam 11½ ft. thick.
PO—Williston, N. D. SP—Same. CTY—Williams. RR—Great Northern R. R.
PR—J. W. Jackson..Williston, N. D.
GM—J. W. Jackson.. " "
GS—Aleck Thompson . " "
MS—Fred Frye, " "
S of H—Mules.
S of M—Hand.
EMP—10. Last fiscal year output 5,000 tons.
Sales agent, N. B. Ludowese, Williston, N. D.

ZIMDARS, HENRY
Greenup Mine, Slope and Stripping, Lignite Seam 7 to 11 ft. thick.
PO—Columbus, N. D. SP—Same and Stampede. CTY—Burke. RR—Sou, Flaxton Ambrose Br. and G. N. Berthold Crosby Br.
GM—Henry Zimdars..Columbus, N. D.
MS—Gust. Kielhack .. " "
S of H—Mules. Track gauge 32 in.
S of M—Hand.
EMP—10. Last fiscal year output 9,000 tons.

OHIO

For List of Abbreviations See Page 622.

ADENA COAL COMPANY
Adena Mine; Stripping; Ohio No. 8 Seam; 60 in. thick.
PO—Adena, O.; SP—Same; CTY—Jefferson; RR—W. & L. E.
PR—S. M. Downer.......Adena, Ohio
PA—S. M. Downer, " "
TR—Geo. E. Lockhart, Washington, Pa.
S of H—2 steam locos.
PP—Purchase power.

AGRICULTURAL & COMMERCIAL LIME CO., THE
General Office, Canton, Ohio.
A. and C. Mine, Drift, No. 4 Seam, 3 to 5 ft. thick.
PO—North Industry, O. SP—Same. CTY—Stark. RR—B. & O.
PR—C. W. Keplinger......Canton, O.
TR—H. J. Taggart........ " "
GM—H. J. Taggart........ " "
GS—E. W. Cheney...North Industry, O.
MS—Rudy Frank .. " "
S of H—Mule. Track gauge 28 in.
S of M—Hand.
PP—2 return tubular Erie boilers, total 200 H. P.
EMP—35. New mine.

AKRON COAL CO. (THE)
General Office, Akron, O.
PR—Jas. P. Loomis........Akron, O.
GM—Jas. P. Loomis........ " "
TR—J. M. Rowley.......... " "
SECY—N. E. Thomas...... " "
PA—N. E. Thomas......... " "
GS—Wm. Rigby........Cambridge, O.
CE—Wm. Rigby........ " "

Murry Hill No. 2, Slope Mine, No. 7, Cambridge Seam from 5½ to 7 ft. thick.
PO—Kipling, O. SP—Cambridge, O. CTY—Guernsey. RR—B. &O.
MS—Wm. Rigby ......Cambridge, O.
S of H—2 Elec. loco. and mules, track gauge 42 in.
S of M—5 elec. machines.
PP—3 return tubular boilers, total 450 H. P., 1 gen. units, 150 volts D. C.
EMP—165. Last fiscal year output, 210,000 tons.

Silver Creek Mine, Drift Mine, No. 6 Goshen, 4½ ft. thick.
PO—Wainright, O.; SP—Tuscarawas, O.; CTY—Tuscarawas. RR—B. & O.
MS—W. D. Jones........Wainright, O.
S of H—Mules, track 38 in. gauge.
S of M—2 Elec. mach.
PP—1 Erie return tubular boilers, 150 H. P., 75 K. W., 1 pump.
EMP—85. Last fiscal year output, 75,000 tons.

Klondyke Mine; Slope; No. 7 Cambidge Seam, 60 to 72 in. thick.
PO—Kipling, O.; SP—Cambridge, O.; CTY—Guernsey; RR—B. & O.
MS—Wm. Rigby........Cambridge, O.
S of H—Rope; track gauge 42 in.
S of M—5 Elec. mach.
PP—3 Return tubular boilers. total 450 H. P., 2 gen. units, 250 volts D. C., 2 pumps.
EMP—160.
Last fiscal year output 200,000 tons.

Kings Mine; Shaft; No. 7 Seam; 66 to 84 in. thick.
PO—Kipling; SP—Cambridge; CTY—Guernsey; RR—B. & O.
MS—Wm. Rigby........Cambridge, O.
S of H—2 elec. loco. Track gauge 42 in.
S of M—4 elec. mach.
PP—4 Erie water tube boilers, total 600 H. P., 1 gen. unit, 250 volts D. C., 4 pumps.
New mine.

ALLBURN COAL CO.
Allburn Mine, Slope, Wellston, No. 2, Seam 22 to 42 in. thick.
PO—Wellston, O. SP—Same. CTY—Jackson. RR—C. H. V. & T.
PR—C. M. Reese..........Wellston, O.
PA—C. M. Reese, " "
GM—S. R. Poole ...... " "
MS—S. R. Poole .... " "
TR—H. Reese ....Glen Roy, O.
S of H—Mules. Track gauge 3 ft.
S of M—Hand.
PP—Purchase power.

AMERICAN CEMENT PLASTER CO.
General Office, Lawrence, Kans.
Banting No. 1 Mine; Slope; Gypsum Seam.
PO—Gypsum, O.; SP—Same; CTY—Ottawa; RR—N. Y. C.
PR—A. Henley........Lawrence, Kans.
TR—J. A. Henley, " "
GM—R. A. Henley, " "
GS—R. A. Henley, " "
PA—R. A. Henley, " "
CE—John Joyce......Port Clinton, O.
EM—E. J. Hughes, " " "
MS—E. J. Hughes, " " "
EE—L. V. Ayers, " " "
S of H—Mules.
S of M—5 Elec. mach.
PP—3 Water tube boilers, total 475 H. P., gen. units, 220 volts D. C., 1 pump.
EMP—75.
Last fiscal year output, 33,200 tons.
Successors to the Fishack Gypsum Co.

AMERICAN GYPSUM CO. (THE)
American No. 1 Mine, Shaft, Gypsum Rock, 6 to 8 ft. thick.
PO—Port Clinton, O. SP—Same. CTY—Ottawa. RR—L. S. and M. S.
PR—Jas. H. McCrady...Braddock, Pa.
TR—J. B. Davis ....Cleveland, O.
GM—F. J. Griswold...Port Clinton, O.
PA—F. J. Griswold... " "
GS—C. A. Loder .... " "
MS—A. C. Chase .... " "
EM—John J. Joyce... " "
MM—A. Frontz ..... " "
EE—A. C. Ruhl ..... " "
S of H—Electric, 1 elec. loco.
S of M—6 Elec machines, 4 air mach.
PP—3 water tube boilers, Heine Safety boiler, total 540 H. P., 1 gen. unit, 1 air compressor, 1 pump.
EMP—210. Sales agent, A. R. Black, Port Clinton, O.

AMERICAN SEWER PIPE CO.
General Office, Akron, O.
PR—Geo. R. Hill.............Akron, O.
TR—A. S. McCombe, " "
GM—Marshall Caine, " "
GS—Marhall Caine, " "
PA—B. J. Hill. " "
SM—B. J. Hill, " "
CE—R. H. Hussell, " "
EM—R. H. Russell, " "
EE—R. H. Russell, " "
MM—W. H. Rook, " "

American Sewer Pipe No. 31, Shaft, Clay Vein; 30 to 48 in. thick.
PO—Brazil, Ind.; SP—Same; CTY—Clay; RR—I. & E.
MS—Frank Carnahan......Brazil, Ind.
S of H—Mules. Track gauge 33 in.
PP—3 pumps. Receive power from factory.
EMP—20. Last fical year output 11,287 tons.

Forest City Mine; Slope; Clay Vein; 20 to 28 in. thick.
PO—Toronto, Ohio; SP—Same; CTY—Jefferson; RR—Penna., C. & P. Div.
MS—W. B. Francy.........Toronto, O.
S of H—Mules. Track gauge 33 in.
PP—2 pumps. Receive power from factory.
EMP—6. Last fiscal year output 7,351 tons.

Diamond Mine; Drift; Pittsburgh No. 6 Seam; 40 to 48 in. thick.
PO—Urichsville, O.; SP—Same; CTY—Tuscarawas; RR—B. & O., P. C. C. & St. L.
MS—Walter J. Moore.....Urichsville, O.
S of H—Mules. Track gauge 28 in.
PP—1 pump.
EMP—9. Last fiscal year output 5711 tons.
Note—Use output in sewer pipe and brick plants.

AMERICAN SHEET & TIN PLATE CO.
General Office, Pittsburgh, Pa.
Aetna Mine, Drift.
PO—Aetnaville, O. CTY—Tuscarawas.
MS—Wm. Fitzgerald, Martin's Ferry, O.
EMP—59.

ARMSTRONG COAL CO.
Armstrong and Lucy Mines, slope and Drift; No. 2 Seam.
PO—Jackson, O.; SP—Same; CTY—Jackson. RR—D. T. & I.
GM—Guy Smales ....Jackson, O.
MS—S. Walker .... "
PA—Guy Sell .... " "
EM—Bert Brown ....Coalton, O.
S of H—Mules and rope.
S of M—Hand.
PP—Boiler 50 H. P.
Coke Ovens, 125.

AUGUSTA COAL CO.
Out of business.

BAKEWELL COAL CO (THE)
Knob Mine, Drift, Pittsburg Seam No. 8, 5 to 6 ft. thick.
PO—Bellaire, O. SP—Carloads, Knob Mine Siding, Georgetown, Belmont Co., O. Less than carloads, Bellaire, O. CTY—Belmont. RR—B. & O. main line.
PR—J. L. Bakewell....Brownsville, Pa.
TR—T. W. Pearsall.......Bellaire, O.
PA—T. W. Pearsall....... " "
MS—J. C. Smith......... " "
S of H—3 elec. loco. Track gauge 40 in.
S of M—8 elec. machines.
PP—2 return tubular boilers, total 300 H. P., 250 volts D. C., 1 pump.
EMP—275.

BANFIELD CLAY COMPANY.
General Office, Irondale, O.
Slope Mine; No. 3 Vein; 39 to 42 in. thick.
PO—Irondale, O.. SP—Same. CTY—Jefferson. RR—Penn'a.
PR—H F. Banfield, Wellsville, O.
TR—W. P. Banfield, Irondale, O.
PA—W P. Banfield, " "
GS—J. C. Wilson, " "
MS—Wm. Nightingale, " "
S of H—Mules and 1 steam hoisting loco.
S of M Hand.
PP—1 pump.
EMP—10. Last fiscal year output 5,300 tons.

BANNOCK COAL COMPANY
Taplin Mine; Slope; Pittsburgh No. 8. Seam; 60 in. thick.
PO—Bellaire, O.; SP—Same; CTY—Belmont; RR—B. & O.; C. L. & W. Div.
PR—W. J. Morgan...... Bellaire, O.
TR—A. J. Morgan ...." "
GM—A. J. Morgan " "
GS—Jacob Long..........Bannock, O.
PA—Herbert McVay, ...Bellaire, O.
MS—Wilson Hoyt, ...Bannock, O.
EM—D. A. Elkin.........Bellaire, O.
S of H—Mules and 1 elec. loco. Track gauge 42 in.
S of M—3 elec. mach.
PP—Power purchased.
EMP—75.

BARBER, O. C. MNG. & FERTILIZER CO. (THE)
General Office, 706 Courtland Building, Canton, Ohio.
Mine No. 1 and 2, Drifts.
PO—North Industry, O.; SP— Same; CTY—Stark; RR—B. & O.
PR—Ohio C. Barber.........Akron, O.
TR—L. D. Brown......... " "
GM—H. V. Briggle........Canton, O.
PA—H. V. Briggle, " "
MS—E. W. Oldham, North Industry, O.
S of H—Mules and elec.
PP—Total boiler H. P. 675.
Sales Agent, S. L. Briggle, Canton, O.

BARNES COAL & MINING CO., (THE) ..
General Office, Coshocton, O.
PR—Rollin N. Barnes....Coshocton, O.
TR—Clyde F. Barnes, " "
PA—Clyde F. Barnes, " "
GM—Rollin N. Barnes, " "
GS—Rollin N. Barnes. " "
Sales Agents, Goff-Kirby Coal Co., Cleveland, O.

Best No. 1, Drift, Middle Kittanning Seam, 3½ to 5 ft. thick.
PO—Conesville, O., SP— Same, CTY—Coshocton; RR—W. & L. E.
MS—C. H. Crossley....Conesville, O.
S of H—Rope; track gauge 32 in.
S of M—3 Elec. mach.
PP—1 Erie water tube boiler, 150 H. P., 1 pump.

Best No. 2, Drift, Middle Kittanning Seam, 4 ft thick.
PO—Conesville, O., SP—Same, CTY—Coshocton; RR—W. & L. E.
S of H—1 Elec. loco., track gauge 42 in.
S of M—3 Elec. mach.
PP—1 water tube boiler, 150 H. P. 100 K. W., 120 volts D. C., 1 pump.

BARTON COAL CO., (THE)
General Office, Cleveland, O.
Taggert Mine, Drift, Pittsburgh No. 8 Seam, 5 ft. thick.
PO—St. Clairsville, Ohio, SP—Same, CTY—Belmont; PO—B. & O., St. Clairsville Br.
PR—H. W. Townsend..New London, O.
TR—A. W. Dean........Cleveland, O.
GM—P. Townsend, " "
PA—A. J. Wiegand, " "
S of H—Mules and 2 elec. loco. Track gauge 42 in.
S of M—8 Eec.. mach.
PP—250 Volts, D. C., 3 pumps.
EMP—120. Last fiscal year output 98,000 tons.

B. B. COAL CO.
B. B. Coal Co. Mine; Slope; 30 to 60 in. thick.
PO—Canal Fulton, O.; SP—Same; CTY—Stark.
PR—P. J. Blank, Canal Fulton, O.
TR—Wm. Blank, " " "
GM—Wm. Blank, " " "
PA—Wm. Blank, " " "
EM—Wm. Blank, " " "
GS—J. P. Blank, " " "
S of H—Mules.
S of M—Hand.
PP—1 return tubular boiler, 100 H. P., 2 pumps.
EMP—6. Last fiscal year output 3,306 tons.

BEECH FLATS COAL CO.
General Office, Danville, Ill.
Sunshine Mine; Stripping; Pitsburgh No. 8 Seam, 58 in. thick.
PO—Rush Run, O.; SP—Same; CTY—Jefferson; RR—Penna.
PR—W. G. Hartshorn....Danville, Ill.
GM—W. G. Hartshorn, " "
TR—R H. Sherwood. " "

(Continued on Next Page.)

Beech Flats Coal Co.—Cont.
MS—W. B. Reid........Rush Run, 0.
EE—Frank Burns, " "
S of H—2 Steam loco.; track gauge 42 in.
S of M—1 Comp. air mach.
PP—2 Boilers, 1 gen. unit, 3 phases, 60 cycles, 1 air comp., 1 pump.
EMP—60. Last fiscal year output 146,000 tons.
Sales Agent, Douglas Vass, Wheeling, W. Va.

BIG FOUR CLAY CO., THE
PR—G. O. French.........Canton, 0.
TR—G. B. French, " "
GM—G. O. French, " "
PA—G. B. French, " "
GS—R. W. Sharer,........Malvern, 0.
MS—Joe Keister..........Minerva, 0.
CE—L. D. Klotz......Waynesburg, 0.
Big Four Drift, Drift, No. 6 Seam, 40 in. thick.
PO—Malvern, O., SP—Oneida or Malvern, O., CTY—Carrol; RR—Penna. R. R.
MS—Joe Keister..........Minerva, 0.
S of H—Mules and rope.
S of M—Hand.
PP—Steam piped from Brick Plant boilers.
EMP—13. Last fiscal year output, 9,246 tons.
Big Four Slope, Slope, No. 5 Seam, 33 in thick.
PO—Malvern, O., SP—Oneida or Malvern, O., CTY—Carrol; RR— Penna R. R.
MS—Joe Keister..........Minerva, 0.
S of H—Mules and cable.
S of M—Hand.
PP—Steam piped from boilers at Brick plant.
EMP—12. Last fiscal year output, 5,029 tons.

BIG FOUR COAL CO.
Broadwell Mine, Drift.
PO—Broadwell, O.; SP—Same; CTY—Athens; RR—M. C. & C.
GM—J. A. Wells.......Broadwell, 0.
EM—J. A. Wells, " "
PA—D. J. Caslin, " "
MS—Dan. W. James. " "
S of H—Rope and mules.
S of M—Elec.
PP—250 volts, D. C.
(Old information.)

BIG FOUR MINING COMPANY.
Drift Mine; 60 to 84 in. thick.
PO—Carbon Hill, 0. SP—Same. CTY—Hocking. RR—Hocking Valley, Sand Run Br.
PR—Walter Crook....Carbon Hill, 0.
GS—Walter Crook, " "
MS—Walter Crook, " "
TR—Harry Wilkinson, " "
GM—Wm. Winigman, " "
S of H—Horses and 1 elec. loco.
S of M—2 elec. mach.
PP—4 pumps. Purchase power.
EMP—30. Last fiscal year output 4,000 tons.
Successors to Central Hocking Coal Co.

BIG VEIN COAL CO.
General Office, 1257 Leader Bldg., Cleveland, O.
Garside Mine, Shaft, Seam 5 ft. thick.
PO—Salineville, O.; SP—Same; CTY—Columbiana; RR—Penna.
PR—A. W. Osborne......Cleveland, 0.
TR—W. L. Robinson, " "
GM—T. G. Brooks......Cleveland, 0.
PA—S. L. Thompson " "
MS—W. P. Crookstan...Salineville, 0.
EE—E. G. Schubert, " "
EM—F. E. Hanlon........Barton, 0.
S of H—Mules and 1 elec. loco., track gauge 44 in.
S of M—5 elec. mach.
PP—2 Erie return tubular boilers, total 300 H. P., 550 volts D. C.
EMP—210.

BIXLER-OHIO COAL CO.
General Office, Columbus, 0.
Cochran No. 2 Mine; Drift; No. 8 Seam, 48 in. thick.
PO—Baileys Mills, O.; SP—Same; CTY—Belmont; R—B. & O.
PR—R. H. Evans........Zanesville, 0.
TR—J. C. McVey........Columbus, 0.
PA—J. C. McVey, " "
GM—J. E. Jones, " "
GS—J. E. Jones, " "
EM—E. L. Elkins........Bellaire, 0.
MS—Wm. Beynon....Baileys Mills, 0.
S of H—2 Elec. loco. and mules; track gauge, 42 in.
S of M—5 Elec. mach.
PP—2 Boilers, total 350 H. P., 1 gen. unit, 250 volts D. C., 1 pump.
EMP—100.
Sales Agent, Ira Bixler, Pittsburg, Pa.

BLACK DIAMOND CO. (THE)
General Office, Columbus, Ohio.
Black Diamond Mine, Drift, Pittsburgh Seam No. 8; 84 to 96 in. thick.
PO—Lathrop, Ohio, SP—Same, CTY—Athens; RR—M. C. and C. R. R.
PR—J. H. Earnshaw.....Columbus, 0.
TR—Henry L. Gilbert....Columbus, 0.
GM—Henry L. Gilbert, " "
PA—Henry L. Gilbert, " "
MS—Geo. W. Chambers....Lathrop, 0.
EM—Arthur Anderson......Athens, 0.
SCO—Gorham Store Co., Lathrop, 0.
S of H—2 Elec. loco., track gauge 42 in.
S of M—7 Elec. machines.
PP—3 Return tubular Union Iron Works boilers, total 450 H. P., 2 gen. units, 250 volts D. C., 1 pump.
EMP—169. Coke ovens 50 Bee Hive. Last fiscal year output, 82,000 tons.

BLACKSON & MILLER.
Blackson & Miller Mine; Drift; 46 in. thick.
PO—Coshocton, O.; SP—Same; CTY—Coshocton; RR—W. L. E.
MS—Perry Blackson.......Coshocton, 0.
S of H—Mules.
S of M—Hand.
EMP—12.

BLAIR, A. G., MINING CO., (THE)
General ffOice, Toledo, Ohio.
Majestic Mine, Drift, Pittsburgh No. 8 Seam, 5 ft. thick.
PO—Blairmont, O., SP—Same, CTY—Harrison; RR—W. & L. E. RR.
PR—A. G. Blair, Jr........Toledo, 0.
GM—J. C. Blair .... " "
GS—J. C. Blair .... " "
PA—S. C. Cripe, " "
MS—J. A. Wonnacott, Blairmont, Ohio
EM—Wm. Hibbs ....Scio, 0.
EE—Oscar McNottan.....Blairmont, 0.
SCO—Hastings Mdse. Co., Adena, 0.
Auditor—F. W. Crabbs......Toledo, 0.
S of H—Mules, and 2 elec. loco., track gauge 42 in.
S of M—8 Elec. mach.
PP—4 boilers, 2 Gen. units 250 volts D. C., 3 pumps.
EMP—190. Last fiscal year output 29,000 tons.
Sales Agents, A. G. Blair Co., Toledo, 0.

BLOOMFIELD MINING CO.
Wellston, 0. No report.

BLUE JAY COAL CO. (THE)
General Office, Wellston, Ohio.
Burr Oak Mine, Slope, Sedalia No. 7 Seam, 53 in. thick.
PO—Corning, O.; SP—Burr Oak, O.; CTY—Perry, RR—T. & O. C.
PR—H. A. Goddard.....Wellston, 0.
TR—C. E. Littler, " "
GM—W. S. McCloud, " "
PA—W. S. McCloud, " "
EM—E. R. Kelly..........Wellston, 0.
MS—Edward Dempsey......Corning, 0.
S of H—Mules, track gauge 42 in.
S of M—3 Elec. mach.
PP—2 return tubular boilers, total 300 H. P., 1 gen. unit 250 volts D. C., 1 pump.
EMP—35.

BLYTH COAL CO. (THE)
See Jean Coal Mining Co.

BOWEN, R. W., COAL CO.
Bowen Mine Drift; No. 6 Seam, 48 in. thick.
PO—Millersburg, O.; SP—Killbuck, O.; CTY—Holmes; RR—P. R. R., Hardy Br.
GM—R. W. Bowen......Millersburg, 0.
PA—R. W. Bowen, " "
MS—R. W. Bowen, " "
S of H—Mules; track gauge, 34 in.
S of M—Hand.
EMP—12. Last fiscal year output, 3,000 tons.

B. R. COAL & MINING CO.
General Office, Nelsonville, Ohio.
Drift Mine; No. 6 Hocking Valley Seam, 48 to 60 in. thick.
PO—Carbon Hill, Ohio; SP—Same; CTY—Hocking RR—H. V., Dorr Run Br.
PR—S. P. Booth........Columbus, 0.
TR—G. D. Ridenour....Nelsonville, 0
PA—G. D. Ridenour, " "
GM—G. W. Ross......Carbon Hill, 0.
S of H—Mules.
S of M—1 Elec. mach.
EMP—6.
Output about 50 tons per day.

BRETTELL BROS.
Brettell Mine; Drift; Pittsburgh No. 8 Seam; 54 to 60 in. thick.
PO—Mingo Junction, O.; SP—Same; CTY—Jefferson; RR—P. R. R.
GM—Thos. Brettell, Jr., Mingo Junction, 0.
PA—Thos. Brettell, Jr., " " "
GS—Thos. Brettell, Jr., " " "
MS—E. J. Brettell, " " "
EM—Jas. Bowers......Weirton, W. Va.
SCO—Address the company. Buyer, Thos. Brettell, Jr., Mingo Station, 0.
S of H—1 Elec. loco. and mules.
S of M—1 Elec. mach.
PP—Power purchased.
EMP—40. Last fiscal year output 12,000 tons.
Sales Agent, Thos. Brettell, Jr.

BROOKER COAL COMPANY.
General Office, Murray, 0.
Drift Mine; No. 6 Seam; 120 in. thick.
PO—Murray, O.; SP—Same; CTY—Hocking; RR—H. V., Coalgate Br.
GM—George Brooker Murray, 0.
MS—Geo. H. Brooker " "
S of M—Hand.
EMP—5. Last fiscal year output 12,000 tons.

BROWN BROS.
Brown's Mine, Drift; 3 ft. 8 in. thick.
PO—New Philadelphia, O., CTY—Tuscarawas.
GM—R. G. Brown, New Philadelphia, 0.
MS—R. G. Brown, " "
S of H—Mules; track gauge 30 in.
S of M—1 Comp. air mach.
PP—1 air comp.; 1 pump. Purchase power.
EMP—7. Last fiscal year output 10,008 tons.

BROWNE COAL CO (THE)
Browne No. 2 Mine; Slope.
PO—Wellston, O.; SP—Cornelia, O.; CTY—Jackson; RR—D. T. & I.
GM—J. H. Browne.......Wellston, 0.
PA—J. H. Browne, " "
EM—Edward Kelly, " "
MS—David Sanders " "
EE—Wm. Yarrington, " "
S of H—Mules and 1 elec. loco.
S of M—5 Elec. mach.
PP—2 boilers, total 300 H. P., gen. unit, 250 volts D. C.
(Old information.)

BUCHER BROTHERS.
Ridge Road Mine; Drift; No. 6 or Middle Kittanning Seam; 44 to 60 in. thick.
PO—New Philadelphia, 0; SP—Same; CTY—Tuscarawas; RR—C. P.
PR—Lewis Bucher, New Philadelphia, 0.
MS—Samuel Bucher, " "
S of H—Mules.
S of M—Hand.
PP—Two pumps.
EMP—10. Last fiscal year output 18040 tons.

BUCKEYE COAL CO.
Garrett Mine; Slope; No. 6 Seam; 96 to 120 in. thick.
PO—Shawnee, O.; SP—Same; CTY—Perry; RR—B. & O., Shawnee Div.
MS—Wm. R. James........Shawnee, 0.
S of H—Mules.
S of M—Hand.
EMP—4.

BURLINGTON COAL CO.
Burlington Mine; Slope; Pittsburgh No. 8 Seam; 58 to 68 in. thick.
PO—Martins Ferry, O.; SP—Same; CTY—Belmont; RR—P. R. R., B. & O., W. & L. E.
PR—E. K. DeLancy, Martins Ferry, 0.
TR—Louis H. Helling, " " "
GM—Louis H. Helling, " " "
PA—Louis H. Helling, " " "
EM—Carl Lash, " " "
S of H—Mules. Track gauge 33 in.
S of M—1 Elec. mach.
PP—2 gen. units, 250 volts D. C., 1 pump.
EMP—7. Last fiscal year output 5,150 tons.

BURR OAK COAL CO.
General Office, New First National Bank Bldg., Columbus, 0.
Burr Oak Mine; Slope; No. 7 Up. Freeport Seam, 54 to 60 in. thick.
PO—Burr Oak, O.; SP—Palos, O.; CTY—Athens; RR—K. & M., T. O. C. Br.
PR—H. D. Shepard.....Columbus, Ohio
GM—H. D. Shepard, " "
TR—I. R. Denon, " "
GS—J. M. Murday,......Glouster, Ohio
MS—J. M. Murday, " "
S of H—Mules.
S of M—1 Elec. mach.
PP—2 Water tube boilers, total 500 H. P., 2 pumps.
Last fiscal year output, 50,000 tons.
Sales Agency, Blue Jay Coal Co.

BURTON-TOWNSEND CO.
General Office, Zanesville, 0.
Monitor No. 1 Mine; Drift; No. 6 Seam, 42 in. thick.
PO—S. Zanesville, O.; SP—Darlington, O.; CTY—Muskingum; RR—Penna., Zanesville Div.
PR—R. C. Burton......Zanesville, 0.
TR—C. A. Case, " "
GM—C. A. Case, " "
PA—C. A. Case, " "
MS—Enos Miller......S. Zanesville, 0.
EE—W. H. Stallsmith " "
EM—P. S. Sniffen......Nelsonville, 0.
S of H—4 Elec. loco.; track gauge, 42 in.
S of M—8 Elec. mach.
PP—Power purchased.
EMP—123. Last fiscal year output 92,788.35 tons.

CALLAHAN COAL CO.
Greenamyer Shaft Mine; Seam No. 3.
PO—Salem, O., R. D. No. 6; SP—Salem, O.; CTY—Columbiana.
GM—Homer Callahan.......Salem, 0.
MS—Homer Callahan, " "
S of H—Mules.
S of M—Hand.
PP—1 return tubular boiler.
EMP—12. Last fiscal year output, 6,500 tons.

CAMBRIA CLAY PRODUCTS CO.
Brisk Hollow Mine; Drift; No. 5 Seam; 30 to 36 in. thick.
PO—Blackfork, O.; SP—Same; CTY—Lawrence; RR—B. & O., S. W.
PR—D. D. Davis........Oak Hill, 0.
TR—S. P. Reitz........Blackfork, 0.
PR—S. P. Reitz, " "
PA—S. P. Reitz, " "
PP—1 pump. Power purchased.
S of H—Mules; track gauge, 36 in.
S of M—Hand.
EMP—15.

CAMBRIA MINING CO. (THE)
General Office, Toledo, Ohio.
PR—Geo. M. Jones........Toledo, 0.
TR—T. B. Earl, " "
PA—T. B. Earl, " "
GM—L. O. Lougee, " "
CE—O. S. Jones, " "
GS—John Collins.........Bellaire, 0.
Sales Agent, The Geo. M. Jones Co., Toledo, O.
Pultney Mine, Slope, Pittsburgh No. 8 Seam, 5 to 6 ft. thick.
PO—Bellaire, O., SP—Same, CTY—Belmont; RR— C. & P.
MS—J. E. Stoltz..........Bellaire, 0.
S of H—4 elec. loco. Track gauge 40 in.
S of M—11 elec. mach.
PP—1 water tube and 2 return tubular boilers, total 400 H. P., 1 gen. unit 250 volts D. C., 2 pumps.
EMP—400.

Webb Mine, Shaft, Pittsburgh No. 8 Seam, 5 to 6 ft. thick.
PO—Bellaire, O. SP—Webb, O. CTY—Belmont. RR—C. & P.
MS—A. Burger ....Bellaire, 0.
S of H—1 elec. loco., track gauge 40 in.
S of M—10 elec. mach.
PP—1 gen. unit 250 volts D. C., 1 pump.
EMP—200.

CAMBRIDGE COLLIERIES CO., (THE)
General Office, Cleveland, 0.
PR—A. A. Augustus....Cleveland, 0.
TR—E. J. Hanglin, " "
GM—C. D. Jury, " "
PA—A. B. Oliver, " "
GS—H. E. Cameron......Cambridge, 0.
EM—W. L. Bomsberger, " "
EE—W. H. Davis, " "

Coal Ridge Mine; Shaft; No. 7 Seam, 4 to 6 ft. thick.
PO—Cambridge, O. SP—Coal Ridge, O. CTY—Guernsey; RR— Penna. Lines, C. & M. Div.
S of H—3 Elec. loco., track gauge 42 in.
S of M—7 Elec. mach.
PP—3 Return tubular boilers. 3 gen. units 250 volts D. C., 3 pumps.
EMP—275.

Caldwell Mine, Shaft, No. 7 Seam 4 to 6 ft. thick.
PO—Cambridge, O. SP—Caldwell, O. CTY—Guernsey; RR— Penna. Lines, C. & M. Div.
S of H—4 Elec. loco., track gauge 42 in.
S of M—8 Elec. mach.
PP—4 Return tubular boilers, 3 gen units 250 volts D. C., 4 pumps.
EMP—275.

Buffalo, Ideal, Trail Nos. 1 and 2 Mines, Shaft, No. 7 Seam, 4 to 6 ft. thick.
PO—Cambridge, O. SP—Byesville, O. CTY—Guernsey; RR— Penna. Lines, C. & M. Div.
S of H—14 Elec. loco., track gauge 42 in
S of M—30 Elec. mach.
PP—16 Return tubular boilers, 9 gen. units 250 volts D. C., 14 pumps.
EMP—1040

Banner and Walhonding, No. 2 Mines, Shaft, No. 7 Seam, 4 to 6 ft. thick.
PO—Cambridge, O., SP—Pleasant City, O., CTY—Guernsey; RR— Penna. Lines, C. & M. Div.
S of H—8 Elec. loco., track gauge 42 in.
S of M—16 Elec. mach.
PP—6 Return tubular boilers, 3 gen. units 250 volts D. C., 8 pumps.
EMP—358.

Blue Bell Mine, Shaft, No. 7 Seam, 4 to 6 ft. thick.
PO—Cambridge, O., SP—Opperman, O., CTY—Guernsey; RR—B. & O., Eastern Ohio.
S of H—3 Elec. loco., track gauge 42 in
S of M—7 Elec. mach.
PP—3 Return tubular boilers, 2 gen. units 250 volts D. C., 3 pumps.
EMP—218.

Hartford Mine, Shaft, No. 7 Seam, 4 to 6 ft. thick.
PO—Cambridge, O., SP— Buffalo, O., CTY—Guernsey; RR—B. & O., Eastern Ohio.
S of H—3 Elec. loco., track gauge 42 in.
S of M—7 Elec. mach.
PP—3 Return tubular boilers, 3 gen. units 250 volts D. C., 3 pumps.
EMP—180.

CANAAN COAL CO., (THE)
Canaan Mine, Shaft, Middle Kittanning Seam, 5 to 8 ft thick.
PO—Canaanville, O., SP—Same, CTY—Athens. RR—B. & O. Southwestern.
PR—John E. Jones........Jackson, O.
TR—Lewis V. Brown....Canaanville, O.
CM—Lewis V. Brown, " "
PA—Lewis V. Brown, " "
GS—James Allen, " "
EM—R. Rowland, " "
MM—C. E. Elder, " "
EE—C. E. Elder, " "
SCO—The Canaan Coal Co., Buyer, H. R. Larimer., Canaanville, O.
S of H—Mules, and 4 elec. locos., track gauge 42 in.
S of M—7 Elec. mach.
PP—2 B. & W. water tube and 5 H. T. boilers, total 1050 H. P., 3 gen. units, 250 volts D. C., 1 pump.
EMP—325. Last fiscal year output 200,000 tons.

CAPTINA COAL CO.
Captina Mine, Shaft; "Pittsburgh No. 8" Seam; 6 ft. thick.
PO—Amstrong Mills, O;. SP—Captina, O.; CTY—Belmont; RR—O. R. W., Narrow gauge.
PR—Hunter Armstrong.
TR—John E. Barth..Armstrong Mills, O.
GM—Wm. Rennie, " "
S of H—Mules, track gauge 36 in.
S of M—2 elec. mach.
PP—2 Return tubular boilers, total 120 H. P., 1 gen. unit, 250 volts, D. C.; 3 pumps.
EMP—22. Last fiscal year output 20,000 tons.

CARD & PROSSER COAL CO, (THE)
General Office, Garfield Bldg , Cleveland, Ohio.
TR—Fredrick Thressel, 328 Citizens Bldg., Cleveland, O.
GM—C. T. Brooks, 1201 Leader Bldg., Bldg., Cleveland, O.
GS—Thomas Morrison........Lisbon, O.
PA—Thomas Morrison, " "
EM—H. C. Armstrong, " "
CE—H. C. Armstrong, " "

Peerless Mine, Slope, No. 3 Seam.
PO—Lisbon, O.; SP—Same; CTY—Columbiana. RR—Erie.
MS—J F. Waters........Lisbon, O.
S of H—Rope.
S of M—Hand.
PP—2 boilers, total 250 H. P.
EMP—85.

West Pittsburgh No. 3 Mine; Drift; No. 6 Seam; 36 to 72 in. thick.
PO—Teegarden, O.; SP—West Pittsburgh, O.; CTY—Columbiana; RR—Erie.
MS—David Lewis..........Lisbon, O.
S of H—Mules and 2 elec. loco. Track gauge 37 in.
S of M—4 Elec. mach.
PP—2 return tubular boilers, total 300 H. P., 2 gen. units, 275 volts D. C., 2 pumps.
EMP—70. Last fiscal year output 60,000 tons.

Clay Mine, Shaft, No 3 Clay Seam.
PO—Lisbon, O.; SP—Same; CTY—Columbia; RR—Erie & P. L. & W.
MS—Thomas Morrison......Lisbon, O.
S of H—Mules. Track gauge, 38 in.
S of M—Hand.
PP—3 Erie City Return tubular boilers, total 400 H. P., 2 gen. units.
EMP—27. Last fiscal year output 56,000 tons.

CARBONDALE COAL CO., THE
General Office, Chillicothe, Ohio
PR—Richard Enderlin....Chillicothe, O.
TR—J. H. Greenbaum....Chillicothe, O.
SEC—E. W. Strong....Cincinnati, O.
GM—Richard Enderlin....Chillicothe, O.
EM—M. H. Doolittle....Carbondale, O.
GS—M. H. Doolittle, " "
PA—M. H. Doolittle, " "
SCO—Carbondale Coal Co., General Store Buyer, John Milar, Carbondale, O.

Carbondale No. 2 Mine, Drift, No. 6 Seam, 6 ft. 2 in. thick.
PO—Carbondale, O., SP—Same, CTY—Athens; RR—B. & O. S. W.
MS—R. Ford Doolittle..Carbondale, O.
S of H—4 elec. locos., track gauge 42 in.
S of M—7 elec. mach.
PP—4 Return tubular, Erie City boilers, total 400 H P., 2 gen. units 250 volts D. C., 3 pumps.
EMP—260. Last fiscal year output, 89,000 tons.

CARNEGIE STEEL CO. (COAL MINING DEPT.)
General Office, Pittsburgh, Pa.
Drift Mine; Pgh. No. 8 Seam, 57 to 75 in. thick.
PO—Bellaire, O.; SP—Same; CTY—Belmont; RR—Penna. and B. & O.
PR—H. D. Williams.....Pittsburgh, Pa.
TR—W. C. McCausland " "
PA—J. M. Taylor, " "
GS—G. E. Wisener, ...Bellaire, O.
MS—B. F. Marling, " "
EM—E. Bond, " "
MM—William Siddall, " "
EE—John Cooper, " "
S of H—1 Elec., 1 steam loco and mule. Track gauge 42 in.
S of M—4 elec. mach.
PP—4 Gen. units each 250 volts D.C.
EMP—75. Last fiscal year output 113,095 tons.

CAVANAUGH & BIGHOUSE
Clay Run Mine; Drift; No. 4 Seam; 38 to 48 in. thick.
PO—Zaleski, O.; SP—Same; CTY—Vinton; RR—B. & O. S. W.
MS—Geo. Cavanaugh,......Zaleski, O.
S of H—Mules. Track gauge 42 in.
S of M—Hand.
EMP—8.

CENTRAL HOCKING COAL CO.
See Big Four Mining Co.

CHAPMAN COAL COMPANY.
General office, Jackson, O.
PR—H. L. Chapman, . Columbus, O.
TR—C. J. Benton,......Jackson, O.
GM—C. J. Benton, " "
PA—C. J. Benton, " "
MS—C. J. Benton, " "

Grace Mine; Shaft; No. 2 Seam; 32 to 36 in. thick.
PO—Jackson, O; SP—Same; CTY—Jackson; RR—D. T. & I. and H. V
S of H—Mules and 2 elec, locos. Track gauge 42 in.
S of M—6 elec. machs.
PP—3 Atlas return tubular boilers, total 300 H. P., 1 gen. unit, 250 volts D. C., 5 pumps.

Chapman Mine; Drift; No. 2 Seam; 32 to 36 in. thick.
PO—Jackson, O; SP—Same; CTY—Jackson; RR—D. T. & I. and H. V.
MS—C. J Benton, Jackson, O.
S of H—Mules.
PP—2 return tubular boilers, total 150 H. P. 1 pump.
EMP—35. Last fiscal year output 10,000 tons.
Note—Formerly operated by the Hayes Coal Co.

CLEVELAND-BELMONT COAL COMPANY
General Office, 505 Republic Bldg., Cleveland, O.
Virginia Hill Mine; Slope; Pittsburgh No. 8 Seam; 62 in. thick.
PO—Lafferty, O.; SP—Same; CTY—Belmont; RR—B. & O., C. L. & W.
PR—A. W. Ellenberger....Cleveland, O.
TR—E. E. Teare, " "
GM—R. A. Groch, " "
GS—T. J. Jordan.........Lafferty, O.
PA—T. J. Jordan, " "
EM—D. A. Elkins, " "
EE—Marco Rurian, " "
S of H—7 elec. locos.
S of M—7 elec. mach.
PP—3 Erie City return tubular boilers. total 450 H. P., 2 gen. units, 250 volts D. C, 1 pump.
EMP—150.
Daily output, 1000 tons.
Note—Successors to Virginia Hill Coal Co.

CLEVELAND. CANTON COAL CO.
General Office, Canton, O.
C. Goshen Mine, Drift, No. 6 Seam, 48 to 52 in thick.
PO—New Phialdelphia, O.; SP—Same CTY—Tuscarawas; C. & P.
PR—A. M. Byers..New Philadelphia, Pa.
GM—D. P. Loomis.........Canton, O.
PA—E. C. Howard..New Philadelphia, O.
GS—E. C. Howard, " "
MS—E. C. Howard, " "
CE—Geo. Stemple, " "
EM—Geo. Arnold, " "
EE—Geo. Stemple, " "
S of H—4 elec. loco. and mules. Track gauge 39 in.
S of M—7 elec. mach.
PP—3 water tube boilers, total 300 H. P., gen. unit, 250 volts D. C., 2 pumps.
EMP—110. Last fiscal year output 50,000 tons.
Successors to New Philadelphia Coal & Mining Co.

CLIFFORD COAL COMPANY
Clifford Mine; Slope; Pittsburgh No. 8 Seam; 68 to 75 in. thick.
PO—Moundsville, W. Va.; SP—Dille, O.; CTY—Belmont; RR—C. & P., P. O. V. & C.
PR—A. R. Budd.......Pittsburgh, Pa.
TR—A. H. Stolenzbach " "
PA—T. J. Demme, " "
CE—Geo. A. Baton, " "
MS—W. A. Smitherman, Moundsville, W. Va.
SCO—Dille Store Co., Moundsville, W.Va.
S of H—6 elec. locos. Track gauge 42 in.
S of M—9 elec. mach.
PP—4 return tubular boilers, total 600 H. P., 2 gen. units, one 250 volts, one 150 volts, 3 pumps.
Note—Successors to Fort Pitt Coal Co.

CLIFTON COAL CO., THE
Now Laurel Hill Coal Co.

CLOVER LEAF COAL COMPANY
Clover Leaf Mine; Shaft; No. 5 Seam; 44 in. thick.
PO—Mineral City, O., R. F. D. No. 1; SP—Same; CTY—Tuscarawas; RR—B. & O.; Ruff Run branch.
PR—H. O. Ray, R. D. No. 1, Mineral City, O.
PA—H. O. Ray, R. D. No. 1, Mineral City, O.
MS—George Ray, R. D. No. 1, Mineral City, O.
EE—George McCarty, " "
S of H—Mules. Track gauge 36 in.
S of M—2 elec. mach.
PP—2 Russell return tubular boilers total 200 H. P., 2 pumps.
EMP—20. Last fiscal year output, 9,600 tons.

COLBURGH COAL CO. (THE)
General Office, Columbus, O.
Media Mine, Drift, No. 8 Pittsburgh Seam, 5 ft. thick.
PO—Baileys Mills. SP—Same. CTY—Belmont. RR—B. & O.
PR—E. M. Poston.......Columbus, O.
GM—E. M. Poston, " "
TR—C. W. Thompson..... " "
PA—C. W. Thompson..... " "
GS—Edward Lynch ...Baileys Mills, O.
MM—Wm. Booth, " "
EE—Joe Perkins, " "
CE—J. L. Murphy......Nelsonville, O.
S of H—4 elec. loco. Standard gauge.
S of M—7 Elec. mach.
PP—2 return tubular Atlas Hafner boilers, total 300 H. P., 2 gen. units. 250 volts D. C. and 2 pumps.
EMP—135. Last fiscal year output 132,000 tons. Sales agents, New York Coal Co., Columbus, O.

COLUMBUS COAL MNG. CO. (THE)
Franklin No. 2 Mine, Drift, Middle Kittanning Seam, 2½ to 4 ft. thick.
PO—Coshocton, O. SP—Tyndall, O. CTY—Coshocton. RR—P. C. C. & St. L., Franklin Branch.
PR—Francis N. Barnes..Coshocton, O.
TR—Clyde F. Barnes.... " "
GM—Francis N. Barnes... " "
GS—Rollin N. Barnes... " "
PA—Clyde F. Barnes... " "
MS—J. S. Kitchen, R. F. D. 5, Coshocton, O.
S of H—Mules. Track gauge 32 in.
S of M—Hand.

CONTINENTAL COAL CO.
N. D. Monsarrat, Receiver.
General Office, Columbus, Ohio.
No. 207 Mine; Drifts; No. 6 Seam, 48 to 72 in. thick.
PO—Nelsonville, O.; SP—Same; CTY—Athens; RR—H. V.
MS—Thos. Burns......Nelsonville, O.
S of H—2 Elec. and 1 Steam loco., and mules; track gauge 42 in.
S of M—7 Elec. mach. and hand.
PP—5 boilers, total 750 H. P., gen. units 250 volts D. C., 5 pumps.
EMP—267.

No. 209 Mine; Shaft; No. 6 Seam, 36 to 72 in. thick.
PO—Poston, O.; SP—Same; CTY—Athens. RR—H. V.
MS—Wm Altman..........Athens, O.
S of H—Elec. loco. and horses; track gauge 42 in.
S of M—7 Elec. mach.
PP—2 boilers, total 300 H. P., gen. unit 250 volts D. C., 2 pumps.
EMP—92.

No. 211 Mine; Shaft; No. 6 Seam, 36 to 72 in. thick.
PO—Poston, O.; SP—Same; CTY—Athens; RR—H. C.
MS—Wm. Pritchard........Poston, O.
S of H—3 Elec. loco. and horses; track gauge 42 in.
S of M—8 Elec. mach.
PP—5 Return tubular boilers, total 750 H. P., gen. units 250 volts D. C., and 5 pumps.
EMP—312.

No. 254 Mine; Shaft; No. 6 Seam, 60 in. thick.
PO—Jacksonville, O.; SP—Same; CTY—Athens; RR—T. & O. C.
MS—John McDonald.......Glouster, O.
S of H—Mules, rope and 1 Elec loco.; track gauge 36 in.
S of M—7 Elec. mach.
PP—3 boilers, total 450 H. P., gen. unit 250 volts D. C., and 4 pumps.
EMP—262.

No. 255 Mine; Shaft; No. 6 Seam, 60 in. thick.
PO—Modoc, O.; SP—Same; CTY—Athens; RR—T. & O. C.
MS—Harry Colley..........Modoc, O.
S of H—Mules and 2 Elec. loco.; track gauge 42 in.
S of M—7 Elec. mach.
PP—3 boilers, total 450 H. P., gen. unit 250 volts D. C., and 4 pumps.

EMP—292.

No. 256 Mine; Shaft; No. 6 Seam, 60 to 72 in. thick.
PO—Glouster, O.; SP—Same; CTY—Athens; RR—T. & O. C.
Dist. Supt—D. H. Williams..Glouster, O.
MS Harry Cunningham, " "
S of H—Mules and 3 Elec. loco.; track gauge 36 in.
S of M—11 Elec. mach.
PP—4 boilers, total 600 H. P., 2 gen. units 250 volts D. C., 7 pumps.
EMP—375.

No. 266 Mine; Shaft; No. 6 Seam, 72 in. thick.
PO—Hollister, O.; SP—Same; CTY—Athens; RR—T. & O. C.
Dist Supt—D. H. Williams..Glouster O.
MS—John Collins.........Hollister, O.
S of H—Mules and 2 Elec. loco.; track gauge 42 in.
S of M—7 Elec. mach.
PP—2 Return tubular boilers, toal 300 H. P., 2 gen. units 250 volts D. C. and 6 pumps.
EMP—256.

No. 267 Mine; Slope; No. 6 Seam, 48 to 72 in. thick.
PO—Hunterton, O.; SP—Same; CTY—Athens; RR—T. & O. C.
Dist. Supt—D. H. Williams..Glouster, O.
MS—John Yaw...........Glouster, O.
S of H—2 Elec. loco. and mules; track gauge 42 in.
S of M—7 Elec. mach.
PP—3 boilers, total 450 H. P., gen. units 250 volts D. C., and 4 pumps.
EMP—321.

No. 268 Mine; Slope; No. 6 Seam, 48 to 120 in. thick.
PO—Rendville O. SP—Same. CTY—Perry. RR—T. & O. C.
MS—Andrew Wilson.......Corning, O.
S of H—Elec. loco. and mules.; track gauge 42 in.
S of M—7 Elec. mach.
PP—3 Boilers, total 450 H. P., gen. units 250 volts D. C. and 2 pumps.
EMP—318.

No. 281 Mine; Shaft; No. 6 Seam, 60 in. thick.
PO—Modoc, O.; SP—Same; CTY—Athens; RR—T. & O. C.
MS—Carl Fierce............Modoc, O.
S of H—Mules and 2 Elec. loco.; track gauge 42 in.
S of M—8 Elec. mach.
PP—3 Return tubular boilers, total 450 H. P., 2 gen. units 250 volts D. C. and 7 pumps.
EMP—314.

No. 301 Mine; Shaft; No. 6 Seam, 96 to 120 in. thick.
PO—Congo, O.; SP—Same; CTY—Perry; RR—Z. & W.
MS—J. J. Murray..........Congo, O.
S of H—3 Elec. loco. and mules; track gauge 42 in.
S of M—10 Elec. mach.
PP—4 boilers, total 600 H. P., gen. units 250 volts D. C. and 7 pumps.
EMP—391.

No. 302 Mine; Shaft; No. 6 Seam, 96 to 120 in. thick.
PO—Congo, O.; SP—Same; CTY—Perry; RR—Z. & W.
MS—A. Penman............Congo, O.
S of H—Mules and 2 Elec. loco.; track gauge 42 in.
S of M—6 Elec. mach.
PP—Boiler, 150 H. P., gen. units 250 volts D. C. and 2 pumps.
EMP—356.

CORNING MINING CO. (THE)
Mine No. 26, Slope, Hocking No. 6 Seam, 48 to 108 in. thick.
PO—Corning; SP—Same; CTY—Perry; RR—T. & O. C.
PR—Geo. F. German.......Corning, O.
GM—Geo. F. German, " "
MS—Chas. Precst, " "
S of H—1 elec. loco. Track gauge 42 in.
S of M—3 elec. mach.
PP—2 return tubular boilers, total 300 H. P., 1 gen. unit 250 volts D. C., 2 pumps.
EMP—100. Sales agents, The Geo. M. Jones Co., Toledo, O.

CRAIG COAL CO.
Hocking Domestic No. 6 Mine; Drift; No. 6 Seam; 48 to 72 in. thick.
PO—Nelsonville, O.; SP—Same CTY—Athens; RR—H. V.
PR—C. W. Craig.......Nelsonville, O.
GM—C. W. Craig, " "
MS—C. W. Craig, " "
TR—E. P. Lama, " "
S of H—1 elec. loco.
S of M—2 elec. mach.
PP—1 Hainey return tubular boiler, 250 H. P., gen. unit, 250 volts A. C., 1 pump.
EMP—20. Last fiscal year output 24,000 tons.
Sales agency, Hocking Domestic Coal Co.

CROWN COAL CO.
Crooksville, O. No report.

DAVIS, DAVID
Tyrone Mine, Drift, No. 6 Seam, 3½ to 4½ ft. thick.
PO—Conesville, O. SP—Same. CTY—Coshocton. RR—C. A. & C. Ry.
PR—David Davis ......Conesville, O.
GM—David Davis ...... " "
PA—David Davis ...... " "
MS—Jas. Larr .... " "
S of H—Mules. Track gauge 36 in.
S of M—1 comp. air mach.
PP—1 water tube boiler, 100 H. P., 1 pump, 1 air compressor.
EMP 40. Last fiscal year output 14,635 tons.
(Old information.)

DAVIS COAL COMPANY.
Dewey Mine; Drift; No. 8 Seam; 48 to 108 in. thick.
PO—New Straitsville, O; SP—Same; CTY—Perry; RR—H. V.
PR—Wm. Hammill, .New Straitsville O.
TR—Wm. J. Davis, " " "
PA—John Cheetham, New Straitsville, O.
MS—Wm. Abram, " " "
CE—Sunday Creek Co. New Straitsville, O.
S of H—Horses. Track gauge 56½ in.
S of M—1 elec. mach.
PP—Purchase power.
EMP—13. Last fiscal year output, 15,000 tons.

DAVIS FIRE BRICK CO.
Davis Mine; Drift; No. 5 Seam, 36 to 48 in. thick.
PO—Oak Hill, O.; SP—Same; CTY—Jackson, O.; RR—B. & O.
PR—D. D. Davis..........Oak Hill, O.
TR—A. M. Davis, " "
PA—A. M. Davis, " "
GM—E. J. Davis, " "
CE—E. J. Davis, " "
S of H—Mules.
S of M—Hand.
PP—1 Return tubular boiler, 150 H. P., 1 air comp., and 2 pumps.
EMP—15 to 20. Last fiscal year output, 8,500 tons.

DECKMAN-DUTY BRICK CO.
General Office, Cleveland, O.
Sandy Valley Clay Mine, Drift, No. 6 Clay and Coal Seam, 34 in. thick.
PO—Malvern, O. SP—Same. CTY—Carroll. RR—Penna., Tuscarawas Branch.
PR—S. M. Duty......Cleveland, O.
GM—S. M. Duty...... " "
TR—H. C. Moatz...... " "
PA—H. C. Moatz...... " "
GS—F. E. Schultz........Wooster, O.
MS—J. C. Fisher.......Malvern, O.
CE—H. A. Ford .... " "
S of H—Mules. Track gauge 29 in.
S of M—Hand
EMP—20. Last fiscal year output, 5,000 tons.
Output consumed in Brick plant.

DEE WM. E. CLAY PRODUCTS COMPANY.
Slope Mine; No. 4 and No. 5 Seams; 50 in. thick.
PO—Oak Hill. O; SP—Same CTY—Jackson; RR—B. & O.
OWNER—Wm. E. Dee, 30 N. La Salle Street, Chicago, Ill.
OWNER—R. E. Miller,.....Oak Hill, O.
MS—C. D. Shepard, " "
S of H—Mules.
S of M—Hand.
Last fiscal year output, 5,500 tons.
Note—Output used in brick plant.

DETROIT & WELLSTON COAL CO.
Now Minglewood Coal Co.

DEXTER COAL CO.
See Goncher Mine Co.

DIAMOND COAL CO.
Lessee of Chapman Coal Co.
General office, Jackson, O.
Shaft Mine; No. 2 Seam; 30 to 33 in. thick;
PO—Jackson, O; SP—Same; CTY—Jackson; RR—D. T. & I. and H. V.
PR—David Armstrong, ...Jackson, O.
TR—J. M. Armstrong, " "
GM—Sherman Walker, " "
EM—Alph Jones,........ Chapman, O.
S of H—Mules. Track gauge 38 in.
S of M—Hand.
Formerly operated by Hayes Coal Co.

DOMESTIC COAL CO., THE
Domestic Mine; Shaft; No. 2 Jackson Seam.
PO—Wellston, O.; SP—Same; CTY—Jackson.
RR—D. T. & I.
PR—L. C. Voglesang......Wellston, O.
PA—L. C. Voglesang, " "
TR—L. C. Voglesang, " "
GM—L. C. Voglesang, " "
MS—C. Littlejohn, " "
EM—W. E. Lewis, " "
EE—Henry Gray, " "
S of H—1 Elec. loco. and mules; track gauge, 38 in.
S of M—7 Elec. mach.
PP—4 Return tubular boilers, total 400 H. P., gen. unit, 220 volts D. C., and 2 pumps.
EMP -140. Last fiscal year output 45,000 tons.
Sales manager, H. B. Carrucc, Wellston, O.

DOVER FIRE BRICK CO.
Dover Mine, Stripping, No. 5 Seam 2½ to 3 ft. thick.
PO—Strasburg, O. SP—Same—CTY—Tuscarawas. RR—B. & O.
PR—G. H. Ganson........Cleveland, O.
TR—H. E. Stuhler..... " "
PA—H. E. Stuhler, " "
GM—Geo. E. Bowen......Strasburg, O.
GS—Geo. E. Bowen, " "
MS—R. Bowen .... " "
S of H—Mules. Track gauge 34 in.
S of M—Hand.
EMP—2. Last fiscal year output 3,440 tons.

EAST HILL COAL CO. (THE)
General Office, Nelsonville, Ohio.
East Hill No. 4 Mine, Drift, Middle Kittanning or No. 6 Seam, 5 to 7½ ft. thick.
PO—Buchtel, O. SP—Same. CTY—Athens. RR—Hocking Valley, Snow Fork.
PR—John McMillen ......Buchtel, O.
TR—C. C. Sharp ....Nelsonville, O.
GM—John McMillen .....Buchtel, O.
GS—John McMillen ...... " "
PA—John McMillen ...... " "
EM—J. L. Murphy ....Nelsonville, O.
SCO—Gibson & Son. Buyer, W. H. Gibson, Nelsonville, O.
S of H—Mules and 1 elec. motor. Track gauge 42 in.
S of M—3 elec. mach.
PP—1 return tubular boiler, 150 H. P., 1 100 K. W. M.-G. Set, 250 volts D. C., 3 pumps.
EMP—98. Last fiscal year output 36,046 tons. Sales agent, W. A. Gosline & Co., Toledo, O.

EASTERN OHIO COAL CO.
PO—Canton, O.; CTY—Carroll.
No report.

EDGEFIELD COAL COMPANY.
General office, Canton, O.
Edgefield Mine; 54 to 66 in. thick.
PO—Canton, O; SP—Same; CTY—Stark;
GM—John Wynn, Sr., Canton, O.
MS—Edw. Wynn, " "
EM—G. H. Wynn, " "
EE—John Wynn, Jr., " "
S of H—Mules.
S of M—1 Jeffery elec. mach.
PP—Purchase power.

ELK COAL COMPANY (THE)
General Office, Columbus, Ohio.
Elk Mine Drift; No. 6 Middle Kittanning Seam; 42 to 48 in. thick.
PO—Roseville, O. SP—Same. CTY—Muskingum. RR—Penna Co., Zanesville Div.
PR—John W. Moore ....Columbus, O.
TR—John W. Moore .... " "
GM—John W. Moore .... " "
EM—C. H. Terry ....Nelsonville, O.
GS—Chas. B. Hall.......Columbus, O.
EE—W. E. Blosser......Roseville, O.
PA—E. E. Learned ....Columbus, O.
SEC—E. E. Learned .... " "
MS—Geo. E. McClelland...Roseville, O.
SCO—The Miners Co-operative Store Co. Buyer, C. M. Sanders, Roseville, O.
S of H—Mules and 2 elec. loco. Track gauge 35½ inches.
S of M—12 elec. machines.
PP—3 pumps. Power purchased. 500 volts, D. C.
EMP—175. Last fiscal year output, 118,067 ons. Sales agent, E. E. Learned, Columbus, O.

ELK FORK COAL CO.
General Office, Wellston, Ohio.
VP—Geo. B. Davis......Wellston, Ohio
TR—E. B. Blair " "
GM—Geo. B. Davis " "
GS—W. B. Montgomery " "
PA—Geo. B. Davis " "
CE—T. O. Davis " "
EM—E. A. Kelly " "
EE—Wm. Craw........McArthur, Ohio

Elk Fork No. 1; Shaft; No. 2 Vein; 28 to 32 ins. thick.
PO—McArthur, Ohio, R. F. D.; SP—Elk Fork; CTY—Vinton; RR—H. V. Ry.
MS—Jno. Kruiskamp.....Wellston, Ohio
SM—Jno. Cozad........Wellston, Ohio
S of H—5 elec. locos. 1 storage bat.
S of M—3 elec. mach.
PP—3 return tubular boilers, 3 pumps.
EMP—30. Last fiscal year output 12,000 tons.

Elk Fork No. 2; Shaft; No. 2 Vein, 32 in. thick.
PO—Wellston, Ohio; SP—Same; CTY—Jackson; RR— D. T. & I. Ry.
MS—W. B. Montgomery..Wellston, Ohio
S of H—5 elec. locos., 1 storage bat.
S of M—5 elec. mach.
PP—3 return tubular boilers.
EMP—80. Last fiscal year output 42,000 tons.

ELK RUN COAL CO.
Drift Mine; No. 6 Seam, 36 to 42 in. thick.
PO—Rogers, O.; SP—Same; CTY—Columbiana; HR—P. L. & W.
PR—Hugh Laughlin..East Palestine, O.
TR—A. P. Mullins........Salem, O.
GM—A. P. Mullins, " "
GS—Wm. Anderson, " "
PA—A. P. Mullins, " "
S of H—2 Elec. loco.
S of M—2 Elec. mach.
PP—2 Return tubular boilers, 240 H. P., 1 gen. unit, 250 volts D. C., 2 pumps.
EMP—75. Last fiscal year output 15,000 tons.

ELKINS COAL & COKE CO.
General Office, Bellaire, O.
Locust Mine; Slope; Pgh. No. 8 Seam; 48 to 60 in. thick.
PO—Flushing, O.; SP—Same; CTY—Belmont; RR—C. L. & W. and B. & O.
PR—C. Bruce Head.....St. Louis, Mo.
TR—C. S. Thomas, " "
GM—D. A. Elkin.........Bellaire, O.
PA—D. A. Elkin, " "
EM—R. G. Miller, " "
CE—G. H. McDonald, " "
MS—C. E. Lawson, ...Flushing, O.
S of H—1 Elec. loco track gauge 36 in.
S of M—4 Elec. mach.
PP—2 Return tubular boilers, total 200 H. P., 1 Gen. unit 250 volts D. C.
EMP—10. Last fiscal year output 2,100 tons.
Successors to the Buckeye Coal Co.

ELM ROCK COAL CO.
Elm Rock Mine, Drift, No. 6 Seam, 6 ft. thick.
PO—Nelsonville, O. SP—Same. CTY Athens. RR—Hocking Valley.
PR—B. Phillips ......Nelsonville, O.
GM—B. Phillips ...... " "
TR—M. Evans .... " "
PA—A. Robinson ..... " "
MM—A. Robinson ..... " "
MS—W. F. Con ...... " "
EE—A. McCollum ......Doanville, O.
EM—F. R. Baker ....Athens, O.
SCO—Imperial Store Co. Buyer, J. G. Guy, Doanville, O.
S of H—Mules and 1 elec. loco. Track gauge 42 in.
S of M—3 elec. machines.
PP—2 water tube boilers, 1 gen. unit, 250 volts, 3 pumps.
EMP—110. Sales agent, General Hocking Fuel Co., Columbus, O.
(Old information.)

EMMA COAL COMPANY
Drift Mine; 30 to 36 in. thick.
PO—Jackson, O.; SP—Same; CTY—Jackson; RR—D. T. & I.
PR—Edw. H. Zurhorst.....Jackson, O.
TR—Edwin James, " "
GM—Edwin James, " "
GS—Edwin James, " "
PA—Edwin James, " "
MS—John D. Richards, " "
EM—B. C. Bentley,
SCO—Emma Coal Co.
EMP—125.

ENGLISH HILL COAL COMPANY
General Office, Shawnee, Ohio.
Gibbs Mine; Drift; No. 7 Seam, 72 to 96 in. thick.
PO—Shawnee, Ohio; SP—Same; CTY—Perry; RR—Z. & W.
PR—Thomas Moulton, Sr., Shawnee, O.
TR—Edward B. Hopkins, " "
PA—Edward B. Hopkins, " "
GM—G. C. Davis, " "
GS—G. C. Davis, " "
MS—G. C. Davis, " "
S of H—Horses. Track gauge 42 in.
S of M—1 elec. mach.
PP—Purchase power.
EMP—4. Last fiscal year output 18,000 tons.

ESSEX COAL CO. (THE)
General Office, Columbus, Ohio.
PR—Calvin Essex ....Columbus, O.
TR—S. Cattingham, " "
GM—Calvin Essex ...... " "
PA—Fred Essex, " "
GS—Chas. S. Essex,.......Pomeroy, O.
CE—W.W. Knight, New Straitsville, "
MM—Wm. Chappelar, " "
EE—Wm. Chappelar, " "
SCO—Thomas Fork Store Co. Buyer, E. C. McKelvey, Pomeroy, Ohio.
Sales Mgr., Fred Essex, Columbus, O.

Esco Mine, Drift, No. 6 Seam, 6 to 10 ft. thick.
PO—New Straitsvilo, O. SP—Same CTY—Perry. RR—H. V.
MS—Robt. Essex, ..New Straitsville, O.
S of H—2 elec. loco. Track gauge 42 in.
S of M—6 elec. machines.
PP—2 return tubular boilers, total 300 H. P., 2 gen units 250 volts D. C., 4 pumps.

South Esco Mine, Drift, No. 6 Seam, 7 to 8 ft. thick.
PO—New Straitsville, O. SP—Same. CTY—Perry. RR—H. V.
S of H—2 elec. loco. Track gauge 42 in.
S of M—6 elec. machines.
PP—2 return tubular boilers, total 300 H. P., 2 gen. units, 250 volts D. C.

Calvin Mine; Drift; Redstone Seam, 72 in. thick.
PO—Pomeroy, O.; SP—Calvin, O.; CTY—Meigs; RR—K. & M.
MS—Chas. S. Essex......Pomeroy, O.
S of H—3 elec. locos. Track gauge 42 in.
S of M—3 Elec. mach.
PP—4 Erie water tube boilers, total 600 H. P., 3 gen. units, 250 volts D. C., 1 pump.
EMP—145.
Last fiscal year output, 120,000 tons.

Statler Mine; Redstone Seam, 54 in. thick.
PO—Pomeroy, O.; SP—Statler, O.; CTY—Meigs; RR—K. & M.
MS—Chas. S. Essex........Pomeroy, O.
S of H—3 elec. locos. Track gauge 42 in.
S of M—3 Elec. mach.
PP—Power from Calvin Mine.

EVANS CLAY MFG. CO.
Drift Mine; No. 6 Seam, 34 in. thick.
PO—Uhrichsville, O.; SP—Same; CTY—Tuscarawas; RR—B. & O. and P. C. C. & St. L.
PR—T. J. Evans......Uhrichsville, O.
TR—Eugene Evans, " "
MS—Walter McMillen, " "
S of H—Mules.
S of M—Hand.
EMP—32. Last fiscal year output 26,300 tons.

EVANS, T. J., COAL CO.
Evans Mine, Drift, No. 2 Jackson Seam.
PO—Coalton, O. SP—Same. CTY—Jackson. RR—C. H. & D.
GM—Ed. T. Evans.......Coalton, O.
GS—Ed. T. Evans....... " "
PA—Ed. T. Evans....... " "
MS—H. R. Kysor........ " "
SCO—T. J. Evans & Co. Buyer, E. L. Darling, Coalton, O.
S of H—Mules. Track gauge 3 ft.
S of M—Hand.
PP—1 Gem City return tubular boiler
EMP—75.

FAIRPOINT & W. VA. COAL CO.
Ideal Mine; Drift; 66 in. thick.
PO—Fairpoint, Ohio; SP—Same; CTY—Belmont; RR—B. & O.
PR—W. M. Dunlap......Fairpoint, O.
GM—William Betrum, " "
TR—F. Gable " "
PA—F. Gable, " "
GS—James Bertrum, " "
MS—James Bertrum, " "
EM—E. Elkins, " "
S of H—2 steam locos.
S of M—4 mach.
PP—2 pumps. Purchase power.
EMP—100.
Successors to F. L. Head Coal Co.

FAIRVIEW MINING CO.
General Office, Wabash Bldg., Pittsburg, Pa.
Rogers Mine; Drift; No. 6 Seam; 32 to 38 in. thick.
PO—Rogers; SP—Same; CTY—Columbiana; RR—P. L. & W.
PR—J. Bert Ross.......Buffalo, N. Y.
TR—J. Bert Ross, " "
VP—W. G. Rogers......Pittsburg, Pa.
GM—W. G. Rogers, " "
S of H—Mules.
Note—Idle during past year.

FEDERAL CLAY PRODUCT CO.
American Mine, Drift, No. 5 Seam.
PO—Mineral City, O. RR—B. & O.
PR—Geo. J. Markley..Mineral City, O.
TR—Geo. J. Markley, " "
GM—Geo. J. Markley, " "
PA—Geo. J. Markley, " "
EM—A. Addie, " "
MS—F. Harris, " "
SCO—Markley Big Store Co., Mineral City, O.
S of H—Mules.
S of M—Hand.
PP—3 boilers, total 260 H. P. gen. unit, 220 volts D. C.
Sales agent, F. Furgeson, Mineral City, O.

FEDERAL EIGHT COAL MINING CO.
General office, Nelsonville, O.
No. 18 Mine Slope; Pittsburg No. 8 Seam; 72 to 132 in. thick.
PO—Frost, O. SP—Big Run, O. CTY—Athens RR—M. C. & C.
PR—Parker S. Sniffen, ..Nelsonville, O.
TR—Parker S. Sniffen, " "
CE—Parker S. Sniffen, " "
GM—C. D. Spencer, " "
PA—C. D. Spencer " "
MS—C. D. Spencer, " "
SCO—Federal E. Store Co., Buyer, C. D. Spencer, Nelsonville, O.
S of H—Mules & Rope.
S of M—1 elec. Mach.
PP—1 Water Tube Boiler total 150 H. P., 250 volts D. C. 2 pumps.
EMP—35. Last fiscal year output 39,870 tons.
Note—Successors to L. & H. Coal Co.

FISHER, F. H.
Fisher Mine, Slope, No. 6 Seam.
PO—Zanesville, O. CTY—Muskingum.
PR—F. H. Fisher........Zanesville, O.
MS—F. H. Fisher, " "
S of H—Mules.

FLUSHING COAL CO. (THE)
General Office, Elyria, Ohio.
Tunnel Mine, Drift, No. 8 Seam, 36 to 51 in. thick.
PO—Flushing, O. SP—Same. CTY—Belmont. RR—B. & O.
PR—I. J. Faxon............Elyria, O.
TR—T. S. Faxon........ " "
GM—T. S. Faxon........ " "
PA—T. S. Faxon........ " "
GS—J. W. Whiston,.......Flushing, O.
EE—B. Ellis, " "
EM—R. P. Millard .....Cleveland, O.
S of H—Mules, 2 elec. loco. Track gauge 35½ in.
S of M—1 elec. mach., 4 compressed air machines.
PP—2 return tubular Erie boilers, total 250 H. P., 1 gen. unit, 250 volts D. C., 4 pumps, 1 air comp.
EMP—42. Annual output 30,000 tons. Sales agent, T. S. Faxon, Elyria, Ohio.

FORSYTHE COAL CO.
General Office, Cambridge, O.
PR—H. J. Forsythe......Cambridge, O.
TR—H. J. Forsythe, " "
GM—H. J. Forsythe, " "
PA—H. J. Forsythe, " "
GS—Wm. Sheehan, " "
MS—Wm. Sheehan, " "
EM—John W. Stewart, " "
MM—Paul Spaid, " "
EE—Ross Mitchell, " "
SM—H. J. Forsythe, " "

Forsythe Mine; Slope; No. 7 Seam 60 to 84 in. thick.
PO—Cambridge, O.; SP—Mineral Siding, O.; CTY—Guernsey; RR—B. & O.
S of H—Mules and 4 elec. loco. Track gauge 36 in.
S of M—8 elec. mach.
PP—4 return tubular boilers, total 500 H. P., Motor generator, 250 volts D. C., 2300 volts A. C., 3 phase 60 cycles, 4 pumps. Purchase power.
EMP—350. Last fiscal year output 201 000 tons.

Imperial Mine No. 1; Shaft; No. 7 Seam; 54 to 84 in. thick.
PO—Belle Valley. O.; SP—Same; CTY—Noble; RR—Penna.
S of H—Mules and 2 elec. loco. Track gauge 40 in.
S of M—7 elec. mach.
PP—3 return tubular boilers, total 450 H. P., 2 gen. units, 250 volts D. C., 1 pump.
EMP—150.

Imperial No 2 Mine, Shaft, No. 7 Seam, 60 to 84 in. thick.
PO—Derwent, O.; SP—Same; CTY—Guernsey; RR—Penna.
S of H—Mules and 3 elec. locos. Track gauge 40 in.
S of M—8 elec. mach.
PP—3 return tubular boilers, total 450 H. P., 2 gen. units, 250 volts D. C., 5 pumps.
EMP—250.

FRIEL, T. J., COAL CO.
T. J. Friel Mine; Slope; 108 in. thick.
PO—New Straitsville, O.; SP—Same; CTY—Perry; RR—Hocking Valley.
S of H—Mules.
S of M—Hand and elec. mach.
PP—250 volts D. C. Purchase power.
EMP—4. Last fiscal year output 6,000 tons.

GEIL COAL CO.
General Office, Ironton, O.
..Geil Mine; Drift; No. 5 Seam; 36 to 48 in. thick.
PO—Ironton, O.; CTY—Lawrence.
PR—Andrew Geil..........Ironton, O
TR—Andrew Geil, " "
MS—Andrew Geil, " "
CE—Fred Lete, " "
S of H—Mules.
S of M—Hand.
EMP—7. Last fiscal year output 7,000 tons.
Local Mine.

GEM COAL CO (THE)
Gem Mine, Drift, No. 6 Seam, 12 tc 6 ft. thick.
PO—Nelsonville, O. SP—Greendale. CTY—Hocking. RR—H. V.
PR—A. D. Knight.....Nelsonville, O.
TR—O. L. Aumiller.... " "
PA—O. L. Aumiller.... " "
GM—A. D. Knight.... " "
GS—A. D. Knight.... " "
S of H—Horses, 1 elec. loco. Track gauge 42 in.
S of M—4 elec. machines.
PP—2 return tubular boilers, Motor generator set, 250 volts D. C., 2 pumps.
EMP—175. Last fiscal year output 200,000 tons.

Sand Run Mine; Drift; No. 6 Seam; 84 in. thick.
PO—Nelsonville, O.; SP—Carbon Hill; CTY—Hocking; RR—H. V.
MS—W. C. Sanborn.....Nelsonville, O.
SCO—Aumiller & Knight, " "
S of H—Mules.
S of M—1 elec. mach.
PP—50 K. W. Motor gen. set, 250 volts D. C. Purchase power.
EMP—40.

GINN COMPANY, THE
General Office, Ironton, O.
Red Devil Mine; Drift; No. 5 Sheridan Seam.
PO—R. F. D. No. 2, Ironton, O.;SP—La Grange, O.; CTY—Lawrence; RR—D. T. & I.
PR—C. S. Ginn..........Ironton, O.
TR—C. W. Ginn, " "
GM—C. W. Ginn, " "
PA—C. W. Ginn, " "
MS—Leonard Schwab, " "
CE—Jas. T. Egerton, " "
SCO—La Grange Merc. Co. Buyer, C. W. Ginn, Ironton, O.
S of H—1 Elec. loco. and mules.
S of M—Hand.
EMP—50.

GLEN ROY COAL CO. (THE)
General Office, Jackson, O.
Glen Roy Mine, Slope, Jackson Hill No. 2 Seam; 32 to 36 in. thick.
PO—Jackson, O. SP—Coalton, O. CTY—Jackson. RR—Hocking Valley.
PR—Henry Pritchard ....Glen Roy, O.
GS—Henry Pritchard ..... " "
MS—Geo. Richards.........Coalton, O.
TR—E. O. Roberts, ...Jackson, O.
GM—O. S. Roberts ......Jackson, O.
PA—O. S. Roberts....... " "
S of H—Mules and elec. hoist.
S of M—3 elec. machines.
PP—Power purchased. 1 pump.
EMP—45. Last fiscal year output, 913,400 tons.

GLEN'S RUN COAL CO.
General Office, Cleveland, O.
GM—C. E. Maurer.....Cleveland, O.
PA—C. E. Maurer..... " "
GM—C. C. Maurer, " "
TR—C. E. Sullivan, " "
CE—R. Millard, " "

Edgar Nos. 1, 2 and 3 mines, Drifts, Pgh. No. 8 Seam, 4 ft. 8 in. tc 5 ft. thick.
PO—Dillonvale, O. SP—Same. CTY—Jefferson. RR—W. & L. E.
MS—C. W. Maurer......Dillonvale, O.
S of H—5 elec. loco. and mules. Track gauge 42 in.
S of M—14 elec. mach.
PP—5 return tubular boilers, 2 gen. units, 250 volts D. C.
EMP—350.

Rush Run Nos. 3 and 4 Mines, Drifts, Pgh. No. 8 Seam; 54 to 70 in. thick
PO—Rush Run, O. SP—Same. CTY—Jefferson. RR—P. R. R.
MS—C. W. Maurer......Dillonvale, O.
S of H—5 elec. loco.
S of M—12 elec. machines.
PP—4 return tubular boilers.
EMP—280.

GLOBE COAL CO, THE
Consol Mine No. 513; Drift; No. 6 Seam, 72 to 96 in. thick.
PO—Murray, O.; SP—Consol; CTY—Hocking; RR—H. V,; Brushfork br.
PR—E. W. Davis..........Murray,. O.
GS—E. W. Davis, " "
GM—E. W. Davis, " "
TR—Vance Webb, " "
PA—L. P. Mooney, " "
S of H—Horses.
S of M—1 Elec. mach.
PP—Gen. unit, 250 volts A. C., 1 pump. Purchase power.
EMP—30. Last fiscal year output 20,690 tons.

GLOBE IRON CO.
Globe Mine; Shaft; No. 1 Seam 42 to 54 in. thick.
PO—Jackson, O. SP—Same. CTY—Jackson. RR—B. & O. S. W.
PR—Eben Jones..........Jackson, O.
TR—John E. Jones, " "
GM—John E. Jones.......Jackson, O.
GS—John E. Jones, " "
PA—Morris Wheldon .... " "
EM—A. E. Campbell .... " "
MM—Albert Dobbins, " "
EE—W. J. Lamb, " "
MS—R. Lewis .... " "
SCO—Globe Store. Buyer, Carl F. Forsythe, Jackson, Ohio.
S of H—Elec. loco. and mules.
S of M—5 elec. mach.
PP—3 return tubular boilers, 450 H. P 2 gen. units, 250 volts D. C., 3 pumps.
EMP—58. Last fiscal year output, 38,500 tons.

GOSHEN COAL CO. (THE)
Seven mines in Ohio.
PR—C. L. Cassingham..Cleveland, O.
TR—W. S. Hayden ...... " "
Asst TR—P. R. Burnett... " "
SEC—P. R. Burnett ..... " "
GM—C. L. Cassingham... " "
GS—E. Ankney..New Philadelphia, O.
PA—Miss A. I. Lane.. " "
EM—C. R. Thrapp, " "
Sales Mgr., J. W. Canavan, Cleveland, Ohio.
"C" Mine, Drift, No. 6 Seam, 4 to 5 ft. thick.
PO—New Philadelphia, O. SP—Roswell, O. CTY—Tuscarawas. RR—C. & P. Div. Penna R. R., Tuscarawas Branch.
S of H—4 elec. loco. Track gauge 39 in.
S of M—Pick and 6 elec. machines.
PP—3 return tubular boilers, 2 gen. units, 250 volts D. C.
EMP—150.

"F" Mine, Drift, No. 6 Seam, 3 ft. 8 in. to 5 ft. thick.
PO—New Philadelphia, O. SP—Joyce, O. CTY—Tuscarawas. RR—C. & M. Div., Penna R. R.
S of H—1 leec. loco. Track gauge 39 in.
S of M—Pick and 4 elec. mach.
PP—2 return tubular boilers, 1 gen. unit, 250 volts D. C.

"G" Mine, Drift, No. 6 Seam, 4½ to 5 ft. thick.
PO—New Philadelphia, O. SP—Roswell, O. CTY—Tuscarawas. RR—C. & P. Div., P. R. R. Tuscarawas Branch.
S of H—Rope. Track gauge 39 in.
S of M—Pick.
PP—2 return tubular boilers, 1 gen. unit, 500 volts D. C.
All other mines idle.
(Old information.)

GOSHEN CENTRAL COAL CO. (THE)
General Office, Massillon, Ohio.
Goshen Central Mine, Drift, No. 6 Seam. 42 to 48 in. thick.
PO—New Philadelphia, O.; SP—Same; CTY—Tuscarawas; RR—Beaver Dam Branch, C. & P. Div., Penna lines.
PR—E. E. Fox ....Massillon, O.
GM—E. E. Fox .... " "
TR—J. M. Seese .... " "
MS—Edward Swier..New Philadelphia, O
EE—Chas. Schlafley, " "
SM—Chas. Wenger, " "
S of H—Mules and 3 elec. loco. Track gauge 42 in.
S of M—7 elec. machines.
PP—4 return tubular boilers, total 350 H. P., 250 volts D. C., 3 pumps.
EMP—100. Last fiscal year output 76,258 tons.

GOSHEN RIDGE COAL COMPANY.
Goshen Ridge Mine; Drift; No. 6 Seam; 60 in. thick.
PO—New Philadelphia, O; SP—Same; CTY—Tuscarawas; RR—Penn'a; C. & P. Branch.
PR—W. K. Moon, 415 N. 3d St., New Philadelphia, O.
TR—Alfred J. Dale, 415 N. 3d. St. New Philadelphia, O.
SECY—John Williams, 304. N. Broadway, New Philadelphia, O.
S of H—Mules.
S of M—Hand
EMP—30. Last fiscal year output, 30,000 tons.

GOSHEN VALLEY MINES.
Nos. 3 and 6 Mines; Drifts; No. 6 Seam, 54 to 60 in. thick.
PO—Beidler, O.; SP—Midvale, O.; CTY—Tuscarawas; RR—B. & O., Wainwright and Goshen Valley Br.
PR—Herman C. Schneider, New Philadelphia, O.
TR—Herman C. Schneider, New Philadelphia, O.
GM—Herman C. Schneider, New Philadelphia, O.
PA—Herman C. Schneider, New Philadelphia, O.
MS—Albert Schneider, New Philadelphia, O.
EM—Geo. E. Arnold, New Philadelphia, O.
S of H—Mules.
S of M—Hand.
EMP—65. Last fiscal year output 58,000 tons.

"E" Mine; Shaft; No. 6 Seam, 50 to 54 in. thick.
PO Rosswell, O.; SP New Philadelphia, O.; CTY—Tuscarawas; RR—Penna., Bayard Br.
S of H—Mules and rope. Track gauge 39 in.
S of M—3 elec. mach.
PP—3 Erie water tube boilers, 2 gen. units, 2 pumps.
Just developing. Expect to begin shipping 300 tons daily, Sept. 1st.

GOSLINE, W. A., & CO.
General Office, Toledo, Ohio.
Bear Run Mine, Shaft, No. 6 Seam, 3½ ft. thick.
PO—New Lexington. SP—Goston, O. CTY—Perry. RR—C. A. & C.
PR—W. A. Gosline, Jr.....Toledo, O.
GM—W. A. Gosline, Jr..... " "
PA—W. A. Gosline, Jr..... " "
GS—E. W. Lewis..New Lexington, O.
S of H—1 elec. loco.
S of M—8 elec. machines.
PP—2 water tube boilers, total 300 H. P., 175 K. W., 2 pumps.
EMP—125.

GOUCHER MINE COMPANY
General Office, 2406 1st Natl. Bank Bldg. Pittsburgh, Pa.
Goucher Mine; Drift; Pittsburgh No. 8 Seam; 48 to 54 in. thick.
PO—Brilliant, O.; SP—Same; CTY—Jefferson; RR—Penna., C. & P. Div., Goucher Br.
PR—G. C. Bucey.........Brilliant, O.
PA—G. C. Bucey, " "
MS—G. C. Bucey, " "
TR—T. Jenkins.........Pittsburgh, Pa.
S of H—Mules and 1 elec. loco. Track gauge 38 in.
S of M—6 elec. mach.
PP—2 pumps. Purchase power.
Note—Successors to Dexter Coal Co.

GREAT NORTHERN SEWER PIPE CO. (The)
Great Northern Mine; Slope.
PO—Empire, O.; CTY—Jefferson; RR—C. & P.
GM—C. M. Stratton........Empire, O.

GREER-BEATTY CLAY CO. (THE)
Greer-Beatty Mine, Drift, No. 5 Seam, 3 ft. 8 in. thick.
PO—Magnolia, O.; SP—Same; CTY—Carroll; RR—Penna. Co.
PR—W. H. Greer.......Magnolia, O.
TR—R. E. Greer .... " "
MS—Joseph Degenhard ... " "
S of H—Mules.
S of M—Hand.
EMP—10. Annual output 10,525 tons.

HALL COAL CO.
Coshocton, O. No report.

HALLEY COAL CO. (THE)
Nos. 2 and 3 Mines; Drift; No. 5 Seam; 42 to 48 in. thick.
PO—Pedro, O.; SP—Etna Station, O.; CTY—Lawrence; RR—D. T. & I.
PR—D. D. Davis........Oak Hill, O.
TR—F. W. Allard..........Pedro, O.
GM—F. W. Allard, " "
PA—P. L. Hummel, " "
CE—P. L. Hummel, " "
MS—George Woods, " "
MM—Roberts Sutton, " "
SM—John S. Thomas, " "
EM—Fred Leet...........Ironton, O.
S of H—Mules and 1 gasoline loco. Track gauge 36 in.
S of M—Hand.
PP—1 Pump.
EMP—125. Last fiscal year output 300,000 tons.
Sales Agent, F. W. Allard, Pedo, O.

HANNA-ESSEX COAL CO. (THE)
General Office, New Straitsville, O.
Essex Mine; Slope; No. 6 Seam, 72 in. thick.
PO—Hemlock, O.; SP—Carrington, O.; RR—N. Y. C., Z. & W. Div.
PR—H. H. Essex..New Straitsville, O.
GS—H. H. Essex, " " "
TR—N. S. Essex, " " "
PA—N. S. Essex, " " "
MS—Eugene Essex........Hemlock, O
EM—Wade Knight..New Straitsville, O.
S of H—1 Elec. loco.; track gauge, 41 in.
S of M—2 Elec. mach.
PP—1 boiler, 1 pump. Buy power.
EMP—152.
Output 600 tons daily capacity.
Sales Agency, Geo. M. Jones Co., Toledo, O.

HARBISON-WALKER REFRACTORIES CO.
General Office, Pittsburg, Pa.
One Mine in Ohio, 2 Mines in Penna., 1 in Kentucky.
PO—Scioto Furnace, O.; RR—B. & O., S. W.; CTY—Scioto.
PR—H. W. Croft......Pittsburg, Pa.
TR—Wm. Walker, " "
PA—C. T. Stewart, " "
Mine coal for their own use.

HAMBLETON BROS.

Hambleton Mine; Dift, No. 1 Seam, 36 to 48 in. thick.
PO—Wadsworth, O.; SP— Same; CTY—Medina.
GM—George Hambleon,...Wadsworth, O.
PA—George Hambleon, " "
MS—T. Hambleton,
S of H—Mules.
S of M—Hand.
EMP—7. Last sfical year output 3,312 tons.
Local mine.

HANGING ROCK IRON CO.

New Castle Mine, Drift, No. 5 Seam.
PO—Hanging Rock, O. SP—Royersville, Ohio, and Hanging Rock, Ohio. CTY—Lawrence. RR — Roysersville, O., on D. T. & I. Ry and Hanging Rock, O., on N. & W. Ry. Both connect with mine by tram road.
PR—D. B. Meacham.....Cincinnati, O.
TR—J. R. Houston.... " "
GM—J. K. Pollock ....
GS—W. M. Jeffreys..Hanging Rock, O.
PA—W. M. Jeffreys.. " "
CE—F. G. Leete ....Ironton, O.
MS—Wm. Dickens ..Hanging Rock, O.
SCO—Pine Grove Store. Buyer, W. J. Brown, Hanging Rock, O.
S of H—Mules.
S of M—Hand.

HOCKING BLOCK COAL CO.

General Office, Columbus, O.
Central Mine; Drift; No. 6 Seam; 72 to 120 in. thick.
PO—New Straitsville, O.; SP—Same; CTY—Perry; RR—Hocking Valley.
PR—D. L. Wallace...New Straitsville, O.
TR—S. Cottingham.......Columbus, O.
GM—S. Cottingham, " "
PA—S. Cottingham,
GS—D. L. Wallace..New Straitsville, O.
S of H—2 Elec. loco.; track gauge, 42 in.
S of M—6 elec. mach.
PP—Purchase power.

HOCKING DOMESTIC COAL CO

General Office, Nelsonville, Ohio.
PR—J. M. Lama .....Nelsonville, O.
TR—E. R. Lama ..... " "
PA—E. R. Lama...... " "
GM—J. M. Lama...... " "
CE—Parker Sniffen, " "
SCO—J. M. Lama.....

Domestic No. 5 "Redbird," Drift, Pomeroy Seam, 4 to 5 ft thick.
PO—Cheshire, O., R. D. SP—Middleport. O. CTY—Meigs. RR—Hocking Valley.
MS—Thomas Matheny..Middleport, O.
S of H—1 elec. loco. Track gauge 38 in.
S of M—5 elec. mach.
PP—1 return tubular boiler, 1 gen. unit, 250 volts D. C.
EMP—150.

Domestic No. 6, Drift, No. 6 Seam, 8 to 5½ ft. thick.
PO—Nelsonville, O. SP—Floodwood, O. CTY—Athens. RR—Hocking Valley.
MS—Gerry Hamilton.....Nelsonville, O.
SM—Geo. Wraith ... " "
S of H—1 elec. loco. Track gauge 42 in.
S of M—2 elec. mach.
PP—2 pumps, 1 water tube Heine boiler, 1 gen. unit, 250 volts D. C.
EMP—80. Last fiscal year output for both mines, 125,000 tons.

HOCKING MINING CO. (THE)

General Office, Athens Ohio.
Del Carbo Mine, Slope, No. 6 Seam, 4½ ft. thick.
PO—Carbondale, O. SP—Mineral, O. CTY—Athens. RR—B. & O. S. W.
PR—C. D. Hopkins........Athens, O.
TR—C. D. Hopkins........ " "
GM—C. D. Hopkins........
PA—C. D. Hopkins........Athens, O.
EM—Arthur Anderson ..... " "
GS—G. W. Arnold....Carbondale, O.
MM—W. F. Glesecke, " "
EE—John Hanula......Carbondale, O.
SM—F. C. Betts .... " "
S of H—Mules and 4 elec. loco. Track gauge 42 in.
S of M—8 elec. machines.
PP—3 Atlas return tubular boilers, total 450 H. P., 250 volts D. C., 4 pumps.
EMP—180. Last fiscal year output 80,865 tons.

HOCKING VALLEY FIRE CLAY CO.

Hocking Valley Clay Mine, Drift, No. 5 Seam, 8 ft. thick.
PO—Nelsonville, O. CTY—Athens.
MS—Chas. Ray.......Nelsonville, O.
S of H—Horses.
EMP—12.
Note—Mine only for own use.

HOCKING VALLEY PRODUCTS CO.

General Office, Harrison Bldg., Columbus, Ohio.
PR—D. E. Reagan .....Columbus, O.
TR—F. J. Shaffer, " "
PA—F. J. Shaffer, " "
SECY—F. J. Shaffer ..... " "
GS—W. J. Barry..New Straitsville, O.
EM—W. J. Barry, " "
GS—(Clay Product Plants) E. B. Francis, Greendale, O.
SCO—Ohio Trading Co....Columbus, O.
Sales Mgr. (Coal) A. P. DeVennish, Columbus, O.

Nos. 1 and 1a Mines, Drift and Slope, 6 and 7 Seams.
PO—Doanville, O. SP—Same. CTY—Athens. RR—H. V.
S of H—Elec. loco. and rope.
S of M—Elec. mach.
PP—4 boilers, gen. units, D. C.
EMP—500.

No. 3 Mine, Drift, No. 6 Seam.
PO—Shawnee, O. SP—Same. CTY—Perry. RR—B. & O.
S of H—Rope.
S of M—Elec. mach.
PP—4 boilers, gen. unit D. C.
EMP—100.

Central and Gem Mines, Drift, No. 6 Seam.
PO—New Straitsville, O. SP—Same. CTY—Perry. RR—H. V.
S of H—Elec. loco.
S of M—Elec. mach.
PP—8 boilers, gen. units D. C.
EMP—750.

Nos. 21 and 23 Mines, Drifts, No. 6 Seam.
PO—Buchtel, O. SP—Same. CTY—Athens. RR—H. V.
S of H—Elec. loco.
S of M—Elec. mach.
PP—4 boilers.
EMP—200.
Nos. 9, 35, 37, 49 and 51 Mines, Drifts, No. 6 Seam.
PO—New Straitsville, O. SP—Same. CTY—Perry. RR—H. V.
S of H—Horses.
S of M—Hand.
EMP—90.

Nos. 53, 31 Mines, Drifts. No. 6 Seam.
PO—Buchtel, O. SP—Same. CTY—Athens. RR—H. V.
S of H—Horses.
S of M—Hand.
EMP—30.

Nos. 107, 109, 111 Mines, Drifts, No 6 Seam.
PO—New Straitsville, O. SP—Same. CTY—Perry. RR—H. V.
S of H—Horses.
S of M—Elec. mach.
EMP—45.

No. 105 Mine, Drift, No. 6 Seam.
PO—New Straitsville, O. SP—Sand Run, O. RR—H. V.
S of H—Horses.
S of M—Elec. mach.
PP—Gen. units D. C.
EMP—30.

No. 29 Mine, Drift, No. 6 Seam.
PO—Murray, O. SP—Same. CTY—Hocking. RR—H. V.
S of H—Horses.
S of M—Hand.
EMP—10.

HOLDEN CLAY PRODUCTS CO.

South Side Mine.
PO—Mineral City, O.; SP—Same; CTY—Tuscarawas; RR—B. & O.
GM—Geo. J. Markley, Mineral City, O.
PA—Geo. J. Markley, " " "

HOPEDALE COAL COMPANY

General Office, Oliver Bldg., Pittsburgh, Pa.
Stripping Mine; Pittsburgh No. 8 Seam; 60 in thick.
PO—Hopedale, O.; SP—Parlett, O.; CTY—Harrison; RR—W. P. T.
GM—H. B. Salkeld, ...Pittsburgh, Pa.
PA—H. H. Salkeld, " "
MS—P. P. Sexton........Hopedale, O.
S of H—1 steam loco.
S of M—2 steam shovels.
EMP—30.

HORGER-HELDT COAL COMPANY

General Office, New Philadelphia, O.
H. and G. Mines; Drift; No. 6 Seam 4½ ft. thick. (G. Mine formerly operated by Goshen Coal Co.)
PO—Roswell, O.; SP—Same; CTY—Tuscarawas; RR—Penna., C. & P. Div.
PR—J. U. Horger, New Philadelphia, Pa.
TR—C. Heldt, " " "
GM—J. U. Horger, " " "
MS—J. U. Horger, " " "
MM—J. U. Horger, " " "
PA—N. C. Parr, " " "
CE—Geo. Arnold, " " "
EM—Geo. Arnold, " " "
EE—A. A. Smith, " " "
SM—J. C. Thomas, " " "
S of H—Mules, rope and 1 elec. loco. track gauge 39 in
S of M—Hand and 5 elec. mach.
PP—2 Boilers, total 250 H.P., 1 Gen. unit, 250 volts D. C., 2 pumps.
EMP—150. Last fiscal year output, 75,000 tons.
Sales Agency, W. Va. & O. Coal & Coke Co., Cleveland, O.

HUTCHINSON COAL CO.

General Office, Fairmont, W. Va.
8 Mines in West Virginia, 1 Mine in Ohio.
Kirkwood Mine, Drift, Pittsburgh No. 8 Seam, 4½ to 5½ ft. thick.
PO—Bridgeport, O. SP—Same. CTY—Belmont; RR—B. & O.
PR—M. L. Hutchinson, Fairmont, W.Va
TR—C. H. Jenkins ... " "
GM—C. H. Jenkins ... " "
GS—C. J. Ryan ..... " "
PA—M C. Lough.
MS—William Heller....Bridgeport, O
S of H—1 Elec. loco., track gauge 42 in.
S of M—7 Elec. mach.
PP—2 Return tubular boilers, total 300 H. P., 250 volts D. C., 2 Pumps.
EMP—172. Last fiscal year output, 54,679 tons. Mine idle about 9 months on account of strike.

HARPER COAL CO.

Harper Mine; Slope; Seam 30 to 48 in. thick.
PO—Coalton, O. SP—Davisville, O. CTY—Jackson. RR—D. T. & I.
PR—J. E. Harper ......Coalton, O.
GM—J. E. Harper ...... " "
PA—J. E. Harper ...... " "
TR—G. E. Christman... " "
MS—J. C. Rowe........
S of H—Mules and rope.
S of M—Hand.
PP—1 Return tubular boiler, 100 H. P. 1 gen. unit and 3 pumps.
EMP—35. Last fiscal year output 11,000 tons.

HAYES COAL CO

Springfield Mine.
See Diamond Coal Co.

Grace & Chapman Mines.
See Chapman Coal Co.

HISYLVANIA COAL CO. (THE)

General Office, Columbus. O.
Hisylvania Mine; Slope; No. 6 Seam 60 in. thick.
PO—Trimble, O. SP—Same. CTY—Athens; RR—K. & M.
PR—J. W. Blower ......Columbus, O.
TR—J. W. Blower ...... " "
GM—J. W. Blower......Columbus, O.
PA—J. W. Blower, " "
GS—E. M. Blower..........Trimble, O.
MS—Charles Jonas........Glouster, O.
EM—F. R. Baker ....Athens, O.
MM—C. F. Jones ......Glouster, O.
S of H—Rope, Mules and 3 elec. loco. Track gauge 42 in.
S of M—8 electric machines
PP—6 return tubular boilers, 250 volts D. C., and 5 pumps.
EMP—300.

HITE, EDWARD

Laughlin Mine; Drift: Ohio No. 8 Seam; 60 to 78 in. thick.
PO—Martins Ferry, O.; SP—Same; CTY—Belmont; RR—Penna., B. & O., W. & L. E.
PR—Edward Hite.....Martins Ferry, O.
S of H—Mules and 1 elec. loco. Track gauge 36
S of M—4 elec. mach.
PP 2 pumps. Purchase power.
EMP—81. Last fiscal year output 90,000 tons.
Note—Lessee of American Sheet & Tin Plate Co.

HOBSON COAL CO.

Black Cat Mine; Drift No. 8 "A" Seam; 54 to 72 in. thick.
PO—Rutland. O.; SP—Middlesport, O. CTY—Meigs; RR—K. & M.
PR—W. E. Williams......Rutland, O.
GM—W. E. Williams, " "
PA—W. E. Williams, " "
TR—B. S. Williams, " "
EM—A. Sheldon, " "
MS—J. C. Trew, " "
S of H—Mules; track gauge 38½ in.
PP—1 Pump.
EMP—38. Last fiscal year output,
S of M—1 Jeffrey Elec. mach.
15,000 tons.

HUTCHISON COAL COMPANY.

Star Mine Slope; No. 1 or Massillon Seam 36 to 60 in. thick.
PO—Wadsworth. O: SP—Same CTY—Medina; RR—Erie.
PR—J. J. Hutchinson, ..Wadsworth, O
TR—Wm. Hutchinson, " "
GM—Michael Hutchinson, " "
MS—J. F. Malaney, R. D. No. 2. Wadsworth, O
S of H—Mule. Track gauge 36 in.
PP—2 Biggs return tubular boilers, total 150H. P., 1 gen. unit, 1 pump.
EMP—6. Last fiscal year output, 4300 tons.

HUTSON COAL CO. (THE)

General Office, Cleveland, O.
PR—H. D. Marble .... Cleveland, O.
TR—H. D. Marble, " "
GM—H. D. Marble, " "
PA—H. D. Marble, " "
GS—T. J. Williams,....Deerfield, O.
EM—H. D. Lewis......Hopedale, O.

Deerfield No. 4, Shaft, No. 1 Seam, 3 ft. 9 in. thick, operate washery.
PO—Deerfield, O., SP—Same, CTY—Portage; RR—N. Y. C. Alliance Div.
MS—T. J. Williams......Deerfield, O.
S of H—Mules and 3 storage battery loco., track gauge 37 in.
S of M—Pick and 2 elec. mach.
PP—4 water tube boilers, 4 pumps.
EMP—130. Last fiscal year output 64,340 tons.

Hopedale No. 9 Mine; Drift; No. 8 Seam; 56 in. thick.
PO—Hopedale, O., SP—Same, CTY—Harrison. RR—W. P. T. Ry.
MS—H. D. Lewis........Hopedale, O.
S of H—Mules, track gauge 37 in.
S of M—2 elec. mach.
PP—1 Erie return tubular boiler, 2 pumps.
EMP—6. Last fiscal year output 42,000 tons.

Deerfield No. 10 Mine; Shaft; No. 1 Seam; 45 in. thick.
PO—Deerfield; SP—Same; CTY—Portage; RR—N. & C.; Alliance branch.
MS—T. J. Williams.......Deerfield, O.
PP—3 return tubular boilers.
EMP—8. Output 1,000 tons.
Note—Mine not working at present.

INDIAN HILL COAL CO. (THE)

Indian Hill Mine, Drift, 4 to 4 ft. 8 in. thick.
PO—Uhrichsville, O. SP—Same. CTY—Tuscarawas; RR—Penna. R. R.
PR—H. P. Arnt.......Cleveland, O.
TR—A. W. Dean, " "
GM—P. Townsend, " "
PA—A. J. Wiegand, " "
CE—R. P. Millard,......Cleveland, O.
MS—Dennis Reichman...Tuscarawas, O.
S of H—Mules and 2 elec. loco., track gauge 35 in.
S of M—4 Elec. mach.
PP—1 McGregor return tubular boiler, 150 H. P., 1 gen. unit 250 volts D. C., 1 pump.
EMP—90. Last fiscal year output, 35,000 tons. Sales Agents, Pittsburgh & Ohio Mining Co., Cleveland, O.

INGHAM BROS.

Ingham Mine; Drift; No. 6 Seam, 34 to 56 in. thick.
PO—Coshocton, O.; SP—Same; CTY—Coshocton; RR—W. & L. E.
GS—John Ingham........Coshocton, O
S of H—Mules.
S of M—Hand.
EMP—40. Last fiscal year output, 18,000 tons.

ISLAND RUN COAL CO.

East Liverpool, O. No report.

JACKSON COAL CO.

Thomas and Davis Mines; Drift; Nos. 4 and 5 Seams, 36 to 55 in. thick.
PO—Oak Hill, O.; SP—Same; CTY—Jackson; RR—B. & O.
PR—A. E. Howell........Oak Hill, O
TR—A. E. Howell, " "
GM—A. E. Howell, " "
PA—A. E. Howell, " "
MS—Murley Bates, " "
S of H—Mules.
S of M—Hand.
PP—1 Pump.
EMP—24. Last fiscal year output 17,487 tons.

JACKSON IRON & STEEL CO., (THE)

Jisco Mine, Shaft, Wellston No. 1 Seam, 2 to 3 ft. thick.
PO—Jackson, O., SP—Same, CTY—Jackson; RR—D. T. & I., B. & O. S. W.
PR—Simon Labold........Jackson, O.
TR—J. F. Morgan, " "
GM—J. F. Morgan, " "
PA—J. S. Morgan, " "
MS—Dave Ridge, " "
MM—Roy Brunner, " "
SM—Maurice Smith, " "
S of H—Mules.
S of M—Hand.
PP—1 Return tubular boiler, 2 Pumps.
EMP—50. Last fiscal year output 32,562 tons. Output used in blast furnace.

JACKSON & WEST VIRGINIA FUEL CO.

General Office, Dayton, O.
McKitterick Mine, Drift; Jackson Seam; 3½ ft. thick.
PO—Oak Hill, O., R. F. D. No. 1. SP—McKitterick, O.; CTY— Jackson; RR—C. H. & D.

PR—V. E. Hall..........Dayton, O.
GM—V. E. Hall. “ “
TR—Frank J. Hall, “ “
PA—Frank J. Hall, “ “
GS—E. E. Brohard,....Oak Hill, O.
SM—E. M. Flowers, “ “
CE—Fred Leete..........Ironton, O.
ME—Edw. Kelly.........Wellston, O.
S of H—Mules.
S of M—Hand.
EMP—50. Last fiscal year output 35,000 tons.

JAMES & CO.
Now Buckeye Coal Co.

JAMES BROS. COAL CO.
502 Alliance Bank Bldg. Alliance, Ohio.
James Mine; Drift; Middle Kittanning or No. 6 Seam; 46 to 48 in. thick.
PO—Magnolia, O. SP—Mineral City, O.; CTY—Carroll; RR—B. & O., Huff Bun branch.
PR—J. H. Bottomy.......Massillon, O.
GS—Chas. Owens..........Dell Roy, O.
MS—Chas. Owens, “ “
MM—T. Cope.............Alliance, O.
CE—T. Cope, “ “
SM—Richard James, “ “
TR—Richard James, ...Alliance, O.
CE—Wm. Hibbs, ...Scio, O.
S of H—Mules.
S of M—2 Elec. mach. and hand.
PP—1 Erie return tubular boiler, 75 H. H., 1 gen. unit, 250 volts D. C.
EMP—20. Last fiscal year output 8,000 tons.
Sales Agency, Vankirk Coal Co., Mineral City, O.; and Bixler C. & C. Co., Pittsburgh, Pa.

JAMES COAL CO.
Wadsworth, O. No report.

JEAN COAL MINING COMPANY.
General office, Cleveland, O.
Jean Mine; No. 8 Pittsburgh Seam: 60 in. thick.
PO—Brilliant, O. SP—Salt Run. CTY—Jefferson RR—C. & P.
PR—B. C. Tucker,.......Cleveland, O.
TR—H. L. Forstbauer, ” ”
GS—J. S. O'Neill, ...Brilliant, O.
PA—J. S. O'Neill, ” ”
S of H—2 elec. locos.
S of M—elec. machs.
Daily output 700 tons.
Sales Agents;—Lake City Coal Co., 1001-1004, Rockefeller Bldg, Cleveland Ohio.
Note—Successors to Blyth Coal Co.

JEFFERSON COAL CO.
General Office, Cleveland, O.
PR—John E. Newell....Cleveland, O.
TR—John E. Newell, “ “
SECY—Edw. F. Bowler, “ “
GM—John Simpson........Bellaire, O.
PA—Robt. I. Simpson......Cleveland, O.
EM—J. B. Headley....Piney Fork, O.
MM—Alex. Datrick, Piney Fork, O., and Thomas Griffith, Harperville, O.
SCO—Piney Fork Supply Co., Piney Fork, O., and Harperville Supply Co., Harperville, O.
Sales Agency, The Company, Cleveland,O.

Piney Fork Nos. 1 and 2 Mines; Drifts; Pgh. No. 8 Seam; 55 to 64 in. thick.
PO—Piney Fork, O. SP—Same. CTY—Jefferson; RR—N. Y. Central, Alliance Div.
MS—Wm. Simpson.....Piney Fork, O.
SM—F. C. Leathers, “ “
ASST MS—Jos. Orell, “ “
S of H—4 Goodman elec. loco. and mules; track gauge 42 in.
S of M—16 Elec. mach and hand.
PP—6 Return tubular boilers, total 750 H. P., 3 gen. units, 250 volts, D. C., 11 pumps.
EMP—483. Last fiscal year output, 283,794 tons.

Harpersville, Nos. 3 and 4 Mines; Drift; Pgh. Seam No. 8; 58 to 66 in. thick.
PO—Piney Fork, O. SP—Harperville, O. (Prepay); CTY—Jefferson; RR—L. N. Y. Central, Alliance Div.
MS—Wm. Simpson.....Piney Fork, O.
SM—S. C. Longbon....Harperville, O.
S of H—2 Goodman elec. loco., and mules; track gauge 42 in.
S of M—9 Elec. mach. and hand.
PP—4 Return tubular boilers, 2 gen. units 250 volts D. C., 4 pumps.
EMP—288. Last fiscal year output, 40,735 tons.

JENKINS, D. C., & CO.
XX Mine; Drift; No. 6 Seam, 84 to 108 in. thick.
PO—Shawnee, O.; SP—Same; CTY—Perry; RR—B. & O.
GM—W. K. Redfern.......Shawnee, O.
MS—W. K. Redfern, “ “
EE—D. J. Lewis, “ “
S of H—1 Elec. loco.; track gauge 42 in.
S of M—1 Elec. mach.
EMP—9. Output 8,000 tons.

JOHNSON COAL CO.
Johnson Mine: Slope; Pittsburgh, No. 8 Seam; 5½ ft. to 6 ft. thick.
PO—Dilles Bottom, O.; SP—Johnson Sta. CTY—Belmont. RR—Penna, Powhattan Div.
PR—J. F. Johnson......Bellaire, O.
TR—Wm. Dickens, “ “
GM—J. F. Johnson, “ “
PA—J. F. Johnson, “ “
MS—Wm. Resmie....Dilles Bottom, O.
SM—W. W. Radabaugh, “ “
S of H—Mules and 3 elec. locos.; track gauge 42 in.
S of M—6 Elec. mach.
PP—3 Return tubular boilers, total H. P. 350, 1 gen. unit, 250 volts A. C., 2 pumps.
EMP—205. Last fiscal year output, 189,258 tons.
(Old information.)

JOHNSON & DAWSON.
New Minglewood No. 1 Mine; Slope; Massillon No. 1 Seam; 42 to 54 in. thick;
PO—North Lawrence, O :SB—Lawrence CTY—Stark;
PR—Arthur W. Dawson, North Lawrence, O.
TR—Arthur W. Dawson, North Lawrence, O.
MS—George Johnson,
S of H—Mules. Track gauge 36 in.
PP—1 Nagle-Rodgers Return Tubular boiler, total 55 H. P., 1 pump.
EMP—5. Last fiscal year output, 2170 tons.

JONATHAN CREEK COAL CO., (THE)
General Office, 5627 Margaretta St. Pittsburgh, Pa.
Jonathan Creek Mine, Drift, No. 6 Seam, 3 to 4 ft. thick.
PO—R.F.D. South Zanesville, O., SP—Buckeye, O., CTY—Muskingum RR—Z. & W., N. Y. C. Lines.
PR—Chas. F. Randolph.Pittsburgh, Pa.
TR—Chas. F. Randolph, “ “
GM—Chas. F. Randolph, “ “
PA—Chas. F. Randolph, “ “
S of H—Mules and elec. loco.
S of M—5 Elec. mach.
PP—1 Erie return tubular boiler, 150 H. P., 1 pump.

JONES COAL CO.
East Palestine, O. No report.

JOYCE COAL COMPANY.
Joyce Coal Co. Mine; Drift; No. 6 Seam; 58 in. thick.
PO—Carbon Hill, O; SP—Same; CTY—Hocking; RR—H. V., Monday Creek Branch.
PR—William Joyce,.....Carbon Hill, O.
SECY—Jack Coe, ” ”
PA—Jack Coe, ” ”
MGR—Jack Coe, ” ”
S of H—Mules. Track gauge 42 in.
S of M—1 Morgan & Gardner mach.
PP—250 volts D. C., purchase power.
Daily output, 100 tons.

KAUL CLAY CO.
Seam 45 in. thick.
PO—Toronto, O.; SP—Same; CTY—Jefferson; RR—C. & P.
PR—H. E. Kilgus........Toronto, O.
GM—H. E. Kilgus, “ “
PA—H. E. Kilgus, “ “
TR—I. T. Kaul, “ “
MS—Austin Ferguson, “ “
PP—6 Elec. water tube boilers.
EMP—350. Last fiscal year output, 25,000 tons.

KEHOTA MINING COMPANY.
General office, Zanesville, O.
Kehota Mine; Stripping; No. 5 & No. 6 Seams; 56 to 76 in. thick.
PO—Louisville, O. SP—Satillo, O. CTY—Perry; RR—Z. & W.
PR—W. W. Keefer,....Pittsburgh, Pa.
TR—S. A. Taylor, ” ”
CE—S. A. Taylor, ” ”
EM—S. A. Taylor ” ”
S of H—3 elec. & Steam locos. Track gauge 36 in.
S of M—Elec. Shovels.
PP—Purchase Power.
EMP—50.

KENNON COAL & MINING CO.
General Office, Cleveland, O.
Kennon Mine, Drift, No. 8 Pgh. Seam, 54 to 60 in. thick.
PO—Flushing, O.; SP—Same; CTY—Belmont; RR—B. & O.
PR—J. P. Burton......Cleveland, O.
TR—Courtney Burton .... “ “
PA—Courtney Burton .... “ “
MS—Alexander Lindsay....Flushing, O.
S of H—1 Elec. loco., track gauge 36 in.
S of M—6 Elec. mach.
PP—2 Return tubular boilers, 250 volts D. C., 2 pumps.
EMP—135.

KILBOLTON COAL CO.
See Kimbolton Coal Mining Co.

KIMBOLTON COAL MINING COMPANY.
Shaft Mine; No. 5 Seam; 44 to 52 in. thick.
PO—Cambridge, O; SP—Pigeon Gap Siding; CTY—Guernsey; RR—Penn'a., C. & M. Branch.
PR—C. L. Arthur,..... Cambridge, O.
TR—D. O. Van Kirk, ” ”
GM—W. G. Walters, ” ”
GS—Dave Steele, ” ”
MS—Dave Steele, ” ”
EM—Dill & Marsh ” ”
S of H—2 elec. and 1 storage battery loco. Track gauge 42 in.
S of M—3 elec. machs.
PP—2 Watertube boilers, 1 pump.
EMP—60. Daily output, 140 tons.
Note—Formerly konwn as the Kilbolton Coal Company, "Pigeon Gap" Mine.

KIRK-DUNN COAL CO., (THE)
Rhea Mine, Drift, No. 7, A Seam 4 to 5 1-4 ft. thick.
PO—Salem, O., SP—West Point, O., CTY—Columbiana; RR—Y. & O., and Erie.
PR—F. M. Kirk ....Cleveland, O.
TR—F. M. Kirk, “ “
PA—F. M. Kirk.........Cleveland, O.
GM—W. H. Dunn,.........Salem, O.
GS—W. H. Dunn, “ “
EM—John K. George..East Liverpool, O.
EE—August Swanson........Lisbon, O. R. F. D. No. 6.
S of H—3 Elec. loco., track gauge 36 in.
S of M—6 Elec. mach.
PP—Buy power. 1 pump.
EMP—290. Last fiscal year output 210,000 tons.

KRAMER BROS.
Drift Mine; No. 6 Seam, 84 to 132 in. thick.
PO—New Straitsville, O.; CTY—Perry; RR—H. V.
TR—F. E. Kramer..New Sraitsville, O.
GM—J. P. Kramer, “ “ “
PA—J. P. Kramer, “ “ “
EM—J. P. Kramer, “ “ “
MS—J. P. Kramer, “ “ “
S of H—Rope and mules.
S of M—Hand.
EMP—14.

LA BELLE IRON WORKS.
Mines in Ohio, Penna., and W. Va.
La Belle Mine; Shaft; Pgh. No. 6 Seam, 42 in. thick.
PO—Steubenville, O.; SP—Same; CTY—Jefferson; RR—C. & P.; W. & L. E.
PR—R. C. Kirk........Steubenville, O.
GM—G. B. Levan, “ “
PA—R. M. Rice, “ “
MS—R. W. McCasland, “ “
EM—J. C. Gibson, “ “
MM—A. J. Cox, “ “
EE—Jas. Farrington, “ “
S of H—Elec. loco.; track gauge 30 in.
S of M—3 Elec. Long Wall mach.
PP—34 Water tube boilers, total 16,100 H. P., 2 gen. units 275 volts D. C., 300 K. W., 3 pumps.
EMP—168. Last fiscal year output 137,440 tons.

LAMA, J. M.
No. 4 Mine, Drift, Hocking No. 6 Seam 72 in. thick.
PO—Nelsonville, O. SP—Same. CTY—Athens; RR—Hocking Valley.
TR—J. M. Lama,......Nelsonville, O.
GM—J. M. Lama, “ “
PA—Geo. A. Wraith, “ “
ME—Parker Sniffen, “ “
MS—Nate French, “ “
SM—Geo. A. Wraith, “ “
S of H—Mules.
S of M—Hand.
EMP—20. Last fiscal year output 20,000 tons.
Sales Agency, Hocking Domestic Coal Co., Nelsonville, O.

LAUREL HILL COAL CO.
Drift Mine; Hocking Seam No. 6, 48 to 72 in. thick.
PO—Nelsonville, O.; SP—Same; CTY—Athens; RR—H. V.
GS—James Meenan,......Nelsonville, O.
PA—James Meenan, “ “
TR—James Meenan, “ “
GM—James Meenan, “ “
MS—John McKee, “ “
S of H—Mules. Track gauge 42 in.
S of M—Hand.
EMP—20. Daily output 50 tons.
Formerly Cilfton Coal Co.

LAWLER, JOHN L. & SON.
General Office, Columbus, O.
Lawler No. 7 Mine; Slope; Jackson District Seam No. 4, 48 to 60 in. thick.
PO—Clarion, O.; SP—Same; CTY—Vinton; RR—Hocking Valley, River Div.
TR—John L. Lawler......Columbus. O.
GM—John C. Lawler, “ “
GS—John C. Lawler, “ “
PA—John C. Lawler, “ “
EM—E. R. Kelly...........Wellston, O.
EE—George Steele ....Clarion, O.
MS—George Steele, “ “
SCO—Lawler & Fitzpatrick. Buyer, J. A. Fitzpatrick, Alice, O.

S of H—Mules, and 1 Elec. loco.; track gauge 37½ in.
S of M—5 Elec. mach.
PP—2 Empire water tube boilers, total 280 H. P., 1 gen. unit 250 volts D. C.
EMP—90. Last fiscal year output 65,000 tons.

L. & H. COAL CO.
See Federal Eight Coal Mining Co.

LEVERS & SMITH COAL COMPANY
Out of business.

LOCUST GROVE COAL CO.
See Schmied and Dailey Coal Co.

LOMAX COAL CO.
Lomax Mine, Drift; Limestone Seam; 4 ft. thick..
PO—McArthur, O.; SP—Same; CTY—Vinton; RR—Hocking Valley.
PR—Hampson Lomax.....McArthur, O.
TR—F. L. Lomax, “ “
GM—Peter Lomax, “ “
MS—H. E. Lomax, “ “
S of H—Mules, track gauge 36 in.
S of M—Hand.
EMP—8. Last fiscal year output 3,682 tons.

LONG, THOMAS, COAL CO.
General Office, Shadyside, O.
Crystal Mine. Slope, Pgh. No. 8 Seam. 72 in. thick.
PO—Bellaire, O. SP—Same. CTY—Belmont. RR—B. & O. and Penna. and O. R. & W. R. R
PR—Thomas Long, ...Shadyside, O.
MS—Thomas Long, “
PA—Geo. M. Mertz, .. Bellaire, “
CE—D. A. Elkin, “ “
EE—Chas. Keck, ... Shadyside, “
S of H—Mules and Elec. loco.
S of M—Hand and 1 elec. machine.
PP—2 pumps. Purchase power.
EMP—12. Last fiscal year output 11,000 tons.

LORAIN COAL & DOCK COMPANY
General Office, Columbus, O..
PR—F. W. Braggins......Columbus, O.
VP—R. L. Wildermuth, “ “
2nd VP—A. C. Ingersoll, “ “
Chairman of Board—Edw Johnson, Columbus, O.
TR—Ray L. Phelps “ “
PA—O. D. Waters.......Bridgeport, O.
EM—Geo. W. Wyss.....Bridgeport, O.

Wheeling Creek Mine; Drift; No. 8 Pittsburgh Seam; 60 to 66 in. thick.
PO—Bridgeport, O.; SP—Same; CTY—Belmont; RR—B. & O., C. L. & W. Div.
S of H—Elec. locos.
S of M—Elec. Mach.

Crescent No. 2 Mine; Drift; No. 8 Pittsburgh Seam; 60 to 66 in. thick.
PO—Crescent, O.; SP—Same; CTY—Belmont; RR—B. & O., C. L. & W. Div.
S of H—Elec. locos.
S of M—Elec. mach.

Crescent No. 3 Mine; Drift; No. 8 Pittsburgh; 60 to 66 in. thick.
PO—Crescent, O.; SP—Same; CTY—Belmont; RR—B. & O., C. L. & W. Div.
S of H—Elec. locos.
S of M—Elec. mach..

Lansing Mine; Drift; No. 8 Pittsburgh Seam 60 to 66 in. thick.
PO—Lansing, O.; SP—Same; CTY—Belmont; RR—B. & O., C. L. & W. Div.
S of H—Elec. locos.
S of M—Elec. mach.

Blaine Mine; Drift; No. 8 Pittsburgh Seam, 60 to 66 in. thick.
PO—Blaine, O..; SP—Same; CTY—Belmont; RR—B. & O., C. L. & W. Div.
S of H—Elec. locos.
S of M—Elec. mach.

LOST RUN COAL CO.
Columbus, O. No. report.

LOVE BROTHERS.
No. 3 Mine; Drift; No. 6 Seam; 84 in. thick.
PO—Nelsonville, O; SP—New Pitsburgh; CTY—Athens, RR—H. V.
GS—John Love, Nelsonville, O.
S of H—Mules.
S of M—1 elec. mach.
PP—250 volts D. C., 1 pump, Purchase power.
EMP—18. Last fiscal year output, 15,000 tons.

LOWELL COAL MINING CO.
Youngstown, O. No report.

LUHRIG COAL WASHING & MINING CO.
General Office, Charleston, W. Va.
Luhrig Mine, Shaft, Seam 5½ to 10 ft. thick. Operate washery.
PO—Luhrig, O. SP—Same. CTY—Athens. RR—B. & O. S. W.
PR—F. W. Cool....Charleston, W. Va.
GM—F. W. Cool, " "
PA—F. W. Cool,...Charleston, W. Va.
TR—S. C. Boyer, ... Athens, O.
EM—J. B. Sands,........Athens, O.
MS—John Gibbs, ... Luhrig, "
EE—Marion Bell, " "
SM—Andrew Murphy, " "
S of H—5 elec. locos. Track gauge 42 in.
S of M—3 elec. mach.
PP—4 return tubular boilers, total 500 H. P., 4 gen. units 250 volts D. C., 2 pumps. Sales agent New River & Ohio Coal Co., Charleston, W. Va.
(Old information.)

McARTHUR BRICK CO.
Not operating coal mine.

McGARVEY, J. A.
Garrett No. 2 Mine, Drift, No. 6 Hocking Seam.
PO—Philo, O. SP—Same. CTY—Muskingum. RR—B. & O. and O. & L. K.
PR—J. A. McGarvey ....Philo, O.
MS—J. A. McGarvey, " "
S of H—Mules and rope.
S of M—1 elec. machine.
PP—1 return tubular boiler, gen. unit 250 volts A. C.
EMP—15. Last fiscal year output 6,000 tons.

MAGNOLIA COAL CO.
Magnolia, O. No report.

MANHATTAN COAL COMPANY.
General Office, Columbus, Ohio.
PR—H. H. Long, ... Columbus, O.
TR—E. H. Davis, " "
PA—P. C. Morris......Nelsonville, O.
GS—P. C. Morris, .. Nelsonville, "
EM—J. L. Murphy, " "
MM—P. B. Verity, " "
EE—P. B. Verity, " "
Sales agents, New York Coal Co., Columbus, Ohio.

No. 25 Mine; Shaft; No. 6 Seam; 48 to 72 in. thick.
PO—Chauncey, O.; SP—Same; CTY—Athens; RR—K. & M.
MS—William Collins.....Chauncey, O.
S of H—1 elec. loco. and mules.
S of M—3 elec. mach.
PP—1 pump. Purchase power.
EMP—100.

Mine No. 30; Drift; No. 6 Seam, 48 to 96 in. thick. Operate Washery.
PO—Orbiston, O. SP—Same. CTY—Hocking. RR—Hocking Valley.
MS—P. W. Wickham, Nelsonville, O.
S of H—2 elec. loco. Track gauge 42 inches.
S of M—6 elec. machines.
PP—1 200 K. V. A. M. G. set. Power purchased.
EMP—290.

Mine No. 31, Drift, Middle Kittanning Seam 48 to 96 in. thick. Operate Washery.
PO—Buchtel, O. SP—Same. CTY—Athens. RR—Hocking Valley.
MS—Geo. McMahon........Murray, O.
S of H—2 elec. locos. Track gauge 42 inches.
S of M—5 elec. machines.
PP—1 250 K. V. A., 1 100 K. V. A. M. G. Set. Power purchased.
EMP—275.

Mine No. 36, Drift, Upper Freeport seam, 4 to 5 ft. thick. Operate washery.
PO—Buchtel, O. SP—Same. CTY—Athens. RR—Hocking Valley.
MS—M. Brandenburg....Nelsonville, O.
S of H—8 elec. gathering locos. Track gauge 42 in.
S of M—6 elec. machines.
PP—3 pumps; 1 250 K. V. A., 1 100 K. V. A. M. G. set. Power purchased.
EMP—200.

Mine No. 37, Drift, Middle Kittanning Seam, 5 to 7 ft. thick. Operate washery.
PO—Nelsonville, O. SP—Buchtel, O. CTY—Athens. RR—Hocking Valley.
MS—John Murphy, ... Nelsonville, O.
S of H—1 elec. loco. Track gauge 42 inches.
S of M—2 elec. machines.
PP—175 K. V. A. M. G. set, 3 pumps. Power purchased.
EMP—150.

Stewart Washery.
PO—Buchtel, O.; SP—Same; CTY—Athens; RR—H. V.
MS—John Williams........Buchtel, O.
PP—2 return tubular boilers, total 300 H. P.
EMP—16. Last fiscal year output 200,000 tons.

MARKLEY, GEORGE J.
Acme Mine; Drift; No. 5 Seam; 36 to 54 in. thick.
PO—Mineral City, O.; SP—Same; CTY—Tuscarawas; RR—B. & O., C. T. & V. Branch.
PR—Geo. J. Markley...Mineral City, O.
TR—Geo. J. Markley, " "
GS—Geo. J. Markley " "
PA—Geo. J. Markley " "
MS—Louis Zimmer, " "
SM—T. A. Markley " "
SCO—Markley Big Store Co.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
EMP—15. Last fiscal year output, 1500 tons.

MASSILLON-BELMONT COAL CO., THE
One mine in Ohio.
Shaft Mine; 8-A Seam.
PO—Flushing; SP—Same; CTY—Belmont; RR—B. & O.
PR—David Reed. ...... Massillon, O.
TR—J. C. Haring, " "
PA—H. A. Haring.......Massillon, O.

MASSILLON CITY COAL CO, THE
Massillon City No. 6, Massillon or No. 1 Seam; 36 to 66 in. thick. Operate washery.
PO—Massillon, O.; SP—Same; CTY—Stark; RR—W. & L. E.
PR—J. F. Pocock......Massillon, O.
TR—J. C. Haring, " "
MS—Wm. J. Penman, " "
S of H—Mules.
S of M—Hand.
PP—2 return tubular boilers, 1 air compressor, 2 pumps.
EMP—75. Last fiscal year output 34,000 tons.

MASSILLON COAL MNG. CO, THE
General Office, Cleveland, O.
Nos. 24, 25, 26 and 27 Mines; Shafts, No. 1 or Massillon Seam, 4 ft. thick. Operate washery.
PO—Massillon, O.; SP—Dalton and Orville. CTY—Stark & Wayne. RR—Penna. Co., W. & L. E., P. R. R. O.
PR—D. R. Hanna, ... Cleveland, O
TR—C. H. Hanna, " "
GM—Michael Gallagher, "
PA—F. F. Cadden.......Cleveland, O.
GS—John Whelan, Jr.....Massillon, O.
MS—Wm. Whelan, " "
EM—H. Howard, " "
S of H—Mules and 2 elec. locos. Track gauge 3 ft. 3 in.
S of M—16 elec. mach.
PP—13 return tubular boilers, total 1900 H. P., 4 gen. units, 250 volts D. C., 1 air comp., 12 pumps.
EMP—400. Last fiscal year output 115,984 tons. Sales agent, M. A. Hanna & Co., Cleveland, O.

MASSILLON OAK HILL COAL CO.
Oak Hill Mine, Shaft, No. 1 Ohio Seam, 48 to 60 in. thick.
PO—Massillon, O.; SP—Brewster, O.; CTY—Stark; RR—W. & L. E., Toledo Div.
PR—John C. Albright, .. Massillon, O.
TR—John C. Albright, " "
GM—C. H. Albright, " "
SM—C. H. Albright " "
MS—Geo. Bullach, " "
CE—D. C. Borton.........Alliance, O.
S of H—Mules. Track gauge, 39 in.
S of M—3 elec. mach.
PP—2 water tube boilers, 1 return tubular boiler, total 200 H. P., 1 gen. unit, 250 volts D. C., 3 pumps.
EMP—100. Last fiscal year output 30,000 tons. Sales agency, Albright Coal Co., Cleveland, O.

MASSILLON-TUSCARAWAS COAL CO., THE
General Office, Massillon, O.
Central Valley Nos. 1 and 3 Mines. Drifts, 3 ft. 8 in. to 4 ft. 4 in. thick.
PO—New Cumberland, O. SP—Same. CTY—Tuscarawas. RR—W. & L. E.
PR—J. C. Corns, ... Massillon, O.
TR—H. T. Beatty, " "
GM—R. W. Johns, " "
PA—R. W. Johns, " "
MS—L. Roberts ....Somerdale, O.
S of H—Tail rope Track gauge 39 in.
S of M—14 comp. air mining mach.
PP—1 air comp., 2 pumps, boilers total 300 H. P.
EMP—125. Last fiscal year output 100,000 tons. Sales agent, R. W. Johns.

MATHIAS, JOHN.
Pleasant Hill Mine; Drift; No. 6 Seam; 44 in. thick.
PO—New Philadelphia, O.; SP—Same; CTY—Tuscarawas; RR—B. & O., C. & P.
GM—John A. Mathias, New Philadelphia, O.
PA—John A. Mathias, New Phila., O.
MS—John A. Mathias, " "
S of H—Mules. Track gauge 30 in.
S of M—Hand.
EMP—8. Last fiscal year output 7,100 tons.

MAYNARD COAL CO.
General Office, Columbus, O.
GM—H. H. Heiner......Columbus, O.
PA—H. H. Heiner, " "
EM—George L. Sherman....Pomeroy, O.

Nos. 1, 2 and 3 Mines; Drift.
PO—Rutland, O.; SP—Same; CTY—Meigs; RR—K. & M.
MS—(1) L. J. Heiner, Rutland, O.; (2) Ed Kennedy, Rutland O.; (3) G. A. Preest, Middleport, O.
S of H—Mules.
S of M—Hand.
PP—4 Boilers, total 600 H. P., 1 gen. unit, 250 volts D. C.

Wainwright Mine; Shaft; No. 2 Seam, 22 to 44 in. thick.
PO—Wellston, O.; SP—Same; CTY—Jackson; RR—C. H. & D.
MS—Theo. Waters..........Wellston, O.
S of H—1 Elec. loco and mules; track gauge, 37 1-2 in.
S of M—Elec. mach. and hand.
PP—2 Return tubular boilers, total 220 H. P., 1 gen. unit, 250 volts D. C., 4 pumps.

MEEKER RUN COAL CO. (THE)
Meeker Run Nos. 204 and 205 Mines; Drifts; Middle Kittanning or No. 6 Seam; 66 to 72 in. thick.
PO—Nelsonville, O.; SP—Same; CTY—Athens; RR—H. V.
PR—C. H. Terry, ...Nelsonville, O.
PA—C. H. Terry, " "
EM—C. H. Terry, " "
TR—C. H. Terry, " "
MS—C. H. Terry, " "
S of H—Mules and 1 elec. loco; Track gauge 42 in.
S of M—2 elec. mach.
PP—2 Nagle return tubular boilers, total 300 H. P., 1 gen. unit, 250 volts D. C., 3 pumps. Power purchased.
EMP—44. Output 35,000 tons.

MEISTER COAL CO., THE
Meister Mine; Drift; No. 8 Seam; 54 to 66 ins. thick.
PO—Flushing, O. SP—Same. CTY—Belmont. RR—B. & O.
PR—Joseph Meister, ... Flushing, O.
TR—Jacob Meister, " "
GS—Joseph Meister, " "
MS—Chiles Evans.......Flushing, O...
EM—D. A. Elkin, ... Bellaire, "
S of H—Mules and 2 elec. locos. Track gauge 36 in.
S of M—6 elec machines.
PP—2 Union Iron Works return tubular boilers, total 300 H. P., 1 gen. unit, 250 volts D.C., 1 pump.
EMP—125. Last fiscal year output 30,000 tons. Sales Agents, H. S. Odbert Coal Co., Cleveland, O.

MIDLAND COAL COMPANY.
Midland Mine; Drift; Cambridge No. 7 Seam: 60 to 64 in. thick.
PO—Byesville, O; SP—Same; CTY—Guernsey; RR—Penna. Electric Line Branch.
GM—Geo. McLaughlin.....Byesville, O.
S of H—Mules.
S of M—One Electric Mach.
PP—Purchase power.
EMP—8. Last fiscal year output 8,000 tons.

MIDVALE COAL CO.
Midvale No. 4 Mine; Drift; No. 6 Seam; 48 to 60 in. thick.
PO—Midvale, O. SP—Same. CTY—Tuscarawas. RR—B. & O.
PR—H. E. Cole, ... Midvale, O.
TR—R. W. Rutledge........Midvale, O.
GM—R. W. Rutledge, " "
GS—R. W. Rutledge, " "
MS—C. B. Fox, " "
S of H—Mules and rope. Track gauge 38 in.
S of M—5 elec. mach.
S of M—5 elec. mach.
PP—1 Erie & Brownell boiler, 1 Motor gen. set, 350 volts D. C., 2 pumps, purchase power.
EMP—150. Last fiscal year output 92,000 tons.

Royal Goshen No. 3 Mine; Drift; No. 6 Seam; 48 to 60 in. thick.
PO—Midvale; SP—Same; CTY—Tuscarawas; RR—B. & O.
MS—Wm. Smith..........Midvale, O.
S of H—Mules and rope. Track gauge 38 in.
S of M—Hand.
PP—1 pump. Purchase power.
EMP—20. Last fiscal year output 18,000 tons.

MIDVALE-GOSHEN COAL CO. THE
General Office, 612 Electric Bldg., Cleveland, O.
Wainwright Mines, Slope and Drift, No. 6 Seam, 4 to 4½ ft. thick.
PO—Wainwright, O. SP—Uhrichsville, O. CTY—Tuscarawas. RR—B. & O.
PR—J. G. Masterton, .. Cleveland, O.
TR—H. M. Carpenter, " "
GM—J. G. Masterton, " "
PA—J. G. Masterton, " "
GS—J. C. Kyte, .. Wainwright, "
S of H—Mules, rope and 2 elec. loco. Track gauge 36 in.
S of M—Pick and 12 elec. machines.
PP—4 water tube boilers, Erie make, total 500 H. P., 2 gen. units, 250 volts D. C., 3 pumps.

MILLER & PYLE.
Miller & Pyle Mine; No. 6 Seam; 36 to 120 in. thick.
PO—Somerdale, O; CTY—Tuscarawas; RR—W. & L. E.
PR—L. G. Pyle, ...Somerdale, O.
GM—L. G. Pyle, " "
TR—William Miller, " "
MS—John Miller, " "
S of H—Mules.

MILTON COAL & LIME CO., THE
General Office, Canton, O.
Milton Mine; Drift; No. 4 or 5 Seam, 48 to 60 in. thick.
PO—North Industry, O.; SP—Howenstine, O.; CTY—Stark; RR—B. & O.
PR—M. Shaeffer..........Canton, O.
TR—M. Shaeffer, " "
GM—M. Shaeffer, " "
PA—M. Shaeffer, " "
S of H—Mules.
S o. M—Hand.
PP—1 pump.
EMP—40. Last fiscal year output 16,000 tons.

MILTON MINING CO.
No. 1 Mine; Shaft; No. 2 Seam; 36 in. thick.
PO—Wellston, O.; SP—Same; CTY—Jackson; RR—B. & O.
MS—Herbert Poore, ... Wellston, O.
PP—1 water tube boiler, 1 pump.
Note—Idle at present.

MINERS BLOCK COAL CO. (THE)
General Office, 2406 First National Bank Bldg., Pittsburgh, Pa.
Kelley Mine; Drift; No. 8 Pgh. Seam, 60 to 66 in. thick.
PO—Rayland, O.; SP—Same; CTY—Jefferson; RR—P. R. R., C. & P. River Div.
PR—Harry Brown,.........Rayland, O.
GM—Harry Brown, " "
MS—Harry Brown, " "
EE—B. Brunner, " "
PA—E. Stewart........Pittsburgh, Pa.
TR—D. C. Eaton, " "
EM—M. D. Gibson,.....Dunsmore, Pa.
S of H—Mules, rope and 1 elec. loco. Track gauge 36 in.
S of M—4 elec. mach.
PP—1 Erie return tubular boiler, 150 H. P., 1 gen. unit, 250 volts D. C., 1 pump.
EMP—40. Last fiscal year output 20,000 tons.

MINGLEWOOD COAL CO.
Minglewood Mine; Slope; Nos. 2, 4 and 5 Seams, 42 in. thick.
PO—Wellston, O. SP—Same. CTY—Jackson: RR—D. T. I. & C. H. D.
PR—J. E. Baumgartner..Wellston, O.
GM—J. E. Baumgartner.. " "
PA—J. E. Baumgartner.. " "
TR—W. R. Baumgartner, " "
S of H—Rope and gravity. Track gauge 36 in.
S of M—Hand.
PP—2 water tube boilers.
EMP—56. Last fiscal year output 25,000 tons.
Formerly Detroit & Wellston Coal Co.

MODERN COAL MINING CO.
General Office, Columbus, O.
Stripping Mine; No. 8 Seam, 56 to 72 in. thick.
PO—Parlett, O.; SP—Same; CTY—Jefferson; RR—W. P. T.
PR—A. Brenholts........Columbus, O.
TR—Roy Brenholts, " "
PA—Roy Brenholts, " "
GM—W. P. Bates, ...Parlett, O.
MS—W. P. Bates, " "
S of M—Steam shovels.
EMP—30. Last fiscal year output 18,000 tons.

MOHAWK COAL CO.
General Office, Chillicothe, O.
Drift Mine, No. 5 Seam, 48 to 62 in: thick.
PO—Wellston, O.; SP—Same; CTY—Jackson; RR—C. H. & D., Buckeye Branch.
PR—J. M. Rittenour, Chillicothe, O.
TR—Valentine Rice, " "
GM—J. A. Lockard, ...Wellston, O.
PA—J. A. Lockard, " "
GS—J. A. Lockard, " "
MS—Eli Gintry, " "
EM—Ed. Kelley, " "
SCO—The Mohawk, " "
S of H—Mules; track gauge 36 in.
S of M—Hand.

MONSARRAT BROTHERS.
General Office, 211 Hartman Bldg., Columbus, O.
Slope Mine; Hocking Seam.
PO—Hemlock, O.; SP—Same; CTY—Perry; RR—Zanesville & Western.
S of H—Mules.
S of M—2 Elec. machines.
PP—Gas engines.
EMP—75.

MORGAN, A. J., COAL CO.
General Office, Bellaire, Ohio.
PR—A. J. Morgan........Bellaire, O.
GM—A. J. Morgan, " "
TR—A. J. Morgan, " "
PA Herbert N. McVay.....Bellaire, O.
GS—Jacob L. Long, ...Bannoc, O.
EM—D. A. Elkins.........Bellaire. O.

Franklin Mine; Drift; Pittsburgh No. 8 Seam, 60 in. thick.
PO—Stewartsville, O.; SP—Same; CTY—Belmont; RR—B. & O., Newark Div.
MS—Samuel Kinsey....Stewartsville, O.
S of H—Mules and 3 elec. locos. Track gauge 34 in.
S of M—6 elec. mach.
PP—Purchase power.
EMP—100.

MORGAN RUN COAL & MINING CO. THE
PR—Robert B. Dennis, Coshocton, O.
GM—Robert B. Dennis, " "
GS—Robert B. Dennis, " "
PA—Robert B. Dennis, " "

Morgan Run No. 3, Drift, No. 6 Seam, 3 ft. to 5 ft. thick.
PO—Coshocton, O. SP—Same. CTY—Coshocton. RR—W.&L.E.,&P.RR.
MS—John Ingham.......Coshocton, O.
S of H—2 elec. loco. Track gauge 36 in.
S of M—2 elec. mach.
PP—1 pump, motor generator set, 250 volts D. C., 60 cycle, 3 phase. Power purchased.
EMP—40.

MORRIS COAL CO.
General Office, ... Cleveland, O.
PR—Wm. Harper, " "
TR—Wm. Harper, " "
GS—Jas. Prendergast.....Cambridge, O.
PA—G. W. Neyman, " "
EM—J. C. Simpson, " "
EE—Chas. Touvells.......Lore City, O.
Andy Hinton, .. Senecaville, "

Cleveland Mine, Shaft, No. 7 Seam, 5 to 6 ft. thick.
PO—Senecaville, O. SP—Same. CTY—Guernsey. RR—B. & O., Eastern Ohio Branch.
MS—Thos. Vail, ... Senecaville, O.
S of H—Mules and 8 elec locos. Track gauge 42 in.
S of M—10 elec. machines.
PP—5 water tube boilers, 2 gen. units 250 volts D. C., 6 pumps.
EMP—250. Last fiscal year output 133,392 tons.

Black Top Mine, Shaft, No. 7 Seam, 4½ to 5½ ft. thick.
PO—Lore City, O. SP—Same. CTY—Guernsey. RR—B. & O.
MS—S. B. Phillips ......Lore City, O.
SCO—The Black Top Supply Co., Lore City, O.
SM—John H. Davis, .. Cambridge, O.
S of H—Mules and 8 elec. locos. Track gauge 42 in.
S of M—10 elec. machines.
PP—5 water tube boilers, 2 gen. units, 250 volts D. C., 3 pumps.
EMP—300. Last fiscal year output 190,809 tons.

MORRIS-POSTON COAL CO.
General Office, Cleveland, O.
Dun Glen Mine, Drift, No. 8 Seam.
PO—Dun Glen, O. SP—Same. (Prepay) CTY—Jefferson. RR—W. & L. E
GM—T. R. Biddle, ... Dun Glen, O.
PA—T. R. Biddle, " "
EM—B. B. Ireland, " "
MS—C. H. Thompson....Dun Glen, O.
SM—R. L. Tomlinson, " "
S of H—9 elec. locos.
S of M—15 elec. machines.
PP—Gen units, 250 volts D. C., 6 boilers, total 900 H. P.
EMP—400.

MULLINS, JAMES, COAL CO. (THE)
General Office, Martin Bldg., Canton, O.
Goshen Mine; Drift; No. 6 Seam, 48 to 54 in. thick.
PO—New Philadelphia, O.; SP—Same; CTY—Tuscarawas; RR—P. R. R., Beaver Dam Branch.
PR—James Mullins. ......Wooster, O.
TR—C. A. McDonald......Canton, O.
GM—D. P. Loomis, " "
GS—D. P. Loomis, " "
PA—D. P. Loomis, " "
EM—George E. Arnold, " "
S of H—6 Elec. Loco.
S of M—9 Elec., 8 comp. air mach.
PP—3 Return tubular boilers, total 450 H.P., 2 gen. units 250 volts D. C., 1 compressor.
EMP—150. Last fiscal year output 180,000 tons.
Sales Agent, C. A. McDonald.

MURRAY CITY MINING CO.
Slope Mine, Seam 6½ to 7 ft. thick.
PO—Murray City, O. SP—Same. CTY—Hocking. RR—Hocking Valley.
PR—J. W. Wishert.....Murray City, O.
TR—A. R. Jones, " "
GM—J. W. Wishert, " "
PA—J. W. Wishert, " "
MS—J. W. Wishert, " "
EE—Peter Carroll, " "
S of H—Horses. Track gauge 42 in.
S of M—2 Elec. machines.
EMP—30. Last fiscal year output 25,000 tons. Sales agency, W. H. Warner Coal Co., Cleveland, O.

MYERS, THEO.
General office, New Berlin, O.
Wise Mine; Shaft; No. 5 Vein; 66 to 75 in. thick.
PO—Aultman, O; SP—Same; CTY—Stark; RR—B. & O.
OWNER—Theo. Myers, New Berlin, O.
S of H—1 steam and 1 gasoline loco.
S of M—Hand.
PP—1 Water tube boiler.
EMP—8. Last fiscal year output, 3000 tons.

NATIONAL COAL CO.
General Office, Cleveland, O.
PR—Chas. Baird, Center Conway, N. H.
TR—W. J. McFarlin..Cleveland, O.
PA—W. J. McFarlin, " "
GM—H. E. Loomis, " "
GS—C. E. Haskins......Cambridge, O.
EM—Ed. Clark, " "
MM—Ed. Clark, " "
EE—Ed. Clark, " "

Little Katie No. 1 Mine; Shaft; No. 7 Seam, 48 to 8 4in. thick.
PO—Byesville, O.; SP—Same; CTY—Guernsey, O.; RR—P. R. R.
MS—Thos. Bradbury.......Byesville, O.
S of H—4 Elec. loco. and mules track gauge 42 in.
S of M—9 Elec. mach.
PP—4 Water tube boilers, total 600 H. P., 2 gen. units D. C., 3 pumps.
EMP—225. Last fiscal year output 250,000 tons.

Little Katie No. 2 Mine; Slope; No. 7 Seam, 66 to 72 in. thick.
PO—Pleasant City, O.; SP—Blue Bell, O.; CTY—Guernsey; RR—B. & O.
MS—Chas. Llewellyn, Pleasant City, O.
S of H—11 Elec. loco.; track gauge 42 in.
S of M—9 Elec. mach.
PP—1 pump. Power from Minnehaha.
EMP—350. Last fiscal year output 400,000 tons.

Harryette Mine; Shaft; No. 7 Seam, 72 to 84 in. thick.
PO—Byesville, O.; SP—Same; CTY—Guernsey, RR—P. R. R.
MS—Ottis Mass..........Byesville, O.
S of H—4 Elec. loco. and mules; track gauge 42 in.
S of M—6 Elec. mach.
PP—1 pump. Power from Minenhaha.
Last fiscal year output 200,000 tons.

Minehaha Mine; Slope; No. 7 Seam, 72 to 84 in. thick.
PO—Byesville, O.; SP—Same; CTY—Guernsey; RR—P. R. R.
MS—Wm. Dyer..........Claysville, O.
S of H—13 Elec. loco.; track gauge 42 in.
S of M—11 Elec. mach.
PP—10 Water tube boilers, total 1500 H. P., 7 gen. units D. C., 1 pump.
EMP—400. Last fiscal year output 500,000 tons.

NAVARRE STREET COAL CO.
PO—Navarre Road S. W., Canton, O.
GM—James G. Graham, " "
PR—R. B. Robinson........Canton, O.
TR—C. L. Gay, " "
PA—C. L. Gay, " "
EMP—12.
Operating a retail coal business.

NEGLEY COAL CO. (THE)
Pleasant Valley Mine, Drift, No. 6 Seam; 32 to 38 in. thick.
PO—Negley, O. SP—Same. CTY—Columbiana. RR—P. L. & W.
TR—. J. Moore.............Negley, O.
GM—P. H. Murphy, " "
MS—Harvey Burson, " "
S of H—Mules.
S of M—Hand.
EMP—36. Last fiscal year output 14,726 tons.

NEIHEISEL COAL CO.
Leetonia, O. No report.

NELSONVILLE COAL CO.
Nelsonville, O. No report.

NEW PHILADELPHIA COAL & MINING CO.
See Cleveland Canton Coal Co.

NEW PITTSBURGH COAL COMPANY. THE
General Office, Columbus, O.
PR—G. C. Weitzell, .. Columbus, O.
TR—H. S. Mervin, " "
PA—H. S. Mervin, " "
GS—F. S. Knox, Jr., Nelsonville, "
EM—F. S. Knox, Jr., " "
EE—Wm. Guseman..........Athens, O.
SCO—The New Pgh. Coal Co. Buyer, J. W. Roberson, Nelsonville, O. Sales agent, J. A. Rundio, Columbus, O.

Greendale Mine No. 5, Drift, No. 6 Seam.
PO—Murray City, O. SP—Same. CTY Hocking. RR—Hocking Valley.
MS—John Slater, .. Murray City, O.
SM—A. J. Curl, " "
S of H—Animal, rope and elec. loco. Track gauge 42 in.
S of M—elec machines.
EMP—350. Annual output 271,208 tons.

Murray City No. 7, Drift, No. 6 Seam.
PO—Murray City, O. SP—Same. CTY—Hocking. RR—Hocking Valley.
MS—John Slater.......Murray City, O.
SM—A. J. Curl, " "
S of H—Animal, rope and elec. loco. Track gauge 42 in.
S of M—Elec. machines.
EMP—400. Annual output 253,16[illegible] tons.

Kittanning No. 9, Shaft, No. 6 Seam.
PO—Nelsonville, O., R.F.D. No. 1. SP—Beaumont, O. CTY—Athens. RR—Hocking Valley.
MS—Dan Shay,
Nelsonville, O., R.F.D.No. 1.
SM—D. F. Woodruff,
Nelsonville, O., R. F. D. No. 1.
S of H—Animal and elec. loco. Track gauge 42 in.
EMP—400. Annual output, 242,607 tons.

New Monarch No. 10, Shaft, No. 6 Seam.
PO—Athens, O., R. F. D. No. 6; SP—Hocking, O.; CTY—Athens; RR—H. V.
MS—Jos. Slater, ... Athens, O.
SM—Phillip Miller.
S of H—Animal and elec. loco. Track gauge 42 in.
EMP—300. Annual output 232,114 tons.

NEW YORK COAL CO.
General Office, Columbus, Ohio.
No. 201 Mine; Shaft; No. 6 Seam, 5½ ft. thick.
PO—Floodwood, O.; SP—Same; CTY—Athens; RR—H. V.
Dist Supt—Harry Kelley, Nelsonville O.
S of H—Elec. loco.
S of M—Elec. mach. and hand.
PP—3 boilers, total 450 H. P., gen. unit 250 volts D. C.
EMP—80.

No. 275 Mine; Shaft; No. 6 Seam, 5½ ft. thick.
PO—Chauncey, O.; SP—Same; CTY—Athens; RR—K. & M.
Dist Supt—Field Scott.....Athens, O.
MS—Wm. Collins........Chauncey, O.
S of H—Elec. loco.
S of M—Elec.
PP—3 boilers, total 395 H. P.; gen. units 250 volts D. C.
EMP—204.

NEWPORT COAL COMPANY
General Office, 201 Boulevard, New Phila., Ohio.
Newport Coal Co. Mine; Drift; No. 6 Seam; 48 to 50 in. thick.
PO—Tracy, O.; SP—Newport, O.; CTY—Tuscarawas; RR—B. & O., C. L. & N. branch.
GM—W. W. Wilkinson,
New Philadelphia, O.
TR—W. W. Wilkinson, " "
S of H—Mules.
S of M—Hand and elec. mach.
EMP—10.

NEWTON COAL & MINING CO
Newton Mine, Slope, No. 7 or Upper Freeport Seam, 4 to 4½ ft. thick.
PO—Dennison, O. SP — Philadelphia Roads, O. RR—P.C.C. & St. L.
PR—C. G. Newton.........Dennison, O.
TR—H. D. Woodbridge, .. Newark, "
GM—C. G. Newton........Dennison, O.
PA—Chauncey Newton, " "
EM—Chauncey Newton, " "
EE—F. O. Culley, " "
MS—F. O. Culley, " "
SCO—The Newton Coal & Mining Co.
S of H—Head and tail rope. Track gauge 36 in.
S of M—5 elec. chain breast machs.
PP—2 pumps, 2 return tubular boilers, 300 H. P., 1 gen. unit, 250 volts D. C.
EMP—95. Annual output 75,000 tons.

NICHOLSON CLAY PRODUCTS CO.
General Office, Cambridge, O.
Drift Mine; No. 7 Seam, 48 to 66 in. thick.
PO—Byesville, O.; SP—Same; CTY—Guernsey; RR—P. R. R., Marietta Div.
PR—A. W. Nicholson....Cambridge, O.
TR—A. W. Nicholson. " "
MS—John Bennett........Byesville, O.
S of H—Mules.
S of M—Hand.
PP—2 Return tubular boilers, total 250 H. P., 1 gen. unit, 250 volts D. C., 2 pumps.
EMP—50. Last fiscal year output, 10,000 tons.

NICHOLSON, P. R.
Nicholson Mine; Drift; No. 8 Seam; 60 in. thick.
PO—Dillonvale, O. CTY—Jefferson. RR—L. E. A. & W.
GM—P. R. Nicholson, Dillonvale, O.
GS—P. R. Nicholson, " "
PR—P. R. Nicholson, " "
PA—P. R. Nicholson, " "
CE—J. B. Headley......Piney Fork, O.
EM J. B. Headley, " "
S of H Mules. Track gauge 36 in.
S of M—Hand.
EMP—8. Last fiscal year output 7,000 tons.

NIXON, L. H. COAL CO.
Nelsonville, O. No report.

NORTH HOCKING COAL CO.
PO—Murray, O.; CTY—Hocking.
No report.

NORTH LIMA COAL CO.
North Lima Mine, Shaft, No. 3 Seam, 24 to 30 in. thick.
PO—Washingtonville, O.; SP—North Lima, O.; CTY—Columbiana; RR—Youngstown & Southern.
PR—George Day ......North Lima, O.
TR—Paul Coachway, " "
GM—Thos. Macallum.Washingtonv'le, O.
PA—Thos. Macallum, " "
MS—Thos. Macallum, " "
S of H—Mules. Track gauge 2 ft.
S of M—1 electric machine.
PP—1 generating unit, 250 volts D. C., 1 pump, purchase power.
EMP—24. Last fiscal year output 4,575 tons.

NORTHERN MINING & FUEL CO.
General Office, Nelsonville, O.
No. 24 Mine; Slope; No. 7 Up. Freeport Seam, 50 to 60 in. thick.
PO—Jacksonville, O.; SP—Same; CTY—Athens; RR—K. & M., Green's Run Branch.
PR—C. E. Burdette....Jacksonville, O.
MS—C. E. Burdette, " "
MM—F. Wemmer, " "
TR—C. C. Sharp........Nelsonville, O
GM—C. C. Sharp, " "
PA—C. C. Sharp, " "
CE—C. C. Sharp, " "
EM—Parker Sniffen, " "
SCO—Sanders & Hope Co.,
Jacksonville, O.
S of H—Mules and 1 Elec. loco.; track gauge, 42 in.
S of M—4 Elec. mach.
PP—2 Return tubular boilers, total [illegible]00 H. P., gen. unit, 150 K. W. M. G. Set, 440 volts A. C., 3 phase, 60 cycles, 250 volts D. C. and 1 pump.
EMP—180. Last fiscal year output 80,602 tons.
Sales Agency, W. A. Gosline & Co., Toledo, O.

NOVELTY BRICK & COAL CO.
Novelty Mine; Slope, No. 6 Seam, 30 in. thick.
PO—Newcomerstown, O.; SP—Same; CTY Tuscarawas; RR—C. & M.
PR—Henry Hess, ...Newcomerstown, O.
TR—T. S. Brooks, " "
MS—Chas. Smith, " "
S of H—Mules and rope; track gauge 24 in.
S of M—2 Comp. air mach.
PP—Power from Brick Plant, 2 pumps.
EMP—10. Last fiscal year output 6,500 tons.
Coal used in Brick Plant.

NUMBER THREE COAL CO.
Nos. 117 and 13 Mines; Slope and Drift; No. 6 Seam; 96 in. thick.
PO—Shawnee, O.; SP—Same; CTY—Perry; RR—B. & O.
PR—John T. Turnbull,....Shawnee, O.
GM—John T. Turnbull " "
MS—John T. Turnbull " "
TR—B. G. Trew " "
CE—Wm. Berry " "
S of H—Horses (at present). Track gauge 42 in.
S of M—2 elec. machines.
PP—4 pumps.
EMP—26. Output daily, 100 tons.

OAK HILL FIRE BRICK & COAL CO. (THE)
Oak Hill Mine; Drift; No. 4 Seam, 36 in. thick.
PO—Oak Hill, O. SP—Same. CTY—Jackson. RR—B. & O. S. W.
PR—John J. Thomas.....Oak Hill, O.
TR—T. J. Davies . " "
GM—T. J. Davies ..... " "
GS—T. J. Davies........Oak Hill O.
PA—T. J. Davies ..... " "
MS—James A. Whitt, " "
S of H—Mules. Track gauge 3 ft.
S of M—Hand.
PP—1 Return tubular boiler, 12 H. P.
EMP—7. Last fiscal year output 5,122 tons.
Mine for own use.

OHIO CANNEL COAL CO. (THE)
Wegley Mine; Drift; Upper Kittanning Seam; 66 to 78 in. thick.
PO—Coshocton, O., R.F.D. No. 7; SP—Wegley, O.; CTY—Coshocton; RR—P. R. R., C. & A. C. branch.
PR—Boyd H. Dodson......Coshocton, O.
PA—Boyd H. Dodson, " "
GS—Boyd H. Dodson, " "
EM—J. A. Hanlon, " "
CE—J. A. Hanlon, " "
TR—E. S. Wallace, " "
SCO—Ohio Cannel Coal Co. Store .Buyer, M. E. R. Wersderfer, Coshocton, O.
S of H—Mules.
S of M—Hand; Later will equip with elec. mach.
EMP—6 to 8. Last fiscal year output 650 tons.
Note—Idle most of the year.

OHIO FIRE BRICK CO.
No. 5 Seam, 48 to 36 in. thick.
PO—Oak Hill, O. SP—Same. CTY—Jackson. RR—B. & O.
PR—D. D. Davis ......Oak Hill, O.
TR—D. D. Davis ...... " "
GM—E. P. Davis ...... " "
CE—E. P. Davis ...... " "
GS—A. M. Davis ...... " "
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—1 return tubular boiler, 100 H. P.
EMP—8. Last fiscal year output 9,000 tons.

OHIO-MICHIGAN COAL CO.
Cannelville, O. No report.

OHIO MNG. & RAILROAD CO.
Horse Shoe Mine; Drift, Seam 44 in. thick.
PO—Mineral City, 0; SP—Same; CTY—Tuscarawas; RR—B. & O.
PR—Ed. Mangenbaugh..Mineral City, O.
TR—Chas. Kolp, " "
GM—H. R. Jenson, " "
PA—H. R. Jenson, " "
EE—George McCarthy, " "
MS—George Ray, " "
S of H—Mules.
S of M—I Elec. mach.
PP—2 Reurn tubular boilers.
EMP—10.

OHIO & PENNA. COAL CO.
General Office, Cleveland, O.
TR—John M. Garfield...Cleveland, O.
GM—F. P. Proeger, " "
EM—D. C. Barton, " "
Sales agent, C. M. Farr, Cleveland, O.

Walnut Hill Mine, Drift, No. 8 Seam, 5 ft. thick.
PO—Yorkville, O. SP—Same. CTY—Jefferson. RR—Penna R. R.
MS—J. C. Nelms ....Yorkville, O.
S of H—8 elec. locos. Track gauge 42 in.
S of M—9 elec. machines.
PP—Power purchased.
EMP—275. Last fiscal year output 90,000 tons.

West Pittsburgh No. 1, Slope, No. 7 Seam, 4½ to 6 ft. thick.
PO—Bergholz, O. SP—Same. CTY—Jefferson. RR—L. S. & M. S.
MS—M. Speicher ......Bergholz, O.
S of H—Rope, mules and 5 elec. loco. Track gauge 42 in.
S of M—9 elec. machines.
PP—4 return tubular boilers, total 600 H. P., 2 gen. units 250 volts D. C.
EMP—250. Last fiscal year output 275,000 tons.

West Pittsburgh No. 2, Shaft, No. 7 Seam, 4 to 6 ft. thick.
PO—Amsterdam, O. SP—Same. CTY—Jefferson. RR—L. S. & M. S.
MS—John Lees ....Amsterdam, O.
S of H—Mules and 4 elec. loco. Track gauge 40 in.
S of M—9 elec. machines.
PP—3 return tubular boilers, total 450 H. P., 1 gen. unit 250 volts D. C.
EMP—250 Last fiscal year output 214,000 tons.

OHIO RIVER COAL CO. (THE)
General Office. Columbus, O.
Drift Mine; No. 8-A Seam; 60 in. thick.
PO—Pomeroy, O. SP—Same. CTY—Meigs. RR—Hocking Valley, River Division.
PR—B. E. Hyde ....Columbus, O.
TR—B. M. Hyde .... " "
GM—B. E. Hyde .... " "
GS—J. J. Meinhart ....Pomeroy, O.
SCO—Address the company. Buyer, J. J. Meinhart, Pomeroy, O.
S of H—Mules. Track gauge 38½ in.
S of M—Hand.
EMP—10. Last fiscal year output 4,213 tons.

PAN-AMERICAN COAL CO. (THE)
PR—H. L. Warner.......Cleveland, O.
TR—Lewis P. Schaus ..Mt. Vernon, O.
GM—Wayne Collier ....Zanesville, O.
PA—Wayne Collier .... " "
EM—Wayne Collier .... " "
Sales agent, Victoria Coal Co., Cleveland, Ohio.

Pan-American Mine. Drift. No. 6 Seam, 3 ft 8 in. to 4 ft. 2 in thick.
PO—Cannelville, O. SP—Same. CTY—Muskingum. RR—Z. & W.
MS—Fred Dunn ......Cannelville, O.
S of H—2 elec. loco. and rope. Track gauge 36 in.
S of M—8 Elec. mach.
PP—2 return tubular boilers, total 300 H. P., 1 gen. unit 250 volts D. C., 2 pumps.
EMP—115. Last fiscal year output 98,000 tons.

Sedalia Mine, Drift, No. 6 Mid Kittanning Seam, 4½ to 5 ft. thick.
PO—Jacksonville, O. SP—Same. CTY—Athens. RR—K. & M.
MS—Wm. Hilt.........Jacksonville, O.
S of H—1 elec. loco. and rope. Track gauge 42 in.
S of M—8 Elec. mach.
PP—2 water tube boilers, total 300 H. P., 1 gen. unit 250 volts D. C., 3 pumps.
EMP—140. Last fiscal year output 138,000 tons.

Guernsey Mine, Shaft, No. 7 Seam, 4½ to 6 ft. thick.
PO—Coal Ridge, O. SP—Same. CTY—Noble. RR—P. R. R.
S of H—1 elec. loco. Track gauge 42 in.
S of M—3 elec. machines.
PP—2 return tubular boilers, total 300 H. P., 1 gen. unit 250 volts D. C., 1 pump.
EMP—50.

Gibbs Mine, Drift, No. 7 Seam. 10 to 12 ft. thick.
PO—Shawnee, O. SP—Same. CTY—Perry. RR—Z. & W.
MS—G. C. Davis.........Shawnee, O.
S of H—Mules. Track gauge 42 in.
S of M—4 elec. machines.
PP—2 return tubular boilers, total 300 H. P., 1 gen. unit 250 volts D. C., 1 pump.
EMP—35. Last fiscal year output 25,000 tons.

Granger Mine, Slope and drift, No. 6 Seam, 4 ft. to 4 ft. 3 in. thick.
PO—Zanesville, O. SP—Same. CTY—Muskingum. RR—B. & O., Z. W.
MS—Thos. Corbett.. So. Zanesville, O.
S of H—1 elec. loco. Track gauge 36 in.
S of M—4 electric machines.
PP—2 return tubular boilers. total 300 H. P., 1 gen. unit 250 volts D. C., 2 pumps.
EMP—70. Last fiscal year output 38,000 tons.

Turkey Run Mine; No. 6 Seam, 42 to 48 in. thick.
PO—Cannelville, O.; SP—Same; CTY—Muskingum; RR—Z. & W.
MS—S. W. Carr.....So. Zanesville, O.
S of H—Elec. loco.
S of M—14 Elec. mach.
PP—Power purchased.
Last fiscal year output 2.000 tons.

PEABODY COAL CO.
Out of business.

PEACOCK COAL CO. (THE)
PR—William Ebersbach....Pomeroy, O.
TR—Frederick Ebersbach.... " "
GM—Fredrick Ebersbach ... " "
PA—Frederick Ebersbach ... " "
GS—Wm. Ebersbach " "
MM—Claude Darst .... " "
EE—Claude Darst .... " "
EM—Thos. Middleton..Middleport, O.
SCO—Red Anchor Dept. Store Co. Buyer, Edward Ebersbach, Pomeroy, O. Red Star Grocery Co. Buyer, Richard Lawhead, Pomeroy, O.
Sales Agents, A. W. Kuhns, Harrison Bldg., Columbus, O.; Puritan Coal Co., Chicago, Ill.

The Charter Oak Mine, Drift, Pomeroy or 8-A Seam, 4½ to 5½ ft. thick.
PO—Pomeroy, O. SP—Same. CTY—Meigs. RR—Hocking Valley.
MS—H. V. Carl ....Pomeroy, O.
S of H—Mules and 3 elec. loco. Track gauge 38½ in.
S of M—13 elec. machines.
PP—2 Babcock & Wilcox water tube boilers, total 800 H. P., 1 gen. unit 2,300 volts A. C., 3 phase, 60 cycle, 2 pumps. (Central Power Station Charter Oak Rolling Mill and Forest Run Mines.)
EMP—183. Last fiscal year output 83,413 tons.

Forest Run Mine; Shaft; No. 8 Pomeroy Seam, 54 in. thick.
PO—Pomeroy, O.; SP—Same; CTY—Meigs; RH—H. V.
MS—Ed Griffiths.........Pomeroy, O.
S of H—Mules; track gauge, 42 in.
S of M—10 Elec. mach.
PP—From central plant; 1 pump.
EMP—38.
Commenced operations in December, 1914.

Rolling Mill Mine, Drift, Pomeroy or 8-A Seam, 4½ to 5½ ft. thick.
PO—Pomeroy, O. SP—Same. CTY—Meigs. RR—Hocking Valley.
MS—James Duckworth ....Syracuse, 0
S of H—Mules and 4 Elec. loco. track gauge 38½ in.
S of M—14 elec. machines.
PP—Power plant at Forest Run Mine.
EMP—195. Last fiscal year output 109,746 tons.

PINEY FORK COAL CO.
General Office, Columbus, O.
Stripping Mine; Pgh. No. 8 Seam, 55 to 63 in. hick.
PO—Weems, O.; SP—Smihfield, O.; CTY Jefferson; RR—W. P. T.
PR—J. W. Blower Columbus,0
TR—J. W. Blower........ " "
PA—J. W. Blower, " "
S of H—2 Steam loco.
S of M—2 Steam shovels, elecric driven.
PP—Purchased power.

PITTSBURG-BELMONT COAL CO.
PR—Alexander Neff..........Neffs, O.
GS—Franklin Neff ....Neffs, O.
PA—Franklin Neff, " "
TR—J. F. Mellott.........Bellaire, O.
EM—I. Nichol.......St. Clairsville, O.
EE—C. C. Neff...............Neffs, O.
SCO—The Neff Store Co., " "
Sales agency, B. & O. Coal Co., Cleveland, O.

Neff Nos. 1 and 2, Drifts, Pittsburgh No. 8 Seam, 5 to 6 ft. thick.
PO—Neffs, O. SP—Same. CTY—Belmont. RR—B. & O.

S of H—Mules and 9 elec. loco.
S of M—18 elec. machines.
PP—8 return tubular boilers.
EMP—449.

Pittsburg-Belmont No. 3, Slope, Pittsburg No. 8 Seam, 5 to 6 ft. thick. thick.
PO—Lafferty, O. SP—Same. CTY—Belmont. RR—B. & O.
S of H—6 elec. loco.
S of M—8 elec. machines.
PP—5 return tubular boilers.
EMP—110.

PITTSBURGH & CLEVELAND COAL CO.
General Office, Cleveland, Ohio.
PR—W. D. Sauters....Cleveland, O.
TR—W. D. Sauters..... " "
PA—C. S. Deal, " "
GM—J. E. Stilwell....Martins Ferry, O.
GS—J. E. Stilwell, " "
EE—Geo. Buchanan .. " "
EM—D. E. Elkin.......Bellaire, O.
Sales agent, Sauters Coal Co., Cleveland, Ohio.

Gaylord No. 1, Drift, No. 8 Pittsburg Seam, 5 to 7 ft. thick.
PO—Martins Ferry, O. SP—Same. CTY—Belmont. RR—C. & P. Div., Penna lines.
MS—Robert Swoden ..Martins Ferry, O.
S of H—5 elec. locos. Track gauge 36 in.
S of M—9 elec. mach.
PP—1 pump, 3 return tubular boilers, total 450 H. P., 2 gen. units, 250 volts D. C.
EMP—200.

Gaylord No. 2, Drift, No. 8 Pittsburg Seam, 5 to 7 ft. thick.
PO—Martins Ferry, O. SP—Seam; CTY—Belmont. RR—C. & P. Div. Penna. lines.
MS—Richard Delbridge.Martins Ferry O.
S of H—1 elec. loco. Track gauge 36 in.
S of M—5 elec. machines.
PP—1 pump. Power furnished from No. 1 mine.
EMP—200.

PITTSBURGH MINING CO. (THE)
Hatfield Mine, Drift and Shaft, Pittsburg 8-9 or Pomeroy Seam, 4½ ft. thick. Washery Kanauga, O.
PO—Minersville, O. SP—Pomeroy, O. CTY—Meigs. RR—Hocking Valley.
PR—G. Hartweg ......Covington, Ky.
TR—J. T. Hatfield .... " "
GM—Wm. W. Miller.....Pomeroy, O.
GS—Wm. W. Miller ..... " "
PA—Wm. W. Miller ..... " "
MS—John D. Strickland.Minersville, O.
EM—Ohio Eng. & Contracting Co., Pomeroy, O.
EE—John Elliott.
SCO—Pittsburgh Store. Buyer, I. R. Karr, Minersville, O.
S of H—Mules, 3 elec. loco. Track gauge 38½ inches.
S of M—13 elec. machines.
PP—500 volts D. C. Power purchased, 2 pumps.
EMP—225. Daily capacity 1,000 tons.
Sales agent, Wm. W. Miller Pomeroy, Ohio.

PITTSBURGH-SUPERIOR COAL CO.
General Office, Shadyside, O.
Cook Mine; Slope; Pittsburgh No. 8 Seam; 72 in. thick.
PO—Shadyside, O.; SP—Wegee, O.; CTY—Belmont; RR—Penna.
PR—James F. Cook,
10 Union Ave., Crafton, Pa.
GM—James F. Cook,
10 Union Ave., Crafton, Pa.
PA—James F. Cook,
10 Union Ave., Crafton, Pa.
TR—James C. Cook,......Shadyside, O.
MS—Frank Roci.........Shadyside, O.
MM—James C. Cook " "
EE—James C. Cook, " "
S of H—Rope.
S of M—Hand.
PP—1 return tubular boiler, total 100 H. P., 1 pump.
EMP—17.

PLUTO COAL CO. (THE)
General Office, Rayland, O.
Portland Mine; Drift; Pgh. No. 8 Seam, 60 in. thick.
PO—Rayland, O.; SP—Same; CTY—Jefferson; RR—W. & L. E.
PR—Chas. A. Miller......Rayland, O.
GM—Chas. A. Miller, " "
GS—Chas. A. Miller, " "
PA—Chas. A. Miller, " "
MS—Chas A. Miller, " "
EM—M. D. Gibson, " "
MM—W. W. Brenner, " "
CE—M. D. Gibson, " "
EE—Patrick Bell, " "
TR—D. C. Eaton......Pittsburgh, Pa.
S of H—1 Elec. loco and mules; track gauge, 42 in.
S of M—5 elec. mach.
PP—1 Erie return tubular boiler, total 150 H. P., gen. unit, 250 volts D. C., 2 pumps.
EMP—55.
Sales Agent, D. C. Eaton, Rayland, O.

POCOCK COAL CO. (THE)
No. 4 Mine, Shaft, Massillon No. 1 Seam, 6 to 5 ft. thick.
PO—Massillon, O. SP—Same. CTY—Stark. RR—W. & L. E. Ry.
PR—J. F. Pocock......Massillon, O.
TR—J. C. Haring ...... " "
GM—J. C. Haring ...... " "
PA—J. C. Haring ...... " "
MS—Wm. Kutz .... " "
S of H—Mules.
S of M—5 elec. machines.
EMP—260. Last fiscal year output 78,000 tons.

PORTER BROTHERS.
South Avenue Mine; Shaft; 30 in. thick.
PO—Poland, O; CTY—Mahoning;
GS—D. D. Porter, Poland O.
PP—1 pump.
Emp—6. Last fiscal year output 1900 tons.

PORTSMOUTH REFRACTORIES CO. (THE)
Nos. 4 and 5 Mines; Drift; Nos. 4 and 5 Seams; 4 to 4½ ft. thick.
PO—Firebrick, O. SP—Same. CTY—Lawrence; RR—B. & O., S. W. Ry.
TR—W. L. Hitchcock...Firebrick, O.
GM—W. L. Hitchcock... " "
GS—W. S. Hamilton, " "
PA—W. S. Hamilton, " "
MS—H. Heller...........Firebrick, O.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—1 pump.
EMP—20. Last fiscal year output 10,000 tons.

POSTON CONS. COAL CO. (THE)
General Office, Athens. Ohio.
PR—C. L. Poston.........Athens, O.
TR—T. R. Biddle .... " "
GM—L. D. Poston .... " "
PA—L. D. Poston .... " "
EM—R. A. Van Dyke, " "
GS—V. F. Cox, " "
MM—Wm. Campbell.........Millfield, O
EE—Henry Bailey and Herb Bailey, Millfield, O.
SM—J. F. Kiener ......Millfield, O.
Sales Agent, Wm. Harper, 906 Citizens' Bldg., Cleveland, O.

No. 6 Mine, Shaft, No. 6 Hocking Seam, 6 ft. thick.
PO—Millfield, O. SP—Same. CTY—Athens; RR—T. & O. C. and K. & M.
MS—John Brewer..........Millfield, O.
S of H—6 elec. locos. Track gauge 42 in.
S of M—8 elec. mach.
PP—6 Erie return tubular boilers, total 900 H. P., 250 K. W., 250 volts D. C.
EMP—200. Last fiscal year output 100,000 tons.

No. 7 Mine; Slope; No. 7 Hocking or Bailey Run Seam, 54 in. thick.
PO—Millfield, O. SP—Same. CTY—Athens. RR—T. & O. C.
MS—Reese West...........Millfield, O. ft. 6 in.
S of H—5 elec. locos. Track gauge 42 in.
S of M—7 elec. mach.
PP—2 Erie return tubular boilers, total 300 H. P., 150 K. W., 250 volts D. C.
EMP—196. Last fiscal year output 157,000 tons.

POWER COAL CO.
Power Mine, Drift, No. 6 Seam, 3 ft. 40 to 52 in. thick.
PO—Coshocton, O. SP—Same. CTY—Same. RR—W. & L. E.
GS—Wm. Power........Coshocton, O.
PA—A. J. Power ...... " "
MS—A. J. Power ......
S of H—Mules. Track gauge 32 in.
S of M—1 elec. mach.
PP—Motor generator set, 4000 volts A. C., 250 volts D. C., 1 pump, purchase power.

PROGRESS COAL CO.
General Office, 1240 Leader News Bldg. Cleveland, O.
Pauline No. 1 Mine.
PO—Bannock, O.; SP—Same; CTY—Belmont.

PROGRESSIVE COAL CO. (THE)
Morgan Mine, Drift, Pittsburg Seam No. 8, 5½ ft. thick.
PO—Bellaire, O. SP—Same. CTY—Belmont; RR—B. & O.
PR—M. T. Garrett......Bellaire, O.
TR—R. W. Hall .... " "
GM—R. W. Hall ...... " "
GS—R. W. Hall ...... " "
PA—R. W. Hall ...... " "
EM—A. J. Harbaugh......Bellaire, O.
S of H—Mules. Track gauge 36 in.
S of M—1 elec. machine.
PP—2 pumps. Purchase power.
EMP—20. Last fiscal year output 17,269 tons.
Sales Agent, R. W. Hall, Bellaire, O.

PROSPECT HILL COAL CO.
Out of business.

PROVIDENT COAL CO. (THE)
General Office, Cleveland, O.
PR—W. P. Murray ....Cleveland, O.
VP—G. D. Cameron..... " "
TR—E. P. Williams..... " "
GM—Frank Armstrong ... " "
PA—H. S. Pickands.....Cleveland, O.
GS—W. L. McDonald..St. Clairsville, O.
Sales agents, Pickands, Mathers & Co., Cleveland, O.

Provident Mine No. 1, Shaft, Pittsburg No. 8 Seam, 5 ft. 8 in. thick.
PO—St. Clairsville, O. SP—Provident, O. CTY—Belmont. RR—W. & L. E., Adina Branch.
MS—Hugh Gaffney, ..St. Clairsville, O.
S of H—Mules and 5 Jeffrey elec. loco. Track gauge 42 in.
S of M—18 elec. machines.
PP—2 water tube and 4 return tubular boilers, total 1,300 H. P., 3 gen. units, 2,300 volts A. C., 60 cycle and 250 volts D. C., 1 air compressor and 2 pumps.
EMP—427.

Provident Mine No. 2, Drift, Pittsburg No. 8 Seam, 5½ ft. thick.
PO—Fairpoint, O. SP—Same. CTY—Belmont. RR—B. & O., C. L. & W.
MS—W. L. McDonald...Fairpoint, O.
S of H—Mules and 3 Jeffrey elec. loco. Track gauge 42 in.
S of M—16 Jeffrey elec. machines.
PP—Power supplied by No. 1 mine. 1 air compressor and 2 pumps.
EMP—400.

PURITAN BRICK CO.
General Office, Hamden, O.
Puritan No. 6 Mine; Drift; No. 6 Seam; 46 to 50 in. thick.
PO—Hamden O.; SP—Same; CTY—Vinton; RR—H. V.
PR—J. W. Morrison,.....Detroit, Mich.
TR—H. P. Harding,........Hamden, O.
PA—H. P. Harding, " "
CE—Prof. J. R. Allen, Ann Arbor, Mich.
MS—F. C. Morgan......Wellston, O.
EE—G. M. Hicks........Hamden, O.
S of H—1 Elec. loco and mules; track gauge, 42 in.
S of M—2 Elec. mach.
PP—2 Sterling water tube boilers, total 800 H. P., 2 gen. units, 250 and 550 volts D. C., 3 phase, 60 cycles.
EMP—25. Last fiscal year output, 15,000 tons.
Sales Agent, J. W. Morrison, Detroit, Mich.

PURITAN COAL CO. (THE)
Puritan Mine, Shaft, No. 7 Seam, 8 to 5½ ft. thick.
PO—Cambridge, O. SP—Byesville, CTY—Guernsey. RR—Penna lines, C. & M. Div.
PR—R. H. Mills.......Coshocton, O.
TR—L. B. Birney........Cambridge, O.
GM—W. A. Lucas .... " "
PA—W. A. Lucas ..... " "
EE—Ellis Albright........Byesville, O.
S of H—Mules and 3 elec. loco. Track gauge 42 in.
S of M—5 elec. machines.
PP—3 Union Iron Works return tubular boilers, total 450 H. P., 3 gen. units, 250 volts D. C., 4 pumps.
EMP—230. Last fiscal year output 138,553 tons.

PURSGLOVE-MAHER COAL CO. (THE)
General Office, Cleveland, Ohio.
PR—Joseph Pursglove ....Cleveland, O.
TR—Thos. K. Maher.... " "
GM—Thos. W. Pursglove.Bridgeport, O.
Sales Mgr., R. L. Criswell, Cleveland, O.

Heinlein Mine, Drift, Pittsburgh No. 8 Seam, 5½ ft. thick.
PO—Neff, O. SP—Same. CTY—Belmont. RR—B. & O. and W. & L. E.
MS—David Pursglove ....Neff, O.
SM—W. P. Hunt............Neffs, O.
S of H—4 elec. loco. Track gauge 36 in.
S of M—8 elec. machines.
EMP—275. Annual output 324,863 tons.

Maher Mine, Slope, Pittsburgh No. 8 Seam, 5½ ft. thick.
PO—Glencoe, O. SP—Same. CTY—Belmont. RR—B. & O. R. R.
MS—Samuel Pursglove....Glencoe, O.
S of H—4 elec. loco. Track gauge 42 in.
S of M—7 elec. machines.
PP—3 water tube boilers, total 450 H. P., 2 pumps, 1 gen. unit, 250 volts.
EMP—210. Annual output 204,000 tons.

Pursglove Mine, Drift, Pittsburgh No. 8 Seam, 5½ to 6 ft. thick.
PO—Stewartsville, O. SP—Same. CTY—Belmont. RR—B. & O.
MS—Sam. Pursglove ......Glencoe, O.
S of H—3 elec. loco. Track gauge 42 in.
S of M—10 elec. machines.
PP—2 water tube boilers, total 300 H. P.
EMP—236. Annual output 236,000 tons.

Lydia Mine, Drift, Pittsburgh No. 8 Seam, 6 to 5½ ft. thick.
PO—Maynard, O. SP—Same. CTY—Belmont. RR—B. & O. R. R.
MS—T. W. Pursglove.....Bridgeport, O.
S of H—2 elec. loco. Track gauge 42 in.
S of M—10 elec. machines.
PP—2 water tube boilers, total 300 H. P.

QUINN COAL CO.
General Office, Minerton, O.
Murphy Mine; Drift, No. 4 Seam, 42 to 54 in. thick.
PO—Alice, O.; SP—Minertown, O.; CTY—Gallia; RR—H. V., River Div.
TR—Jas. J. Murphy......Lancaster, O.
GM—Jas. J. Murphy, " "
PA—Jas. J. Murphy, " "
MS—Jas. J. Murphy, " "
MM—John Refsinger..........Alice, O.
S of H—Mules and rope; track gauge 36 in.
S of M—Hand.

RAIL & RIVER COAL CO.
General Office, Cleveland, O.
PR—W. R. Woodford....Cleveland, O.
TR—D. W. Miller, " "
Auditor—Wm. P. Cayton, " "
GM—Walter S. Kelley......Bellaire, O.
GS—Wm. Maloney, " "
PA—St. Clair Archer, " "
Sales Agency, Address the Company,

No. 1 Mine; Drift; Pgh. Seam, 60 to 70 in. thick.
PO—Bellaire, O.; SP—Same; CTY—Belmont; RR—P. R. R., Cleve. & Pgh. Div.

S of H—5 Elec. loco.; track gauge, 42 in.
S of M—14 Elec. mach.
PP—2 Keeler water tube boilers, total 800 H. P., 3 gen. units, 500 volts D. C., 2 pumps.
EMP—450. Last fiscal year output 2,500 tons daily.

No. 3 Mine; Slope; Pgh. Seam, 60 to 72 in. thick.
PO—Bellaire, O.; SP—Aults, O.; CTY—Belmont; RR—B. & O., Main Line.
S of H—3 Elec. loco.; track gauge, 42 in.
S of M—11 Elec. mach.
PP—1 W. T. Geary water tube, 2 W. T. Geary return tubular boilers, total 560 H. P.
EMP—250. Last fiscal year output, 2,000 tons daily.

No. 6 Mine; Drift; Pgh. Seam, 60 to 72 in. thick.
PO—Bellaire, O.; SP—Same and McLainsville, O.; CTY—Belmont; RR—B. & O., Main Line.
S of H—2 Elec. loco. and mules; track gauge, 42 in.
S of M—10 Elec mach.
PP—1 W. T. Geary water tube, 2 W. T. Geary return tubular boilers, total 560 H. P., 2 gen. units, 500 volts D. C.
EMP—350. Last fiscal year output, 2,000 tons daily.

REDBUD COAL CO.
Redbud Mine, Drift, No. 6 Seam, 3 to 4 ft. thick.
PO—Cannelville, O. SP—Same. CTY—Muskingum. RR—Z. & W.
TR—W. H. Blaney ...Cannelville, O.
GM—W. H. Blaney .... " "
PA—W. H. Blaney .... " "
GS—James Rush ...... " "
S of H—Rope. Track gauge 36 in.
S of M—Hand. Shooting.
PP—1 boiler, 125 H. P.
EMP—30. Annual output 30,000 tons.
Idle during past year.

REESE BROS.
See John T. Reese & Son.

REESE JOHN T. & SON.
General Office, Salem, O.
Beech Hollow Mine; Drift; No. 3 Vein; 36 to 42 in. thick.
PO Salem, O; SP—Same; CTY—Columbiana RR— Y. & O.
PR—John T. Reese,.........Salem, O.
TR—John T. Reese, " "
PA—John T. Reese, " "
GS—Joseph G. Reese, " "
MS—Joseph G. Reese, " "
S of H—Mules & Rope.
S of M—Hand.
PP—2 boilers, total 100 H. P.
EMP—12. Last fiscal year output, 8,000 tons.
Note—Formerly known as Reese Bros.

REEVES COAL CO.
PR—C. C. Fernsell.New Philadelphia, O.
TR—C. C. Fernsell.. " "
GM—C. G. Knisely .. " "
PA—C. G. Knisely .. " "
EE—Peter Pollock .... " "
Sales agent, C. G. Knisely, New Philadelphia, O.

Reeves Mine No. 2, Drift, No. 6 Seam, 3 ft. 10 inches to 4½ ft. thick.
PO—New Philadelphia, O. SP—Same. CTY—Tuscarawas. RR—Penna R. R., C. & P. Div.
MS—Peter Pollock, New Philadelphia, O.
S of H—Mules and 3 elec. loco. Track gauge 42 in.
S of M—6 elec. and 21 compressed air machines.
PP—1 water tube and 1 return tubular boiler, total 500 H. P., 1 gen. unit, 250 volts D. C., 1 air compressor and 4 pumps.
EMP—225. Last fiscal year output 149,600 tons.

Reeves Mine No. 1, Drift, No. 6 Seam, 3 ft. 10 inches to 4½ ft. thick.
PO—New Philadelphia, O. SP—Same. CTY—Tuscarawas. RR—Penna R. R., C. & P. Div.
MS—Geo. Dean....New Philadelphia, O.
S of H—Mules and 3 elec. loco. Track gauge 36 in.
S of M—Pick.
EMP—100. Last fiscal year output 51,600 tons.

RICE, W. P. MINING CO. (THE)
General Office, Dayton, O.
No. 1 Mine; Shaft, No. 7 A Seam, 50 to 71½ in. thick.
PO—Glouster, O.; SP—Same; CTY—Athens; RR—T. & O. C.
PR—W. P. Rice, ...Dayton, O.
GM—W. P. Rice, " "
PA—J. W. Rice, " "
TR—J. W. Rice, " "
GS—Henry Shires..........Glouster, O.
MS—Henry Shires, " "
EM—James Richards, " "
S of H—1 Elec. Loco.
S of M—3 elec. mach.
PP—1 Return tubular boiler, 150 H P., 1 gen. unit 100 K.W., 250 volts D. C., 1 pump.
EMP—100.
Sales agents,.. P. Rice Mining Co., Dayton, O.

RIVERVIEW COAL & MNG. CO.
Riverview Mine, Drift.
PO—Cheshire, O.; SP—Silver Run, O.; CTY Gallia RR—H. V.
PR—W. E. Williams........Rutland, O.
GM—W. E. Williams........Rutland, O.
TR—W. A. Brennan......Middleport, O.
MS—John True.........Middleport, O.
CE—A. Sheldon ......Middleport, O.
SCO—Riverview Supply Co. Buyer, E. Herman.
S of H—1 Elec. loc.
S of M—4 Elec. mach.
PP—1 pump, 1 return tubular boiler, 150 H. P., 1 gen. unit 250 volts D. C.
EMP—20.
(Old information.)

ROBBINS COAL CO., C. (THE)
Robbins Mine, Drift, No. 6 Hocking Seam, 4 to 7 ft. thick.
PO—Nelsonville. SP—Same. CTY—Athens. RR—H. V. R. R.
PR—John C. Baird......Nelsonville, O.
TR—C. L. Baird.... " "
GM—John C. Baird.. " "
PA—John C. Baird.. " "
GS—Wm. Burnell .... "
S of H—4 elec. loco. Track gauge 42 in.
S of M—6 elec. mach.
PP—1 gen. unit, 2,300 volts A. C., 3 phase, 60 cycle, power purchased.
EMP—105. Annual output 88,167 tons.
Sales agents, E. A. Cole & Co., Columbus, Ohio.

ROBINSON-GRAVES SEWER PIPE CO.
Robinson Graves Mine; Slope; No. 6 Seam; 4 to 4½ ft. thick.
PO—Uhrichsville, O. SP—Same. CTY—Tuscarawas; RR—B. & O. and P. H.
PR—Andrew Robinson....Uhrichsville, O.
GM—A. Robinson .... " "
PA—A. Robinson .... " "
SM—A. Robinson, " "
TR—C. L. Graves......Uhrichsville, O.
MS—Wm. Tanzie, " "
CE—Geo. Arnold..New Philadelphia, O.
S of H—Mules. Track gauge 33 in.
S of M—Hand.
PP—2 Atlas boilers, total 300 H. P., 2 pumps. Purchase power.
EMP—20. Last fiscal year output 23,000 tons.
Sales agent, A. Robinson.

ROBY COAL CO (THE).
General Office, Cleveland, O.
Somers Nos. 1 and 2 Mines; Drift; Pgh. No. 8 Seam.
PO—Adena, O.; SP—Same; CTY—Jefferson; RR—W. & L. E.
PR—C. W. Somers........Cleveland, O.
GM—C. W. Somers, " "
TR—Geo. P. Steele, " "
PA—G. E. Keidel, " "
GS—W. L. Moke,.........Adena, O.
EM—Wm. Hibbs—...........Scio, "
SCO—(1) Enterprise Supply Co.,, Adena, O.
(2) H. Walker's Store, " "
S of H—7 Elec loco.
S of M—38 Elec. mach.
PP—5 Erie, 5 Atlas, water tube boilers, total 1,500 H. P., 4 gen. units, 250 volts D. C., 8 pumps.
EMP—1,100. Output for three months, 180,000 tons.

ROYAL FLUSH MINING CO.
Royal Flush Mine, Drift, No. 6 Seam, 66 in. thick.
PO—New Straitsville, O.; SP—Same; CTY—Perry; RR—B. & O.
PR—Henry Watkins, New Straitsville, O.
TR—Henry Watkins " "
PA—Henry Watkins " "
GM—A. L. Groff, " "
MS—A. L. Groff " "
CE—Evan Reese......New Lexington, O.
EM—Evan Reese, " "
EE—Frank Clark..........Shawnee, O.
S of H—Mules and 1 elec. loco. Track gauge 42 in.
S of M—1 Electric machine.
PP—Boiler, 62½ H. P., 250 volts D. C. and power purchased.
EMP—41. Output for 6 months 12,500 tons.

RUSSELL COAL & MNG. CO. (THE)
General Office, Cleveland, Ohio.
Russell Mine, Drift, Pittsburgh No. 8 Seam, 5 ft. 4 in. thick.
PO—Tiltonsville, O. SP—Same. CTY—Jefferson. RR—C. & P. Div. Penna Co.
PR—A. M. McKitterick.
TR—G. C. McKitterick.
GM—G. C. McKitterick.
GS—G. C. McKitterick.
PA—G. C. McKitterick.
CE—D. A. Elkin ....Bellaire, O.
EE—C. M. Johnson....Tiltonsville, O.
MS—Seth Williams .... " "

(Continued on Next Page.)

Russell Coal & Mining Co. (The)—Cont.
S of H—2 elec. locos. Track gauge 40 in.
S of M—6 elec. machines.
EMP—140. Buy power.

RUSSELL RUN COAL COMPANY
General Office, Pomeroy, Ohio.
Russell Run Mine; Drift; Pittsburg No. 8 Seam; 54 to 66 in. thick.
PO—Pomeroy, O.; SP—Hobson, O.; CTY—Meigs; RR—K. & M., Middleport & Northeastern branch.
PR—Benjamin Sweazey.......Logan, O.
TR—J. G. Blosser.....Carbon Hill, O.
GM—J. T. Sweazey........Pomeroy, O.
GS—J. T. Sweazey, " "
PA—J. T. Sweazey, " "
MS—Date Thomas, R. F. D., Rutland, O.
EM—Geo. Sherman......Middleport, O
SCO—Edw. French, " "
S of H—Mules and 1 elec. loco.
S of M—2 elec. mach.
PP—Purchase power.
EMP—65. Last fiscal year output 29,327.25 tons.

RUTLEDGE, R. W.
East Port No. 1 Mine; Drift; No. 6 Seam 50 to 54 in. thick.
PO—Midvale, O; SP—Same CTY—Tscarawas; RR—Penna.
PR—R. W. Rutledge,......Midvale, O.
TR—R. W. Rutledge, " "
GM—R. W. Rutledge, " "
GS—R. W. Rutledge, " "
PA—R. W. Rutledge, " "
MS—Walter Gribble, " "
S of H—Mules. Track gauge 36 in.
PP—1 pump.
EMP—9. Last fiscal year output, 14,400 tons.

ST. CLAIR COAL CO. (THE)
Now Glen's Run Coal Co.

SALEM MINING CO.
Salem Mine, Drift; No. 3 Seam, 42 in. thick.
PO—Salem, O.; SP—Salem Mines, O.; CTY—Columbiana; RR—Y. & O.
PE—Chas. Estep..........Windber, Pa.
VP—A. M. Bloom...Scalp Level, Pa.
TR—J. E. Reese, " "
GM—J. H. Giffin.............Salem, O.
PA—J. H. Giffin, " "
MS—John Robusch, " "
EM—C. E. Vaughn....E. Palestine, O.
S of H—2 Elec. locos.; track gauge 38 in.
S of M—3 elec. mach.
PP—1 Return tubular boiler, 150 H. P., 1 gen. unit 250 volts D. C., 2 pumps.
EMP—16. Last fiscal year output 28,700 tons.
Sales Agent, J. H. Giffin, Salem, O.

SANBORN COAL COMPANY.
Sanborn Coal Co., Mine; 72 in. thick.
PO—R. F. D. No. 4, Nelsonville, O; SP—Carbon Hill; CTY—Athens; RR—Hocking Valley, Sand Run Br.
PR—Chas. Schultz,.....Nelsonville, O.
TR—W. E. Sanborn, " "
GM—W. E. Sanborn, " "
GS—W. E. Sanborn, " "
PA—W. E. Sanborn, " "
S of H—Horses and electricity.
S of M—1 elec. mach.
PP—1 pump. Alternating current. Purchase power.
EMP—50. Daily output, 600 tons.

SAND RUN COAL CO.
Drift; Seam 7 ft. thick.
PO—Carbon Hill, O.; SP—Same; CTY—Hocking; RR—H. V.
PR—C. E. Stribling....Carbon Hill, O.
TR—T. E. Green, " "
GM—C. A. Green, " "
PA—Bert Green, " "
S of H—Horses; track gauge 42 in.
S of M—1 Elec. mach.
PP—1 pump; power purchased.
EMP—18. Last fiscal year output 27,000 tons.

SCHICK CO-OPERATIVE COAL CO. (THE).
Schick's Mine; Drift; No. 8 Seam.
PO—Bellaire, O.; SP—Same; CTY—Belmont; RR—B. & O.
PR—M. J. Schick........Bellaire, O.
MS—M. J. Schick, " "
TR—John A. Schick, " "
EM—A. J. Harbaugh....Shadyside, O.
S of H—Elec. loco.
S of M—Elec. mach.
PP—Boiler, 150 H. P., gen units, 250 volts D. C.
EMP—125.
Successors to M. J. Schick & Co.

SCHMIED & DAILEY COAL CO.
General Office, Coshocton, O.
Locust Grove Mine; Drift; No. 6 Seam; 36 to 50 in. thick.
PO—Coshocton, O; SP—Same; CTY—Coshocton; RR—W. & L. E.
PR—J. N. Dailey, ...Coshocton, O.
GS—J. N. Dailey, " "
GM—J. N. Dailey, " "
TR—Paul A. Schmied, " "
PA—Paul A. Schmied, " "
MS—Wm. Gilgannon, " "
S of H—Mules.
EMP—20. Last fiscal year output, 12,000 tons.
Note—Successors to Locust Grove Coal Company.

SCHULER, J. F. & SONS.
General Office, Sharpsbury, O.
PR—J. F. Schuler......Sharpsbury, O.
TR—J. F. Schuler, " "
GM—W. F. Schuler, " "
SM—S. A. Schuler, " "
MM—Wm. White........Broadwell, O.

Selley Mine; Drift; Seam 84 in. thick.
PO—Sharpsbury, O.; SP—Same; CTY—Athens; RR—M. C. & C.
MS—E. J. Schuler......Sharpsbury, O.
S of H—Horses.
S of M—1 Elec. mach.
PP—Jeffrey boilers, total 60 H. P., 1 gen. unit 250 volts D. C.
EMP—15.

Schuler No. 1 Mine; Slope; Pittsburgh No. 8 Seam, 48 to 49 in. thick.
PO—Broadwell, O.; SP—Same; CTY—Athens; RR—M. C. & C.
PR—J. F. Schuler, ...Broadwell, O.
TR—J. F. Schuler, " "
GM—W. F. Schuler, " "
MS—W. F. Schuler, " "
MM—William White, " "
S of H—1 Steam loco.; track gauge 41 in.
S of M—1 Elec. mach.
PP—1 Return tubular boiler, 1 gen. unit 250 volts D. C.
EMP—14. Last fiscal year output 5,000 tons.

SCOTT COAL COMPANY
B No. 2 Mine; Drift; No. 7 Seam; 52 in. thick.
PO—Midvale, O.; SP—Same; CTY—Tuscarawas; RR—B. & O. ......
PR—John S. Scott........Midvale, O.
TR—John S. Scott " "
PA—John S. Scott " "
GM—T. L. Scott ..New Philadelphia, O.
EE—T. L. Scott..New Philadelphia, O.
GS—C. O. Scott ....Midvale, O.
S of H—1 elec. loco. Track gauge 42 in.
S of M—Hand and 3 elec. mach.
PP—2 Erie water tube boilers, total 300 H. P., 1 gen. unit, 250 Volts D. C., 1 pump.
EMP—40. Last fiscal year output 12,000 tons.

SCOTT, W. O.
Scott Mine; Drift; No. 7 Seam; 48 to 66 in. thick.
PO—Dennison, O; CTY—Tuscarawas;
MS—W. O. Scott.........Dennison, O.
S of H—Mules.
EMP—9. Last fiscal year output, 7,414 tons.

SHAWNEE FLASH BRICK CO.
PO—Columbus, O.
Mine coal for own use only.

SHEETS COAL CO.
Sheets Mine, Drift, No. 8 Pittsburgh Seam; 60 ins. thick.
PO—Martins Ferry, Ohio, SP—Same; CTY—Belmont; RR—B. & O. and C. & P.
GM—James Ralston..Martins Ferry, O.
GS—James Ralston, " "
PA—James Ralston, " "
S of H—2 elec. loco. Track gauge 34 in. in.
S of M—2 Elec. mach.
PP—2 pumps.
EMP—15. Last fiscal year output 10,000 tons.

SHERMAN COAL CO.
PO—Middleport, O.; CTY—Meigs.
PR—Jacob Sherman......Middleport, O.
GS—Ed. Sherman, " "
EM—Geo. Sherman.

Sherman Mine; Drift; No. 8 Seam; 42 to 54 in. thick.
PO—Middleport; SP—Hobson; CTY—Meigs; RR—K. & M.
S of H—Mules and 1 elec. loco. Track gauge 44 in.
S of M—2 elec. mach.

SIMONS, A. & SON.
Chestnut Ridge Mine No. 3; Drift, No. 5 Seam, 42 to 48 in. thick.
PO—Redfield, O.; SP—Saltillo, O.; CTY—Perry; RR—Z. & W.
PR—A. Simons............Redfield, O.
GM—A. Simons, " "
SM—Paul Noon, " "
EM—Clem Pettit, " "
EE—J. F. Conaway, " "
S of H—1 Elec. loco.
S of M—3 elec. mach.
PP—1 return tubular boiler.
EMP—60. Last fiscal year output 24,721 tons.

SINES BROS. & CO.
Drift Mine; No. 6 Seam; 48 to 96 in. thick
PO—New Straightsville, O.; CTY—Perry; RR—H. V.
PR—Robert Lines..New Straightsville, O.
TR—John D. Martin, " "
S of H—Mules and 1 elec. loco. Track gauge 42 in.
S of M—1 elec. mach.
PP—1 pump. Purchase power.
EMP—14. Last fiscal year output 23,000 tons.
Mine coal for their own use.

SKIDMORE COAL CO. (THE).
General Office, Nelsonville, O.
Noble Summit Mine; Drift; A Eight Seam, 60 to 64 in. thick.
PO—Rutland, O.; SP—Same; CTY—Meigs; RR—K. & M.
PP—Waldo Chute.......Nelsonville, O.
GM—Waldo Chute, " "
EM—Waldo Chute, " "
TR—D. A. Ferree, " "
GS—C. E. Bryan,.........Rutland, O.
PA—E. C. Bryan, " "
S of H—Mules.
S of M—1 Elec mach.
PP—1 Gas engine, 1 pump. 250 volts D. C.
EMP—15,000 tons.

SLOAN, C .A., COAL CO.
Hurd No. 2, Shaft, No. 2 Seam, 36 in. thick.
PO—Jackson, O., SP—Davisville, O., CTY—Jackson; RR—D. T. & I. and H. V.
PR—C. A. Sloan........Jackson, O.
PA—C. A. Sloan, " "
MS—C. A. Sloan, " "
EM—Thos. Lloyd, " "
S of H—Mules; track gauge 38 in.
S of M—Hand.
PP—1 Return tubular boiler 45 H. P., 1 pump.
EMP—14. Annual output 6,500 tons.

SMITH COAL CO.
New Berlin, O. No report.

SONNHALTER COAL CO.
Massillon, O. No report.

STANDARD HOCKING COAL CO.
General Office, Chicago, Ill.
Standard Hocking Mine, Drift, No. 6 Seam 3½ ft. thick.
PO—Crooksville, O.; SP—Same; CTY—Perry; RR—Penna.
PR—Jos. P. Rend......Chicago, Ill.
GM—Jos. P. Rend, " "
MS—N. B. Snell......Crooksville, O.
MM—John Smith, " "
EM—T. C. Connar....Zanesville, O
S of M—10 Elec. mach.
S of H—Mules and 2 Elec. loco.; track gauge 42 in.
PP—2 Erie water tube boilers, total 300 H. P., 2 gen. units, 250 volts, D. C., 2 pumps.
EMP—190. Last fiscal year output 92,000 tons.

STERLING COAL CO., Ltd.
General Office, Cleveland, Ohio.
2 Mines in Ohio and 1 in West Va.
PR—C. B. McNaught..Toronto, Can.
TR—H. G. Ratcliffe, " "
GM—H. D. Hileman....Cleveland, O.
PA—F. M. Kirk, " "
EE—E. B. McNichols...Salineville, O.
Sterling Mine, Drift, Strip vein, 36 in. thick.
PO—Salinville, O., SP—Same; CTY—Columbiana; RR—P. R. R., C. & P. Div.
S of H—5 Elec. loco.; track gauge 42 in.
S of M—12 Elec. mach.
PP—4 Return tubular boilers, total 550 H. P., 3 gen. units, 250 volts D. C.
EMP—250. Annual output 182,000 tons.

Delmore Mine, Slope, No. 3 Seam, 3½ ft. thick.
PO—Leetonia, O., SP—Same; CTY—Columbiana. RR—Erie.
MS—Daniel McGrath... Leetonia, O.
S of H—2 Elec. loco.; track gauge 39 in.
S of M—4 Elec. mach.
PP—2 Return tubular boilers, 300 H. P., 1 gen. unit 250 volts, D. C.
EMP—90. Last fiscal year output 65,000 tons.

STEUBENVILLE COAL & MINING CO., THE
"High Shaft" Mine, Shaft, No. 6 O. G. S. or Freeport Seam, 4 to 5 ft. thick.
PO—Steubenville, O., SP—Same, CTY—Jefferson.
PR—T. J. Sherrard....Wellsburg, W.Va.
TR—T. J. Sherrarrd, " "
GM—F. C. Chambers....Steubenville, O.
PA—F. C. Chambers, " "
MS—E. Jones, " "
S of H—2 Elec. loco., track gauge 28½ in.
S of M—4 Elec. mach.
PP—2 return tubular Union Iron Works boilers, total 250 H. P., 2 gen. units, 300 volts D. C.
EMP—75. 3 Bee Hive coke ovens. Last fiscal year output 40,000 tons.

STEWARTSVILLE MINING CO.
Now A. J. Morgan Coal Co.

STILLWATER COAL MINING CO.
General Office, Rockefeller Bldg., Cleveland, O.
Shaft Mine; No. 6 Up. Kittanning Seam, 44 to 70 in. thick.
PO—Tippecanoe, O.; SP—Same; CTY—Harrison; RR—C. L. & W., B. & O.
PR—M. M. Bauer...........Lake, O.
TR—H. P. Arnt,.........Cleveland, O.
GM—H. P. Arnt, " "
PA—L. H. Lanz, " "
GS—Pitt Townsend, " "
EM—Robert P. Millard, " "
MS—R. E. Roush......Tippecanoe, O.
EE—Andrew Rorald, " "
S of H—5 elec. locos. Track gauge 36 in.
S of M—7 elec. mach.
PP—1—500 K. W. and 1—100 K. W. 220 volts D. C., 1 pump. Buy power.
EMP—155. Output, 800 tons daily.

STORM-LOOMIS COAL CO., THE
General Office, Cleveland, O.
Kirk Mine, Drift, No. 7 Seam, 3 to 4 ft. thick.
PO—Salineville, O., SP—Same; CTY—Columbiana; RR—C. & P.
PR—F. C. Carroll......Cleveland, O.
TR—Fred Storm, " "
GM—D. P. Loomis......Canton, O.
GS—D. P. Loomis, " "
PA—D. P. Loomis, " "
MS—S. Leggett........Salineville, O.
CE—Geo. Arnold..New Philadelphia, O.
S of H—4 elec. loco. Track gauge 38 in.
S of M—5 Elec. mach.
EMP—100. Annual output 70,000 tons.

STRATTON FIRE CLAY CO. THE.
Ohio River Mine; Drift; No. 8 Seam; 42 to 51 in. thick.
PO—Empire, O. SP—Same; CTY—Jefferson; RR—C. & P.
PR—C. M. Stratton, ... Empire, O.
TR—C. M. Stratton, " "
PA—C. M. Stratton, " "
GM—Charles Vance, " "
MS—Charles Vance, " "
GS—W. W. McKee, " "
SCO—Stratton Bros., " "
S of H—Mules.
S of M—Hand.
PP—One pump.
EMP—20. Last fiscal year output, 13,578 tons.
Note—Output consumed in Clay plant.

SUGAR HILL COAL CO., THE
Sugar Hill Mine, Drift, Pittsburgh Seam No. 8, 5 ft. thick.
PO—Steubenville, O., CTY—Jefferson.
PR—Elmer H. King, Steubenville, O.
GM—Elmer H. King, " "
GS—Elmer H. King, " "
PA—Elmer H. King, " "
TR—Erma P. King, " "
S of H—Mules, track gauge 34 in.
S of M—Hand.
EMP—6. Annual output 3,383 tons.
Local mine.

SUN COAL MINING CO.
PO—Jackson, O. No report.

SUNDAY CREEK COAL CO.
General Office, Columbus, O.
PR—J. S. Jones..........Columbus, O.
TR—H. J. Reese, " "
GM—J. H. Winder, " "
PA—F. E. Falk, " "
EM—G. H. Dukes, " "
EE—O. S. Newton, " "
SM—G. E. Tetirick, " "
Sales Agent, P. A. Coen, Columbus, O.

Jobs Nos 2 Mine, Drift; No. 6 Seam, 36 to 84 in. thick.
PO—Jobs, O.; SP—Same; CTY—Hocking; RR—H. V.
MS—Harry Kelly.......Nelsonville, O.
S of H—Rope, mules and Elec. loco.; track gauge 42 in.
S of M—6 Elec. and Comp. air mach.
PP—2 Water tube and 3 return tubular boilers, gen. units 250 volts D. C., 1 air compressor and 3 pumps.
EMP—343.

No. 10 X. Mine; Slope; No. 6 Seam, 5½ ft. thick.
PO—Orbiston, O.; SP—Same, CTY—Hocking; RR—H. V.
S of H—Elec. loco. and rope.
S of M—Elec. mach.
EMP—228.

No. 10 Mine; Shaft; No. 6 Seam, 66 in. thick.
PO—Glouster, O.; SP—Same; CTY—Athens; RR—T. V. O. C.
S of H—3 Elec. loco. and mules; track gauge 36 in.
S of M—8 Elec. mach.
PP—3 Return tubular boilers, total 450 H. P., 3 gen. units 250 volts D. C., and 6 pumps.
EMP—228.

No. 9 Mine; Slope; No. 6 Seam, 60 in. thick.

PO—Carrington, O.; SP—Same; CTY—Perry; RR—Z. & W.
S of H—Elec. loco. and horses; track gauge 42 in.
S of M—6 Elec. mach.
PP—3 Return tubular boilers, total 450 H. P., 2 gen. units 250 volts D. C. and 3 pumps.
EMP—223.

Nos. 401 and 402 Mines; Shaft; No. 6 Seam, 40 in. thick.
PO—San Toy, O.; SP—Same; CTY—Perry; RR—B. & O., San Toy Br.
MS—E. E. Fillmore......San Toy, O.
S of H—13 Elec. loco.; track gauge 42 in.
S of M—22 Elec. mach.
PP—8 Boilers, total 1,200 H. P., gen. unit, 250 volts D. C., 6 pumps.
EMP—350.
Note—Mines Numbers 207, 209, 211, 254, 255, 256, 266, 267, 281, 301, 302, 268 taken over by Continental Coal Co.
Mines Numbers 201 and 275 taken over by New York Coal Co.

SUPERIOR COLLIERY CO.
Nos. 3, 4, 9, 10, 11, 12, 14 and 15 Mines; Shafts, slope, drift.
PO—Wellston, O. SP—Same. CTY—Jackson. RR—B. & O. and D. T. & I., and C. H. & D.
VP—U. S. Morris.......Detroit, Mich.
GM—U. S. Morris, " "
PA—A. J. Laverty........Wellston, O.
EM—Edward Kelly, " "
GS—A. J. Laverty, " "
SB—R. M. Brohard, " "
S of H—Elec. loco. and mules.
S of M—Hand and elec machines.
PP—Gen. units, D. C.
EMP—700.

SUPERIOR PORTLAND CEMENT CO.
Not operating coal mine.

THOMAS COAL CO
Thomas Mine, Shaft, No. 8 Seam, 4½ ft. thick.
PO—Racine, O.; SP—Pomeroy; CTY—Meigs; RR—O. R. E. & Power Co.
PR—D. Thomas...........Racine, O.
TR—D. Thomas, " O.
GS—D. Thomas, " "
GM—T. W. Lawson, " "
CE—J. B. Travowsky.......Pomeroy, O.
EE—James Mathewson.....Racine, O.
S of H—1 Elec. loco. and mules; track gauge 38½ in.
S of M—4 Elec. mach.
PP—2 boilers, total 120 H. P., 1 gen. unit, 250 volts D. C., 3 pumps.
EMP—55. Last fiscal year output 19,000 tons.
Sales Agent, J. W. Thomas, Racine, O.

THOMAS, D. H. COAL CO.
General Office, 319 Rockefeller Bldg., Cleveland, O.
Lucy Mine; Drift; Pittsburgh No. 8 Seam; 66 to 72 in. thick.
PO—Neffs, O.; SP—Same; CTY—Belmont; RR—B. & O.
PR—J. A. Paisley.......Cleveland, O.
TR—W. W. Woods, " "
GM—D. H. Thomas...St. Clairsville, O.
MS—D. H. Thomas, " "
GS—D. H. Thomas, " "
MM—B. M. Thomas.........Neffs, O.
EE—B. M. Thomas, " "
PA—R. L. Berry, " "
S of H—Mules and 1 elec. loco. Track gauge 42 in.
S of M—4 elec. mach.
PP—1 pump. Purchase power.
EMP—35.

TROLL COAL MINING CO.
Troll's Nos. 1, 2 and 4 Mines; Drifts; PittsburghNo. 8 Seam, 66 in. thick.
PO—Maynard, O.; SP—Trolls, O.;; CTY—Belmont; RR—W. & L. E., Adena Branch.
PR—C. W. Troll......St. Clairsville, O.
GM—C. W. Troll, " "
PA—Jesse S. Troll, " "
MS—Jesse S. Troll, " "
S of H—7 Elec. loco.; track gauge 42 in.
S of M—22 Elec. mach.
PP—6 Return tubular boilers, total 900 H. P., 2 gen. units 250 volts D. C.
EMP—642.

TROPIC MINING CO., (THE)
General Office, Toledo, O.
Tropic Mine, Slope, Hocking No. 6 Seam, 4½ ft. thick.
PO—Rose Farm, P. O., O., SP—Tropic, CTY—Morgan. RR—Z & W.
PR—Geo. M. Jones,.......Toledo, O.
TR—T. B. Earl, " "
PA—T. B. Earl, " "
MS—C. E. Spring..Rose Farm P.O.,O.
S of H—3 Elec. loco. Track gauge 36 in.
S of M—10 Elec. machines.
PP—4 return tubular boilers, total 600 H. P., 2 gen. units, 250 volts D. C., 4 pumps.
EMP—230. Last fiscal year output 200,000 tons. Sales Agents, The Geo. M. Jones Co., Toledo, Ohio.

TWIN-ADA COAL CO. (THE)
Twin-Ada Mine; Shaft; No. 2 Seam, 36 to 48 in. thick.
PO—Coalton, O.; SP—Glen Roy, O.; CTY—Jackson. RR—D. T. & I.
PR—Joseph McGhee.......Columbus, O.
TR—J. C. Rowe.........Coalton, O.
GM—Wm. J. Harper,......Wellston, O.
MS—Wm. J. Harper, " "
PA—Chas. E. McGhee......Jackson, O.
S of H—Mules and rope.
S of M—Hand.
PP—2 Return tubular boilers, total 250 H. P., 3 pumps.
EMP—60. Last fiscal year output 16,000 tons.

UNITED STATES COAL CO. (THE)
General Office, Cleveland, Ohio.
VP—M. A. Bradley.......Cleveland, O.
ASST TR—F. S. Deal, " "
GM—H. E. Willard, " "
PA—F. S. Deal, " "
SCO—The Bradley Supply Co., Bradley, O. Buyer, F. S. Deal, Cleveland, O.

Crow Hollow Mine, Drift, No. 8 Pittsburgh Seam, 5 ft. thick.
PO—Bradley, O. SP—Dillonvale, O. CTY—Jefferson. RR—W. & L. E. and L. S. & M. S. Ry.
S of H—Electric.
S of M—Electric.
PP—500 volts D. C.

Plum Run Mine, Drift, No. 8 Pittsburgh Seam, 5 ft. thick.
PO—Rhodesdale, O. SP—Rush Run, O. CTY—Jefferson. RR—Penna lines.
S of H—Electric.
S of M—Electric.
Sales agent, C. H. Bromley, Cleveland, Ohio.

UPSON COAL & MINING CO. (THE)
Dixie Mine, Drift, No. 6 Seam, 42 ins. thick.
PO—Dixie, O. SP—Same. CTY—Perry. RR—B. & O.
PR—W. F. Upson............Dixie, O.
PA—W. F. Upson, " "
TR—J. E. Upson.......Mansfield, O.
MS—J. M. Bell............Dixie, O.
EE—J. W. Bell, " "
SCO The Upson Coal & Mining Co. Buyer, S. M. Rutherford, Dixie, O.
S of H—5 elec. locomotives. Track gauge 42 ins.
S of M—6 elec. machines.
PP—2 Return tubular boilers, total 300 H. P., 2 gen. units 250 volts D. C., 4 pumps.
EMP—100. Last fiscal year output 69,160 tons.
Sales agent, The Balto. & Ohio Coal Co., Cleveland, O.

URBAN HILL COAL CO.
General Office, North Lawrence, O.
Urban Hill Mine; Slope; No. 1 Massillon Seam; 33 to 54 in. thick.
PO—No. Lawrence, O.; SP—Same; CTY—Stark; RR—Penna.
PR—J. H. Longworth, No. Lawrence, O.
MS—J. H. Longworth, " "
TR—Thomas Longworth, " "
GM—Wm. Longworth, " "
PA—Elmer Sheak, " "
S of H—Mules. Track gauge 39 in.
S of M—Hand.
PP—1 Erie City return tubular boiler, total 80 H. P., 1 hoisting eng., 1 pump.
EMP—23. Last fiscal year output 4000 tons.

VAN KIRK COAL & MINING CO.
Drift Mines; Nos. 5 and 6 Seam, 36 to 72 in. thick.
PO—Mineral City, O.; SP—Same; CTY—Tuscarawas; RR—B. & O.
PR—D. O. Van Kirk, Mineral City, O.
TR—D. O. Van Kirk, " " "
GM—D. O. Van Kirk, " " "
PA—D. O. Van Kirk, " " "
MS—J. J. Williams, " " "
S of H—Mules; track gauge 36 in.
S of M—Hand.
EMP—50. Last fiscal year output, 30,000 tons.

VALLEY CAMP COAL CO. (THE)
General Office, Cleveland, Ohio.
1 mine in Ohio, 1 mine in Penna.
Columbia Mine, Drift, Pgh No. 8 Seam, 5½ ft. thick.
PO—Fairpoint, O. SP—Same. Columbia Mine. CTY—Belmont. RR—B. & O., C. L. & W. Div.
PR—J. A. Paisley.......Cleveland, O.
TR—W. W. Woods, " "
GM—H. E. Kinloch......Parnasus, Pa.
PA—H. E. Kinloch.....Parnassus, Pa.
GS—H. E. Kinloch, " "
S of H—Elec. loco.
S of M—Elec.
PP—3 return tubular boilers, total 450 H. P., 2 gen. units, 250 volts D. C., 2 pumps.
EMP—225. Last fiscal year output 142,070 tons.
Sales agent, J. A. Paisly, Ceveland, O.

WARD COAL CO.
Eva Mine, Drift, No. 5 Seam.
PO—Oak Hill, O. SP—Same. CTY—Jackson. RR—B. & O.
GM—C. A. Bowman ....Oak Hill, O.
PA—C. A. Bowman, " "
MS—C. A. Bowman, " "
S of M—Mules..
S of M—Hand.
PP—Boiler, 12 H. P.
EMP—20. Last fiscal year output 16,000 tons.

WARWICK COAL CO.
Cleveland, O. No report.

WELLSTON COLLIERY CO. (THE)
Wellston Colliery Mine, Shaft, No. 5 Seam, 3 ft. thick.
PO—Wellston, O. SP—Same. CTY—Jackson. RR—C. H. & D.
PR—Jerry Morrow ....Wellston, O.
TR—F. C. Morrow, " "
GM—W. S. McCloud, " "
GS—W. S. McCloud, " "
PA—W. S. McCloud, " "
EM—Ed. Kelly, " "
MM—Harry Barr, " "
EE—Harry Barr, " "
S of H—Mules and 1 elec. motor Track gauge 36 in.
S of M—7 elec. machines.
PP—3 return tubular boilers, total 400 H. P., 2 gen. units, 250 volts D. C.
EMP—85. Annual output 65,000 tons.

WEST WHEELING COAL CO.
West Wheeling Mine, Drift, Pittsburgh Seam No. 8, 60 to 72 in. thick.
PO—Bridgeport, O. SP—Same. CTY—Belmont. RR—C. & P.
PR—Wm. G. Johnson...Bridgeport, O.
TR—T. H. Johnson, " "
GM—T. H. Johnson, " "
PA—T. H. Johnson, " "
MS—John Crook, " "
EM—Geo. Weiss, " "
EE—J. W. Pemberton, " "
S of H—Mules and 2 elec. loco. Track gauge 36 in.
S of M—6 elec. mining machines.
PP—500 volts D. C. (Power purchased.) 3 pumps.
EMP—150. Last fiscal year output 150,000 tons.
Sales agent, T. H. Johnson.

WHEAT HILL COAL CO.
Out of business.

WHEELER & MASON COAL COMPANY.
General office, 270 S. 3d St., Columbus, Ohio.
Saltillo Mine; Drift; No. 6 Seam; 46 to 48 in. thick.
PO—Saltillo, O.; SP—Same; CTY—Perry; RR—Z & W.
PR—W. E. Wheeler, ... Columbus, O.
PA—W. E. Wheeler, " "
TR—E. A. Wheeler, " "
GM—J. E. Mason, " "
GS—C. S. Wheeler, " "
MS—C. S. Wheeler, " "
EE—Denny Ault, " "
S of H—Mules and 1 elec. loco. Track gauge 36 in.
S of M 3 elec. machs.
PP—1 Water tube boiler, 1 gen. unit, 250 volts D. C., 1 pump.
EMP—65. Last fiscal year output, 20,000 tons.

WHEELING & LAKE ERIE COAL MNG. CO. (THE)
General Office, Leader News Building, Cleveland, Ohio.
Dillon No. 2 and 5, Herrick No. 4, Connor No. 3 Mines, Drifts, Pgh. No. 8 Seam, 5½ ft. thick.
PO—Dillonvale, O. SP—Same. CTY—Jefferson. RR—W. & L. E.
PR—D. R. Hanna ....Cleveland, O.
TR—C. H. Hanna, " "
GM—Michael Gallagher, " "
PA—T. F. Cadden, " "
S of H—39 elec. loco. and mules. Track gauge 36 in.
S of M—5 elec. mach.
PP—17 return tubular boilers.
EMP—1,200. Output for 3 months, 20,000 tons.

WHITACRE FIREPROOFING CO.
Drift Mine.
PO—Waynesburg, O. SP—Same. CTY—Stark. RR—P. R. R.
GM—J. J. Whitacre.....Waynesburg, O.
PA—R. E. Whitacre, " "
MS—Jos. Milner and Adam Burwell.
S of H—Elec. loco. and mules.
S of M—Hand.
PP—Gen. unit, 250 volts D. C.

WHITAKER-GLESSNER CO.
1 Mine in West Virginia, 1 Mine in Ohio
Laughlin Mine, Drift, Pittsburgh No. 8 Seam, 5 ft. thick.
PO—Martins Ferry, Ohio.,CTY—Belmont RR—B. & O. and P. R. R.
PR—Alex. Glass......Wheeling, W.Va.
TR—G. W. Hocking...Wheeling, W. Va.
GS—W. H. Kasley. " "
MM—Theo. Moore....Martins Ferry, O.
S of H—1 elec. loco. Track gauge 34 in.
S of M—1 elec. mach.
PP—Power furnished from Mill Plant.
EMP—30. Last fiscal year output 27,000 tons.

WILCOX COAL CO.
General Office, Akron, O.
Peacock Mine; Stripping; No. 5 Seam, 36 to 54 in. thick.
PO—Sandyville, O.; SP—Same; CTY—Tuscarawas; RR—B. & O.
GM—F. A. Wilcox..........Akron, O.
PA—F. A. Wilcox, " "
GS—C. G. Skelton ....Magnolia, O.
S of H—Steam eng.; track gauge 39 in.
EMP—15. Last fiscal year output 20,000 tons.

WIGTON, S. R.
GM—S. R. Winton........Roseville, O.
Wigton Mine, Drift, No. 6 Hocking Seam, 42 in. thick.
PO—Roseville, O., SP—Same, CTY—Muskingum. RR—(Wagon mine.)
MS—S. R. Wigton......Roseville, O.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
EMP—24. Last fiscal year output 1,000 tons.

Wigton and Robson Mines; Drifts; No. 6 Hocking Seam, 42 in. thick.
PO—McLuney, O.; SP—Same; CTY—Muskingum; RR—Penna.
MS—Geo. W. Robson......Roseville, O.
S of H—Mules; track gauge 32 in.
S of M—Hand.
EMP—12. Last fiscal year output 5,000 tons.

Interurban Mine; Drift; No. 6 Hocking Seam, 42 in. thick.
PO—Roseville, O.; SP—Same; CTY—Perry; RR—Southeastern Ohio.
MS—Geo. Robson..........Roseville, O.
S of H—Mules.

WILLIAMS, JOHN
Locust Grove Mine; Drift, No. 6 Seam, 36 to 60 in. thick.
PO—Coshocton, O.; SP—Same; CTY—Coshocton; RR—W. L. E.
PR—Thomas Williams....Coshocton, O.
GM—William Gilgannon, " "
S of H—Mules.
S of M—Hand.
PP—1 pump.
EMP—20. Last fiscal year output 70,000 tons.

WILLOW GROVE COAL CO.
Willow Grove Mine, Shaft, No. 1 Seam 24 to 48 in. thick.
PO—Massillon, O.; SP—Same; CTY—Stark.
TR—C. F. Smith, ...Massillon, O.
PA—C. F. Smith, " "
MS—C. F. Smith, " "
GM—C. F. Smith, " "
EM—Howard Yost, " "
MM—B. Pattinson, " "
S of H—Mules; track gauge 3 ft. 3 in.
S of M—Hand.
PP—2 Erie City return tubular boilers, total 135 H. P., 2 pumps.
EMP—9. Last fiscal year output 7,300 tons.

WITCH HAZEL COAL CO.
General Office, Youngstown, O.
Florence No. 3 Mine; Stripping; Pgh. No. 8 Seam, 5 ft. thick.
PO—Parlett, O.; SP—Piney Fork; CTY—Jefferson; RR—L. S. & M. S., Alliance Div.
PR—W. J. Sampson.....Youngstown, O.
TR—Chas. Westlake, " "
PA—W. J. Sampson, " "
GS—Geo. Evans...........Parlett, O.
S of H—1 steam loco. Track gauge 42 in.
S of M—2 steam shovels.

WOLFORD, M. S.
Plain View Mine; Drift; No. 6 Seam, 48 in. thick.
PO—Coshocton, O., SP—Same, CTY—Coshocton. RR—W. & L.E.R.R.
PR—M. S. Wolford....Coshocton, O.
GS—M. S. Wolford, " "
PA—M. S. Wolford, " "
TR—Edgar Wolford, " "
GM—John I. Wolford, " "
EM—Edgar Nash, " "
S of H—Mules; track gauge 31 in.
S of M—Hand.
EMP—12. Last fiscal year output 6,000 tons.
Sales Agent, M. S. Wolford.

WOLF RUN COAL CO.
General Office, 811 Leader Bldg., Cleveland, O.
Elizabeth Mine, Shaft, No. 6 Seam, 3½ to 5 3-4 ft. thick.
PO—Wolf Run, O., SP—Bergholz, O., CTY—Jefferson; RR—N. Y. C., Alliance Div.
PR—W. H. Warner.....Cleveland, O.
TR—Whitney Warner, " "
PA—K. B. Whitworth, " "
CE—E. L. Thrower, " "
MS—Joseph Baker, ...Wolf Run, O.
SCO—McCracken Supply Co., Pgh., Pa.

(Continued on Next Page.)

Wolf Run Coal Co.—Cont.
S of H—9 Elec. loco.; track gauge 42 in.
S of M—11 Elec. machines.
PP—4 Erie City return tubular boilers, total 700 H. P., 3 gen. units 250 volts D. C., 2 pumps.
EMP—300. Last fiscal year output 258,616 tons. Sales Agent, W. H. Warner Co., Cleveland, O.

WRIGHT & ZEHNER CO. (THE)
General Office, 509 Commercial Bank Bldg. Cleveland. Ohio
X L Mine; Slope; 6½ A Seam, 32 to 40 in. thick.
PO—Bergholz, O. SP—Same. CTY—Jefferson; R. R.—N. Y. C., L. E. A. and W. branch.
PR—J. J. Barlum........Detroit, Mich
TR—H. C. Hutchinson....Cleveland, O.
GM—S. H. Needs, " "
GS—S. H. Needs, " "
CE—R. P. Millard........Bergholz, O.
MM—Wm. Kinney.......Bergholz, O.
MS—C. C. McKeever, " "
EE—Wm. Kinney, " "
S of H—11 Elec. loco., track gauge 36 in.
S of M—12 Elec. chain machines.
PP—4 Return tubular boilers, total 550 H. P., 3 gen. units 325 volts D C., 2 Pumps.
EMP—150. Last fiscal year output 121,000 tons.

YORK CLAY & MINING CO., (THE)
General Office, Nelsonville, Ohio.
PR—J. P. Cummiskey..Detroit, Mich.
TR—W. H. Bennett....Nelsonville, O.
GM—W. H. Bennett, " "
PA—W. H. Bennett, " "
GS—B. E. Walburn......Nelsonville, O.
EE—Wm. McConnell.......Buchtel, O.

Half Moon No. 2, Drift, No. 6 Seam, 5 to 6 ft. thick.
PO—Buchtel, O., SP—Same, CTY—Athens; RR—Hocking Valley.
S of H—Horses and 2 elec. loco., track gauge 42 in.
S of M—4 Elec. machines.
PP—1 Erie boiler, 150 H. P., 1 gen. unit 250 volts D. C., 2 Pumps.
EMP—103. Last fiscal year output 81,000 tons.

Rainbow Block No. 1, Drift, No. 7 Seam, 5 to 5½ ft. thick.
PO—Buchtel, O., SP—Same, CTY—Athens; RR—Hocking Valley.
S of H—Horses and 1 Elec. loco; track gauge 42 in.
S of M—2 Elec. machines.
PP—Power furnished from plant at Half Moon No. 2.
EMP—36. Last fiscal year output 70,000 tons.

YOUGHIOGHENY & OHIO COAL CO. (THE)
General Office, Cleveland, O.
7 Mines in Ohio, 6 Mines in Penna.
PR—S. H. Robbins.....Cleveland, O.
TR—W. L. Robinson, " "
Chairman—J. G. Patterson, Pgh., Pa.
GS—A. W. Osborne......Cleveland, O.
GS—Asst. A. G. Squibb....Barton, O.
PA—S. L. Thompson....Cleveland, O.
CE—John Rees........Pittsburgh, Pa.
EM—W. A. Thomas, " "
MM—W. A. Williams......Barton, O.
EE—W. H. Williams, " "
SCO—Y. & O. Coal Co., buyer, O. P. Parkin, Pittsburgh, Pa.
Sales Agent, H. L. Findley, Cleveland, O.

Barton, Maple Hill and Boggs Mines; Drifts; Pgh. No. 8 Seam; 5½ ft. thick.
PO—Barton, O.; SP—Same; CTY—Belmont. RR—B. & O., C. L. & W. Div
MS—(B) Wm. Findlay. (MH) Sharpe. Hathaway, (B) P. J. Leonard, Barton, O.
SM—R. L. Creswell........Barton, O.
S of H—Elec. and mules; track gauge 44 in.
S of M—Elec.
PP—7 boilers, total 1,050 H. P., 500 and 250 volts D. C.
EMP—750.

Florence Mine; Drift; Pgh. No. 8 Seam, 5½ ft. thick.
PO—Martins Ferry, O.; SP—Same; CTY—Belmont; RR—P. R. R., C. & P. Div.
MS—Lee Rankin....Martins Ferry, O.
SM—E. H. Cope, " "
S of H—Elec.; track gauge 44 in.
S of M—Elec.
PP—2 Boilers, total 300 H. P., 500 volts D. C.
EMP—300.

Amsterdam Mine, Shaft; No. 6 Seam, 4½ ft. thick.
PO—Amsterdam, O.; SP—Same—Jefferson; RR—L. E. A. & W.
MS—Richard Jones,.....Amsterdam, O.
SM—Joshua Kirkland, " "
S of H—Elec.; track gauge 44 in.
S of M—Elec. and mules.
PP—4 Boilers, total 450 H. P., 250 volts D. C.
EMP—200.

Delora Mine; Shaft; Pgh. No. 8 Seam; 5½ ft. thick.
PO—Glencoe, O.; SP—Same; CTY—Belmont; RR—B. & O., Newark Div.
MS—Edward Lee.........Glencoe, O.
SM—L. Johnson, " "
S of H—Elec. and mules; track gauge 44 in.
S of M—Elec.
PP—6 Boilers, total 600 H. P., 250 volts D. C.
Eleanor Mine; Shaft; Pgh. No. 8 Seam; 5½ ft. thick.
PO—Warnock, O.; SP—Same; CTY—Belmont. RR—B. & O., Newark Div
MS—J. L. Robson.......Warnock, O.
SM—Geo. C. Jeffries, " "
S of H—Elec.; track gauge 44 in.
S of M—Elec. and hand.
PP—3 Boilers, total 450 H. P.

ZANESVILLE COAL CO. (THE)
General Office. Zanesville, Ohio.
PR—W. L. Timmons ....Zanesville, O.
GM—W. L. Timmons, " "
GM—Asst. J. E. Trainer, " "
GS—Thos. Opie ....Crooksville, O.
PA—C. W. Joslin......Zanesville, O.
EM—T. C. Connor, " "

Keystone No. 1, Drift, Middle Kittanning Seam, 42 to 50 in. thick.
PO—Crooksville, O., SP—Same, CTY—Perry. RR—Penna. C. A. & C., Zanesville Div.
MS—Geo. Jones.........Crooksville, O.
S of H—Mules, 4 elec. loco. Track gauge 36 in.
S of M—9 elec. machines.
PP—2 gen. units 250 volts A. C., 3 phase, 60 cycle. Power purchased.
EMP—150.

Keystone No. 3, Drift, No. 6 Low vein, 42 in. thick.
PO—Crooksville, O., SP—Same, CTY—Perry; RR—Penna., C. A. & C., Zanesville Div.
MS—Thos. Evans..........Roseville, O.
S of H—Mules and 1 elec. loco. Track gauge 36 in.
S of M—4 elec. machines.
EMP—75. Power from No. 1 Mine.

Keystone No. 4 Mine. Dismantled.

Keystone No. 5, Drift, No. 6 Low Vein, 42 in. thick.
PO—Saltillo, O., SP—Same, CTY—Perry. RR—N. Y. C. & Z. & W.
MS—Edward Moore.......Saltillo, O.
S of H—Mules and 1 Elec. loco.; track gauge 36 in.
S of M—Hand and 5 Elec. mach.
PP—1 gen. unit 250 volts A. C., 3 phase, 60 cycle. Power purchased.
EMP—100.

OKLAHOMA

For List of Abbreviations See Page 622.

ALKO-NAK COAL MINING CO.
Henryetta, Okla. No report.

ARKO COAL CO.
See Poteau Coal Co.

BACHE-DENMAN COAL CO.
PO—Red Oak, Okla. No report.

BLUE RIDGE COAL CO.
General Office, 1115 Colcord Bldg., Oklahoma City, Okla.
PR—D. J. Jorden, Oklahoma City, Okla.
TR—D. J. Jorden, " " "
GM—D. J. Jorden, " " "
PA—D. J. Jorden, " " "
GS—E. W. Hogan....McCurtain, Okla.
MM—W. H. James, " "
CE—H. O. Lewis.....Fort Smith, Ark.
EM—H. O. Lewis, " "

No. 3 Mine; Slope; Panama Seam 46 to 84 in. thick.
PO—McCurtain, Okla.; SP—Same; CTY—Haskell; RR—F. S. & W.
MS—Frank Kababka—McCurtain, Okla.
S of H—1 elec. loco. and mules. Track gauge, 42 in.
S of M—5 Elec. mach.
PP—4 Erie City Iron Works return tubular boilers, total 300 H. P., 2 gen. units, 500 volts A. C., 1 pump. (Central power plant.)
EMP—144. Output for 8 months 42,751 tons. 210 Bee Hive Coke Ovens.

No. 4 Mine; Slope; Panama Seam; 46 to 84 in. thick.
PO—McCurtain, Okla.; SP—Same; CTY—Haskell; RR—F. S. & W.
S of H—Elec. loco.
S of M—2 elec. mach.
Note—Just commencing development.

No. 5 Mine; Slope; Panama Seam; 46 to 84 ins. thick.
PO—McCurtain, Okla.; SP—Same; CTY—Haskell, RR—F. S. & W.
S of H—Elec. loco.
S of M—Elec. mach.
Note—Just commencing development.

BLACKSTONE COLLIERIES, INC.
See Okmulgee Coal Co.

BOKOSHE-SMOKELESS COAL CO.
Nos. 1, 3 and 5 Mines; Slope; Panama Seam, 48 to 72 in. thick.
PO—Bokoshe, Okla.; SP—Same; CTY—Leflore; RR—M. V.
PR—A. P. Gunther......Bokoshe, Okla.
TR—Frank Gunther, " "
GM—Joseph Oliver, " "
GS—Joseph Oliver, " "
EM—H. O. Lewis, " "
MM—John Robertson, " "
MS—James Bell, " "
S of H—Mules.
S of M—Hand.
PP—5 Boilers, total 500 H. P., 5 pumps.
EMP—150. Last fiscal year output, 54,000 tons.
Sales Agency, McAlester Fuel Co., McAlester, Okla.

BOLEN-DARNALL COAL CO.
In hands of receiver.

CANADIAN COAL CO.
General Office, Tulsa, Okla.
Dawson Mine; Slope; Seam 32 in. thick.
PO—Dawson, Okla.; SP—Same; CTY—Tulsa. RR—St. L. & S. F.
PR—J. R. Cole, Jr.......Tulsa, Olka.
TR—C. C. Cole, " "
MS—Fred Calvert...R.F.D., Tusla, Okla.
SM—O. A. Cunningham, " "
S of H—Mules and rope.
S of M—Hand.
PP—2 Boilers, total 50 H. P., 1 pump.
EMP—75. Last fiscal year output 30,000 tons.

CAPITOL COAL & MINING CO.
Mine abandoned.

CARBON COAL CO.
Nos. 1, 2 and 3 Mines; Slopes, McAlester Seam.
PO—Carbon, Okla.; SP—Same; CTY—Pittsburgh; RR—M. K. & T., Wilburton Br.
PR—P. G. Pierce........Carbon, Okla.
GM—P. G. Pierce, " "
TR—E. P. Joyner, " "
PA—E. P. Joyner, " "
MS—P. G. Pierce, " "
MM—Clyde Hale, " "
S of H—Mules.
S of M—Hand.
PP—1 compressor, 440 volts A. C., 3 phase, 60 cycles.
Sales Agency, McAkester Fuel Co., McAlester, Okla.

CENTRAL COAL & COKE CO.
General Office, Kansas City, Mo.
2 Mines in Oklahoma, 3 in Missouri, 3 in Wyoming, 7 Arkansas, 9 in Kansas.
Nos. 8 and 9 Mines; Slopes; 48 to 54 in. thick.
PO—Calhoun, Okla.; SP—Calhoun Via. Shady Point; CTY—LeFlore; RR—K. C. S., Poteau Valley Br.
PR—Charles S. Keith, Kansas City, Mo.
VP—Harry N. Taylor......Chicago, Ill.
TR—E. E. Riley.....Kansas City, Mo.
GS—Wm. Hark[illegible]s, " "
EM—T. O'Flaherty, " "
PA—Thos. Mackie....Kansas City, Mo.
SM—Thos. Mackie, " "
MS—S. D. Graham.....Calhoun, Okla.
S of H—Rope, gravity and steam loco.
S of M—14 elec. mach.
PP—3 water tube boilers, total 700 H. P., gen. unit, 2300 volts A. C., 3 phase, 60 cycles.

CHOCTAW COAL & COKE CO.
General Office, Fort Smith, Ark.
No. 2 Mine; Slope; Panama Seam.
PO—Bokoshe, Okla. SP—Same. CTY—LeFlore; RR—Midland Valley.
GM—F. Bentelschies....Bokoshe, Okla.
PA—F. Bentelschies, " "
SM—F. Bentelschies, " "
MS—Chas. Smith, " "
S of H—Mules and rope.
S of M—Hand.
PP—Boiler 100 H. P.
EMP—35.

COALGATE CO. (THE)
No. 5 Mine, Shaft, Lehigh Seam, 4 ft. 4 in. to 5 ft. thick.
PO—Coalgate, Okla. SP—Same. CTY—Coal. RR—M. K. & T.
PR—Wm. H. Yale....New York, N. Y.
TR—S. T. Kerr....Philadelphia, Pa.
GM—S. W. W. Pomeroy.Coalgate, Okla.
PA—S.W.W. Pomeroy, Coalgate, Okla.
MS—R. H. Brown, " "
SM—O. D. Lickleder.....Coalgate, Okla.
MM—John Creber, " "
S of H—Mules, rope, gravity and 2 elec. loco. Track gauge 30 in.
S of M—Hand.
PP—6 J. O'Brien return tubular boilers, total 480 H. P., 2 gen. units, 250 volts D. C.
EMP—290. Last fiscal year output 128,440 tons.
Sales agent, Southern Fuel Co., Dallas, Texas.

CREEK COAL & MNG. CO. (THE)
Mine No. 1. Shaft, Henryetta Seam. 2 ft. 8 in. to 3 ft. 1 in. thick.
PO—Henryetta, Okla. SP—Same. CTY—Okmulgee. RR—St. L. & S. F.
PR—James Cameron....Henryetta, Okla.
GM—James Cameron, " "
PA—James Cameron, " "
TR—Joe Hillman, "
MS—Joe Johnson, " "
SM—J. B. Rily, " "
EM—M. J. Smith....McAlester, Okla.
MM—Wm. Kerr ......Henryetta, Okla.
EE—M. D. Godar.
S of H—Mules and 1 gasoline locomotive. Track gauge 42 in.
S of M—11 elec. mach. and hand.
PP—4 return tubular boilers, 1 John O'Brien, 1 Atlas, 2 Casey Hedges, 2 gen. units, 250 volts D. C., 1 pump.
EMP—233. Last fiscal year output 102,930 tons.
Sales agent, Roy W. Short, Henryetta, Okla.

DAVISON BROTHERS COAL CO.
Shaft Mine; Coalgate Seam; 60 in. thick;
PO—Coalgate, Okla.; SP—Phillips, Okla. CTY—Coal; RR—M. K. & T.
PR—J. R. Davison......Coalgate, Okla.
GM—J. R. Davison " "
TR—B. P. Davison " "
PA—B. P. Davison " "
S of H—Mules and rope
S of M—Hand.
PP—1 elec. pump. Power purchased.
EMP—60. Output daily, 200 tons.

DEEP FORK COAL MINING CO.
PO—Coalton, Okla.; CTY—Okmulgee.
No report.

DEGNAN-McCONNELL COAL & COKE CO.
PO—Wilburton and Howe, Okla.; CTY—Latimer and LeFlore.
No report.

DOW COAL CO.
General Office, McAlester, Okla.
Savanna Mine, Slope, McAlester Seam,
PO—Savanna, Okla. SP—Same. CTY—Pittsburg. RR—M. K. & T.
GM—W. E. Beatty ...McAlester, Okla.
PA—W. E. Beatty, " "
EM—B. E. Clark ....Dow, Okla.
MS—Wm. Jones ....Savanna, Okla.
MS—Roy Bridgewater, " "
SM—J. M. Stewart, " "
S of H—Rope and mules.
S of M—Elec. mach. and hand.
PP—5 boilers, total 500 H. P.
(Old information.)

ECLIPSE COAL & MNG. CO.
General Office, Wilburton, Okla.
Eclipse Mine No. 1, Slope, Wilburton Seam, 4 to 5 ft. thick.
PO—Adamson, Okla. **SP**—Same. **CTY**—Pittsburg. **RR**—M. K. & T., Wilburton Branch. —
PR—H. L. Dalby .. Wilburton, Okla.
GM—H. L. Dalby, " "
TR—Robt. Livingston, " "
CE—John R. Dalby, " "
EM—John R. Livingston, Wilburton, Okla.
PA—John Robinson ....Adamson, Okla.
MS—John Robinson, " "
MM—John Robinson, " "
S of H—Mules and steam. Track gauge 36 in.
S of M—Hand.
PP—2 return tubular boilers, total 100 H. P.
EMP—40. Last fiscal year output 12,000 tons.
Sales agent, The McAlester Fuel Co.

FOLSOM MORRIS COAL MINING CO. (The)
General Office, Lehigh, Okla.
PR—Dorset Carter,
Colcord Bldg., Oklahoma City, Okla.
TR—W H. Sparger......Lehigh, Okla.
GM—D. C. McAlpine, " "
GS—D. C. McAlpine, " "
PA—D. C. McAlpine, " "
MM—John Baxendale, " "
SM—E. S. Goodson, " "
EM—Ivor Gough..........Lehigh Okla.
Sales Agent, B. M. Haile, Colcord Bldg., Oklahoma City, Okla.

No. 1 Mine; Shaft; McAlester Seam, 36 to 56 in. thick.
PO—Lehigh, Okla.; **SP**—Same; **CTY**—Coal; **RR**—M. K. & T,
MS—Alex Oglivie........Lehigh, Okla.
S of H—Mules.
S of M—1 Sullivan elec. mach.
PP—2 O'Brien return tubular boilers, total 200 H. P.
EMP—120. Last fiscal year output 55,609 tons.

No. 5 Mine; Shaft; McAlester Seam, 48 to 54 in. thick.
PO—Lehigh, Okla.; **SP**—Same; **CTY**—Coal; **RR**—M. K. & T., Santa Fe, C. R. I. & P.
MS—James Miller........Lehigh, Okla.
S of H—Mules and rope.
S of M—Hand.
PP—5 O'Brien return tubular boilers, total 500 H. P., 1 pump.
EMP—350. Last fiscal year output 138,659 tons.

No. 6 Mine; Shaft; McAlester Seam, 48 to 56 in. thick.
PO—Phillips, Okla.; **SP**—Same; **CTY**—Coal; **RR**—M. K. & T., Santa Fe, C. R. I. & P.
MS—Wm. Patterson......Lehigh, Okla.
S of H—1 Elec. loco.; track gauge, 30 in.
S of M—Hand ....
PP—5 O'Brien return tubular boilers, total 550 H. P., 1 gen. unit, 250 volts D. C.
EMP—350. L ast fiscal year output, 121,060 tons.

No. 8 Mine; Shaft; McAlester Seam, 36 to 40 in. thick.
PO—Lehigh, Okla.; **SP**—Same; **CTY**—Coal; **RR**—M. K. & T.; Santa Fe, C. R. I. & P.
MS—Henry Pax.........Lehigh, Okla.
S of H—1 Elec. loco., rope and mules; track gauge, 30 in.
S of M—Hand.
PP—5 O'Brien return tubular boilers, total 500 H. P., gen. unit, 500 volts D. C.
EMP—350. Last fiscal year output, 146,645 tons.

FURSMAN COAL CO
Fursman Mine; Drift; Seam, 32 to 39 in. thick.
PO—Schulter, Okla.; **SP**—Same; **CTY**—Okmulgee; **RR**—M. O. & G.
PR—W. H. Fursman, Schulter, Okla.
GM—W. H. Fursman, " "
PA—W. H. Fursman, " "
MS—W. H. Fursman, " "
TR—Winifred Fursman, " "
S of H—Mules and gravity; track gauge, 42 in.
EMP—10.
Output at present, 60 tons per day. Capacity when developed, 500 tons per day.

GAINES CREEK COAL & MINING CO.
PO—Adamson, Okla.; **CTY**—Pittsburg.
No report.

GREAT WESTERN COAL & COKE CO.
General Office, McAlester, Okla.
Receiver, T. W. Wheatley, McAlester, Okla.
Nos. 2 and 3 Mines; Slope; Hartshorne Seam, 45 to 54 in. thick.
PO—Wilburton, Okla.; **SP**—Same; **CTY**—Latimer; **RR**—C. R. I. & P.
MS—J. B. Wilson....Wilburton, Okla.
EM—H. Shaw, " "
MM—H. Trussley, " "
S of H—Mules and rope.
S of M—Hand.
PP—3 return tubular boilers, total 200 H. P., 2 air comp., 1 pump.

GREEN RIDGE COAL CO.
Green Ridge Mine; Slope; Henryetta-Dewar Seam; 36 in. thick.
PO—Dewar, Okla.; **SP**—Same; **CTY**—Okmulgee; **RR**—M. O. G.
PR—D. Hall............Dewar, Okla.
TR—R. L. Caruthers, " "
MS—D. Hall, " "
CE—C. E. Schurch....Henryetta, Okla.
S of H—Mules and rope.
S of M—2 elec. mach.
PP—2 water tube boilers, 160 H. P., 4 gen. units, 440 volts A. C., 3 phase; 60 cycles, 1 pump.
EMP—60. Output, 300 tons per day.
Sales Agent, J. W. Hinton, Henryetta.

HAILEY-OLA COAL CO.
Haileyville, Okla.
PR—D. M. Hailey.....McAlester, Okla.
TR—D. M. Hailey, " "
GM—J. R. Sharp.....Haileyville, Okla.
PA—J. R. Sharp, " "
CE—T. W. McLaughlin, McAlester, Okla.
EM—T. W. McLaughlin, " "
MM—M. H. McGlasson, Haileyville, Okla.
EE—M. H. McGlasson, " "
SCO—Hailey-Ola Coal Co. Store. Buyer, J. C. Woodrow, Lutie, Okla.

Hailey-Ola No. 1, Slope and Shaft, Hartshorne Seam, 60 to 66 in thick.
PO—Haileyville, Okla.; **SP**—Same; **CTY**—Pittsburg; **RR**—C. R. I. & P.
MS—A. Nichols......Haileyville, Okla.
S of H—Rope and Mules. Track gauge 36 in.
S of M—16 comp. air mach.
PP—4 return tubular boilers, total 550 H. P.(2 pumps, 2 air compressors.

Hailey-Ola No. 6; Slope; McAlester Seam; 36 to 44 in. thick.
PO—Haileyville, Okla.; **SP**—Same; **CTY**—Pittsburg; **RR**—C. R. I. & P.
MS—A. Nichols......Haileyville, Okla.
S of H—Mules and rope.
S of M—8 comp. air machs.
PP—4 return tubular boilers, total 400 H. P., 1 pump, 1 air compressor.
EMP—50.

Hailey-Ola No. 4 Mine; Slope; Hartshorne Seam; 56 to 66 in. thick.
PO—Lutie, Okla.; **SP**—Wilburton; **CTY**—Latimer; **RR**—C. R. I. P.
MS—T. McAlpine.........Lutie, Okla.
SM—J. C. Woodrow, " "
S of H—Mules and rope.
S of M—2 comp. air mach.
PP—4 return tubular boilers, total 400 H. P., 1 pump, 1 air comp.

Lutie No. 5; Slope; Hartshorne Seam; 66 to 68 in. thick.
PO—Lutie, Okla.; **SP**—Wilburton; **CTY**—Latimer; **RR**—C. R. I. & P.
MS—T. McAlpine.........Lutie, Okla.
SM—J. C. Woodrow, " "
S of H—Mules and rope.
S of M—2 comp. air mach.
PP—2 return tubular boilers, total 300 H. P., 1 pump, 1 air comp.
EMP—25.

HAZELTON COAL CO. (THE)
No. 1 Mine, Slope, Lehigh-McAlester Seam; 46 to 48 in. thick.
PO—Coalgate, Okla., **SP**—Chase, Okla.; **CTY**—Coal; **RR**—A. T. & S. F., O. C. Div.
PR—James McGinnis, Coalgate, Okla.
TR—H. A. Everest, " "
GM—H. A. Everest, " "
PA—H. A. Everest, " "
MS—H. A. Everest.....Coalgate, Okla.
EM—A. W. Schneider, " "
MM—John Hunt, " "
EE—Ira Ingram, " "
SM—B. A. File........Coalgate, Okla.
S of H—Mules, rope, gravity and 2 elec. locos. Track gauge 36 in.
S of M—3 elec. machines.
PP—2 locomotive boilers, 160 H. P., 3 engines, 220 volts A. C., 3 phase, 60 cycles, 2 pumps, and purchase power.
EMP—75. Last fiscal year output 15,000 tons.
Sales Agency, McAlester Fuel Co.

HERRON COAL MINING COMPANY
Herron No. 1 Mine, Slope, Henryetta Seam, 36 in. thick.
PO—Coalton, Okla.; **SP**—Same; **CTY**—Okmulgee; **RR**—M. O. & G.
PR—W. F. Herron......Coalton, Okla.
TR—W. F. Herron, " "
GM—W. F. Herron, " "
MS—W. F. Herron, " "
SM—W. F. Herron, " "
PA—Fidelity Fuel Co., ..Coalton, Okla.
EM—Wm. Thompson, " "
MM—Robt. Milliard, " "
EE—Robt. Milliard, " "
CE—William Eadie, " "
S of H—Mules. Track gauge 42 in.
S of M—Hand and 2 elec. mach.
PP—1 gen. unit; 3 phase and 60 cycle, 440 volts A. C. Purchase power.
EMP—40. Last fiscal year output 185,000 tons. Sales agency, Fidelity Fuel Co.

HICKAY COAL & MINING CO.
HicKay Mine; 32 in. thick.
PO—Tulsa, Okla.; **SP**—Rudd; **CTY**—Tulsa; **RR**—M. K. T.
PR—Ellis Short..........Tulsa, Okla.
TR—E. D. Baily, " "
GM—Peter Adamson, Jr., " "
GS—Peter Adamson, Jr. " "
CE—M. J. Smith, " "
EM—Daniel Williams, " "
MM—Arthur Creek, " "
SM—Elgie Yonnans, " "
S of M—2 elec. mach.
PP—2 return tubular boilers, total 220 H. P.

HICKORY COAL & MINING CO.
See Hickay Coal & Mining Co.

HOME SMOKELESS COAL CO.
PO—Bokoshe, Okla.; **CTY**—LeFlore.
No report.

KALI-INLA COAL CO.
General Office, Fort Smith, Ark.
Kali-Inla No. 1, Slope and Shaft, Lower Hartshorne Seam.
PO—Dwight, Okla. **SP**—Hartshorne, Okla. **CTY**—Latimer. **RR**—C. R. I. & P.
PR—J. T. Jackson....Philadelphia, Pa.
VP—C. H. Finley, ...Fort Smith, Ark.
TR—C. H. Finley, " "
GS—W. A. Evans....Hartshorne, Okla.
MS—John Patterson .... Dwight, Okla.
S of H—Rope and mules.
S of M—8 elec. machines.
PP—Purchase power.

KEYSTONE COAL MINING CO.
Keystone Mine; Slope; McAlester Seam, 4 to 5 ft. thick.
PO—Coalgate, Okla.; **SP**—Chase; **CTY**—Coal; **RR**—Santa Fe,, Lehigh br.
PR—E. P. Williamson, Coalgate, Okla.
GM—E. P. Williamson, " "
GS—E. P. Williamson, " "
PA—E. P. Williamson, " "
TR—Victor Bey, " "
MM—Wm. Lane.......Coalgate, Okla.
EM—T. W. McLaughlin, McAlester, "
SCO—J. Bogy & Co. Buyer, Victor Bey, Coalgate, Okla.
S of H—Rope and mules.
S of M—Hand.
PP—2 Brownlee return tubular boilers, total 160 H. P.
EMP—15.

KEYSTONE COAL & MINING CO.
Nos. 4 and 5 Mines; Slope and Stripping; McAlester Seam, 48 to 72 in. thick.
PO—Coalgate, Okla.; **SP**—Same; **CTY**—Coal; **RR**—C. R. I. & P., Ardmore Branch.
PR—E. P. Williamson....Coalgate, Okla.
GM—E. P. Williamson, " "
PA—E. P. Williamson, " "
MS—E. P. Williamson, " "
TR—Wm. Lane, " "
EM—T. L. McLaughlin, Haileyville, Okla.
S of H—Mules and rope; track gauge 36 in.
S of M—Hand.
PP—2 Return tubular boilers, total 240 H. P., 2 gen. units, 1 pump.
EMP—40. Last fiscal year output 27,000 tons.
Sales Agency, McAlester Fuel Co., McAlester, Okla.
Formerly Lane & Williamson Coal Co.

KING COAL CO.
PO—Dewar, Okla.; **CTY**—Okmulgee.
No report.

LE BOSQUET COAL & MNG. CO.
PO—Hughes, Okla. No report.

McALESTER COAL & COKE CO.
General Office, Buck (via Carbon) Okla.
GM—P. R. Allen ....McAlester, Okla.
TR—C. E. Chapman...McAlester, Okla.
GS—D. D. Dunkin.....Alderson, Okla.
PA—D. D. Dunkin " "
SM—Geo. M. Abbott,
Buck (via Carbon) Okla.

Buck No. 6 Mine, Shaft, "Lower Hartshorne" Seam, 3 ft. 4 in. to ft. 6 in. thick.
PO—Alderson, Okla.; **SP**—McAlester, Okla.; **CTY**—Pittsburg; **RR**—M. K. & T.
MS—D. D. Dunkin ....Alderson, Okla.
S of H—Mules, rope and 1 gasoline loco. Track gauge 3 ft.
S of M—Hand and 8 comp. air mach.
PP—8 return tubular boilers, total 800 H. P., 1 air comp., 2 pumps.
EMP—225. Last fiscal year output 80,000 tons.

Buck No. 21 Mine, Slope, "Lower Hartshorne" Seam, 3 to 5 ft. thick.
PO—Buck, Okla. **SP**—Alderson, Okla. **CTY**—Pittsburg. **RR**—C. R. I. & P., M. K. & T.
MS—D. D. Dunkin......Alderson, Okla.
S of H—Mules and rope. Track gauge 3 ft.
S of M—Hand.
PP—2 return tubular boilers, total 160 H. P., 2 pumps.
EMP—45. Last fiscal year output 38,000 tons.

McALESTER-CHOCTAW COAL CO.
Redman and Jeannette Mines.
PO—McAlester, Okla. **CTY**—Pittsburg.
No report.

McALESTER-EDWARDS COAL CO.
Nos. 1 and 2 Mines, Slopes. McAlester Seam, 48 to 60 in. thick. Operate washery.
PO—Pittsburg, Okla. **SP**—Same. **CTY**—Pittsburg. **RR**—M. K. & T., C. R. I. & P.
GM—F. B. Drew .....Pittsburg, Okla.
PA—F. B. Drew. " "
MS—A. B. Cameron, " "
S of H—Mules.
S of M—Hand.
PP—5 boilers.
EMP—220.

McALESTER & GALVESTON COAL MNG. CO.
Galveston No. 3, Slope, Lower Hartshorne Seam, 2 ft. 8 in. to 3½ ft. thick.
PO—North McAlester, Okla. **SP**—Same. **CTY**—Pittsburg. **RR**—M. K. & T., Main Line.
Lessee—W. P. Mullen..McAlester, Okla.
MS—W. P. Mullen, " "
S of H—Mules. Track gauge 3 ft.
S of M—Hand.
PP—1 Walsh & Weidner boiler, total 70 H. P., 1 pump.
EMP—30. Last fiscal year output 9,626 tons. Idle since September, 1914.
Mine not being worked.

MILBY & DOW COAL & MINING CO.
General Office, Dow, Okla.
PR—R. C. Storrie, San Francisco, Cal.
TR—H. C. Rice..........Dow, Okla.
GM—H. C. Rice, " "
PA—H. C. Rice, " "
GS—John Paterson, " "
EE—W. M. Schureman, " "
SM—E. R. Long, " "
EM—Geo. M. Brown...McAlester, "
MM—Adam Cant......Alderson "
Sales Agency, McAlester Fuel Co., McAlester, Okla.

No. 10 Mine; Slope; McAlester Seam, 34 in. thick.
PO—Dow, Okla.; **SP**—Same; **CTY**—Pittsburg; **RR**—C. R. I. & P.
MS—H. Smith............Dow, Okla.
S of H—Rope.

No. 4 Mine; Shaft; McAlester Seam; 34 in. thick.
PO—Dow, Okla.; **SP**—Same; **CTY**—Pittsburg; **RR**—C. R. I. & P.
MS—Chas. Newton........Dow, Okla.
S of H—Mules and rope.
S of M—7 elec. machines.
PP—5 return tubular boilers, 625 H. P. Purchase power.

No. 5 Mine; Slope; McAlester Seam, 34 in. thick. Operate washery.
PO—Dow, Okla.; **SP**—Same; **CTY**—Pittsburg; **RR**—M. K. & T.
MS—H. Patterson..........Dow, Okla.
S of H—Mules, rope, & 1 elec. loco. Track gauge 42 ins.
S of M—Hand.
PP—3 return tubular boilers, total 375 H. P., 2 gen. units, 250 volts D. C., 3 phase, 60 cycles, 4 pumps. Purchase power.
EMP—300. Last fiscal year output 38,000 tons.

No. 9 Mine; Shaft; McAlester Seam, 34 in. thick.
PO—Dow, Okla.; **SP**—Same; **CTY**—Pittsburg; **RR**—C. R. I. &P.
S of H—Elec. loco., mules, rope and gravity; track gauge, 42 in.
S of M—9 Elec. mach.
PP—4 F. M. & Co. return tubular boilers, total 600 H. P., 4 gen. units, 250 volts D. C., 1 pump.
EMP—400.

MILTON COAL MINING CO.
General Office, McAlester, Okla.
Slope Mine; Panama Vein; 72 to 120 In. thick.
PO—Milton, Okla.; **SP**—Same; **CTY**—Le Flore; **RR**—F. S. & W.
PR—W. E. Beaty.....McAlester, Okla.
TR—L. C. Cramer, " "
MS—Jos. Muma, " "
CE—H. A. Clark, " "
EM—H. A.Clark, " "
Note—Just commencing development.

MILTON CO-OPERATIVE COLONY.
Milton Mine; Panama Seam, 84 in. thick.
PO—Milton, Okla. **SP**—Same; **CTY**—Leflore; **RR**—F. S. & W.
PR—E. S. Lowther.....Guthrie, Okla.
TR—J. E. Woodworth, " "
MS—W. E. Beaty,......Milton, Okla.
GM—W. E. Beaty, " "
PA—W. E. Beaty, " "
SM—W. E. Beaty, " "
S of H—Mules.
S of M—Hand and mach.
PP—1 Watertube boiler.
EMP—40. Last fiscal year output 6,000 tons.
Note—Expect to increase output to 500 tons daily by November, 1916.

MISSOURI, KANSAS & TEXAS RY. CO. (Coal Dept.)
General Office, Parsons, Kan.
Four mines in Oklahoma, 3 mines in Kansas.
Nos. 10, 12, 14 and 17 Mines, 3 Shafts and 1 Slope, Lehigh Seam, 3 ft. 8 in. to 5 ft. thick.
PO—Coalgate, Okla. SP—Same. CTY—Coal. RR—M. K. & T.
GS—J. H. Hibben ......Parsons, Kan.
EM—E. H. Noel, “ “
PA—G. E. Scott...... St. Louis, Mo.
MS—Robt. Blackbird...Coalgate, Okla.
S of H—1 elec. loco. and mules. Track gauge 36 in.
S of M—Hand.
PP—16 water tube boilers, total 1,600 H. P., 1 gen. unit, 250 volts D. C., 1 compressor and 4 pumps.
EMP—650. Last fiscal year output 472,097 tons.

MOUNT CANAL DEVELOPMENT CO.
No. 6 Mine; Slope; Willeville No. 3 & 4 Seams; 44 to 48 in. thick.
PO Shadypoint, Okla.; SP Same; CTY—Le Flore; RR—Kansas City Southern
PR—Chas. Banks.....Shadypoint, Okla.
TR Edw. Hays, “ “
MS—Edw. Hay, “ “
GM—F. L. Mercer, “ “
PA—F. L. Mercer, “ “
SM—F. L. Mercer, “ “
CE P. Little.
S of H—1 steam loco.
S of M Hand
PP—1 return tubular boiler, total 60 H. P., 1 pump.
EMP 2. Last fiscal year output 258 tons.

NEW STATE COAL CO.
General Office, Tulsa, Okla.

PR—Arthur L. Murphy....Tulsa, Okla.
TR—G. E. Williamson, “ “
GM—G. E. Williamson, “ “
PA—G. E. Williamson, “ “
CE—G. E. Williamson, “ “

Collinsville Mine, Stripping, Collinsville Seam, 25 in. thick.
PO—Collinsville, Okla. SP — Same. CTY Rogers. RR—A. T. & S. Fe.
MS—C. D. Evans....Collinsville, Okla.
S of H—Mules.
S of M—Steam shovel.
EMP—150. Last fiscal year output 23,000 tons.

Broken Arrow Mine, Stripping, Adams Creek Seam, 26 in. thick.
PO—Broken Arrow, Okla. SP—Same. CTY—Tulsa. RR—M. K. & T., Osage Div.
MS—J. H. Calvin..Broken Arrow, Okla.
S of H—Mules.
S of M—Steam shovel.
EMP—152. Last fiscal year output 26,000 tons.

Dawson Mine; Stripping, Dawson Seam, 30 in. thick.
PO Dawson; SP Same; CTY—Tulsa; RR Frisco.
MS—C W. Albright....Dawson, Okla.
S of H Mules.
S of M Steam shovel.
EMP 150.
New mine.

OAK RIDGE COAL CO.
Drift and Slope Mine, Lower Hartshorne Seam, 53 in. thick.
PO Red Oak, Okla.; SP—Same; CTY—Latimer; RR—C. R. I. & P.
PR—J. B. Hilling......Red Oak, Okla.
GM—J. B. Hilling, “ “
PA—J. B. Hilling, “ “
MS J. B. Hilling, “ “
TR—E. H. Smallwood, “ “
SM—E. H. Smallwood, “ “
S of H Mules and steam loco.
S of M—Hand.
PP—1 Return tubular boiler, total 125 H. P.
EMP—50. Last fiscal year output 50,000 tons.
Sales Agency, McAlester Fuel Co., McAlester, Okla.

OKLAHOMA CONSOLIDATED COAL CO.
General Office, Muskogee, Okla.
PR E. N. Breitung...Muskogee, Okla.
TR—W. A. Hamilton, “ “
GM—R. T. Price, “ “
PA—R. T. Price, “ “
GS C. P. Shockley......Dewar, Okla.
EM C. E. Schurch, “ “
EE—A. C. Mitchell, “ “
SCO—Seymour Company. Buyer, Wm. Seymour, Dewar, Okla.

No. 3 Mine; Shaft; Henryetta Seam; 34 to 38 in. thick.
PO Dewar, Okla.; SP—Same; CTY—Okmulgee; RR—M. O. G.
MS—Patrick O'Harra....Coalton, Okla.
S of H—Mules and 2 elec. locos. Track gauge 42 in.
S of M—8 elec. mach.
PP—2 return tubular boilers, total 170 H. P., 1 gen. unit, 2 pumps.
EMP—175. Last fiscal year output 120,000 tons.

No. 5 Mine; Slope; Henryetta Seam; 34 to 38 in. thick.
PO Dewar, Okla.; SP Same; CTY—Okmulgee; RR—M. O. G.
MS—Miller Hay.........Dewar, Okla
S of H Mules and 2 elec. locos. Track gauge 44 in.
S of M 4 elec. mach.
EMP—100. Last fiscal year output 42,000 tons.
PP 2 pumps.

No. 6 Mine; Slope; Henryetta Seam; 34 to 38 in. thick.
PO—Dewar, Okla. SP—Same; CTY—Okmulgee; RR—M. O. G.
MS—John Almond.......Dewar, Okla.
S of H Mules and 2 elec. locos. Track gauge 44 in.
S of M—8 elec. mach.
PP—2 return tubular boilers, total 170 H. P., 2 pumps.
EMP—150. Last fiscal year output 110,000 tons.

No. 9 Mine; Slope; Henryetta Seam; 34 to 38 in. htick.
PO—Dewar, Okla.; SP—Same; CTY—Okmulgee; RR—M. O. G.
MS—A. F. Paterson...Henryetta, Okla.
SM A. F. Paterson, “ “
S of H—Mules. Track gauge 42 in.
S of M—2 elec. mach.
PP—1 return tubular boiler, total 85 H. P., 1 pump.

OKLAHOMA MINING & STRIPPING CO.
Strip Pits Mine; Stripping; Upper Hartshorne Seam; 20 to 66 in. thick.
PO—Lehigh, Okla.; SP—Midway, Okla.; CTY—Coal; RR—M. K. & T.
PR James McConnell..Wilburton, Okla.
VP—J. C. Reid......McAlester, Okla.
GM—J. C. Reid “ “
GS—J. C. Reid, “ “
TR—P. R. Allen “ “
PA—J. C. Reid, “ “
MS—J. F. Scott, “ “
MM H. L. Reager, “ “
EE H. L. Reager, “ “
SCO—Address the Company. Buyer, J. P. Fisher, Lehigh, Okla.
S of H—3 steam locos. Track gauge 36 in.
S of M—2 Sullivan machines and 1 steam shovel.
PP—4 return tubular boilers, total 400 H. P., 2 gen units, 400 volts A. C., 3 phase, 60 cycles, 5 pumps, Purchase power.
EMP—55. Output 750 tons per day.

OKMULGEE COAL CO., THE
Blackstone Nos. 1 and 2 Mines; Slopes; Henryetta Seam, 36 to 42 in. thick.
PO Henryetta, Okla.; SP—Same; CTY—Okmulgee; RR M. O. & G., Dennison Div. and Frisco Sapulpa Br.
PR—W. Thornburg.....Okmulgee, Okla.
TR—W. Thornburg, “ “
GS H. S. Kaeiser....Henryetta, Okla.
MS H. S. Kaeiser, “ “
SM Scott Lockhart, “ “
S of H—Mules.
S of M—3 Sullivan elec. mach.
PP—2 return tubular boilers, 1 pump and power purchased.
EMP—150.
Formerly Blackstone Collieries, Inc.

OSAGE COAL & MINING CO.
Receiver, James Duncan, Krebs, Okla.
Nos. 5, 7 and 8 Mines; Shaft and Slop; McAlester Seam, 50 in. thick.
PO—Krebs, Okla.; SP—Same; CTY—Pittsburg; RR—M. K. & T. ...
EM—Harry Shaw.....McAlester, Okla.
MM—Dan Lewis. “ “
MS W. H. Collins......Krebs, Okla.
CE—S. K. Smith, ...St. Louis, Mo.
EE—Chas. Mellor, No. McAlester, Okla.
S of H—Mules and rope.
S of M—5 Elec. mach. and hand.
PP—Power purchased.
EMP—175. Last fiscal year output 65,290 tons.
Sales Agency, McAlester Fuel Co., McAlester, Okla.

PLEASANT VALLEY COAL & COKE CO.
General Office, McAlister, Okla.
PR P. R. Allen.....McAlester, Okla.
TR C. E. Chapman “ “
GS William Ogilvie....Schulter, Okla.
PA—William Ogilvie “ “
GS—William Ogilvie, “ “
EE—J. M. Williams “ “

No. 1 Coalton Mine; Drift; Henryetta Vein; 27 to 36 in. thick.
PO—Schulter, Okla.; SP—Coalton; CTY—Okmulgee; RR—M. O. & G.
S of H—Mules and rope. Track gauge 42 in.
S of M—3 elec. mach.
PP—1 return tubular boiler, 150 H. P., Receive power from No. 2 Mine.
EMP—75. Last fiscal year output 49,547 tons.

No. 2 Pleasant Valley Mine; Shaft; Henryetta Vein, 27 to 36 in. thick.
PO—Schulter; SP—Same; CTY—Okmulgee; RR—Frisco.
S of H—Mules & Rope. Track gauge 42 in.
S of M 3 elec. mach.
EMP—80. Last fiscal year output 36,435 tons
PP 2 return tubular boilers, total 300 H. P., 1 gen. unit, 2300 volts A. C., 3 phase and 60 cycles, 1 elec. pump. Turbine generator, 500 K. W.
Sales Agencies, McAlester Fuel Co. and Fidelity Fuel Co.
Note—Cenral plant furnishing power for both mines.
Note—This mine has been idle since Dec. 3d, 1915

PIERCE COAL CO.
General Office, Carbon, Okla.
Whiskers Mine; Slope; No. 1 Seam. 48 to 60 in. thick.
PO—Adamson, Okla.; SP—Same; CTY—Pittsburg; RR—M. K. & T.; Wilburton Branch.
PR—P. G. Pierce, ...Carbon, Okla.
GM—P. G. Pierce, “ “
GS—P. G. Pierce, “ “
PA—E. P. Joyner, “ “
TR—E. P. Joyner, “ “
MM—Clyde Hale, “ “
MS—Wm. Vickers,.....Adamson, Okla
S of H Mules.
S of M—Hand.
Last fiscal year output 25,000 tons.
Sales Agency, McAlester Fuel Co., McAlester, Okla.

POCAHONTAS COAL CO.
General Office, McAlester, Okla.
C. F. Wingate, Receiver, Hartshorne, Okla.
Pocahontas Mine; Slope; Hartshorne Seam, 48 in. thick.
PO—Pocahontas, Okla.; SP—Haileyville, Okla.; CTY—Pittsburg.
PR—W. E. Beaty......McAlester, Okla.
TR—W. E. Beaty, “ “
EM—B. E. Clark, “ “
SCO—Baker-Reidt Merc. Co., Pocahontas, “
S of H—Rope and mules.
S of M Hand and 5 comp. air mach.
PP—5 Return tubular boilers, 1 compressor, 1 pump.
Note—Closed down.

POTEAU COAL COMPANY.
General office, Poteau, Oklahoma.
Arko Mine; Slope; upper Witteville Seam; 46 to 49 in. thick.
PO Poteau, Okla; SP—Same; CTY—Le Flore; RR—Ft. S. P. & W.
PR—J. E. Fleming, ... Poteau Okla.
TR—Doug. C. Lane ” ”
GM J. E. Finney ” ”
GS—J. E. Finney........Poteau, Okla.
PA—J. E. Finney, ” ”
CE J. E. Finney, ” ”
EM—H. O. Lewis, ” ”
S of H—2 elec. locos. Track gauge 36 in.
S of M—4 elec. chain machs.
PP—2 Return tubular boilers, total 250 H. P., 250 volts D. C., 2 air comp. 4 pumps. Purchase power.
Note—Successors to Arko Coal Company.

ROCK ISLAND COAL MNG. CO.
General Office, 139 W. Van Buren St., Chicago, Ill.
PR—Carl Scholz ....Chicago, Ill.
GM—H. S. Mikesell......Chicago, Ill.
TR—Geo. H. Crosby........Chicago, Ill.
PA—H. S. Mikesell, “ “
GS—Wm A. Evans....Hartshorne, Okla.
MM—Wm. Cameron. “ “
Sales agency, McAlester Fuel Co., McAlester, Okla.

Nos. 7.8, 10 and 40 Mines; Shaft and Slope; Hartshorne Seam, 42 to 72 in. thick.
PO—Hartshorne, Okla. SP—Same. CTY—Pittsburg. RR—C. R. I. & P.
MS—P. W. Mallory.....Alderson, Okla.
S of H—Elec. and mules. Track gauge 42 in.
S of M—Elec. and hand.
PP—Gen. units D. C.
EMP—843. Last fiscal year output 464,463 tons.

Nos. 5, 9 and 38 Mines; Shaft; Alderson Seam, 40 in. thick. Operate Washery.
PO—Alderson, Okla. SP—Same CTY—Latimer. RR—C. R. I. & P.
MS—P. W. Mallory.....Alderson, Okla.
S of H Mules. Track gauge 42 in.
S of M—Hand.
EMP—340. Last fiscal year output 133,331 tons.
No 9 is a new mine.

ROSS-CALDWELL COAL MINING CO.
No. 2 Mine; Slope; Seam 54 in. thick.
PO—Lehigh, Okla; SP—Same; CTY—Coal; RR—M. K. & T.
PR—A. K. Ross........Lehigh, Okla.
TR—Roy Caldwell, “ “
MS—R. D. Travel, “ “
MM—Wm. Cowan, “ “
S of H—Steam and mules.
S of M—Hand.
EMP 54. Last fiscal year output 36,000 tons.
Formerly Ross & Holstead.

SAVANNA MINING COMPANY.
General office, McAlester, Okla.
Brewer Mine; Slope; McAlester Seam; 50 in. thick.
PO—Savanna, Okla. SP—Same CTY—Pittsburg; RR M. K. T.
PR H. W. Adams, .. McAlester, Okla.
TR—H. W. Adams, ” ”
GM—F. F. LaGrave, “ “
MS—George C. McAlpine, Savanna, Okla.
SCO—Baker-Reidt Merc. Company.
S of H Mules and rope; Track gauge 36 inches.
S of M Comp. air mach. and hand.
PP—5 boilers Total 500 H. P.,
EMP 120. Last fiscal year output, 31081 tons.
Note—Successors to Dow Coal Company.

SOUTHERN FUEL CO.
General Office, McAlester, Okla.
Brewer Mines; 2 Slopes; McAlester Seam, 50 in. thick. Operate washery.
PO—Savanna, Okla.; SP—Same; CTY—Pittsburg; RR M. K. T., Main Line.
PR—H. W. Adams....McAlester, Okla.
TR—H. W. Adams, “ “
GM—F. F. LaGrave, “ “
MS—George C. McAlpine, Savanna, Okla.
SM—James B. Cassada, “ “
S of H—Mules and rope; track gauge, 36 in.
S of M—2 Comp. air mach. and hand.
PP—5 Boilers, total 500 H. P., 1 compressor, 2 pump.
EMP—100. Last fiscal year output 63,002 tons.
Sales Agency, Southern Fuel Co., Dallas, Texas.
Successors to the Brewer Coal & Mining Co.

SOUTHWEST COAL CO.
General Office, Tulsa, Okla.
Slope Mine; Bituminous Seam, 30 in. thick.
PO—Dawson, Okla; SP Same; CTY—Tulsa; RR Frisco.
PR—O. H P. Thomas......Tulsa, Okla.
..**TR**—O. H. P. Thomas, “ “
GM—U. T. Brown.......Dawson, Okla.
MS—U. T. Brown, “ “
GS—U. T. Brown, “ “
MM—John Funkhouser, “ “
S of H—Steam loco. and mules.
S of M—Hand.
PP—One Springfield water tube boiler, 80 H. P., 2 pumps.
EMP—40. Last fiscal year output 15,000 tons.

TEXAS COAL COMPANY THE.
General office, McAlester, Okla.
PO—Hughes, Okla. SP Same; CTY—Latimer; RR—Rock Island.
PR—G. L. Blackford, .. Denison, Tex.
TR—G. L. Blackford, ” ”
SEC—T. W. Clelland, ” ”
GM T. W. Clelland, ” ”
GS T. W. Clelland, ” ”
VP—E. A. Elliott, ” ”
SM—M. J. Guest, Hughes Okla.
Note—Successors to Turkey Creek Coal Company Just commencing development work.

UNION COAL CO.
Receiver, C. S. Wingate, Hartshorne, Okla.
General Office, Hartshorne, Okla.
Nos. 2, 6 and 7 Mines; Hartshorne and McAlester Seams, 36 to 48 in. thick.
PO—Adamson, Okla.; SP—Same; CTY—Pittsburg; RR—M. K. & T., Wilburton Br.
PR G. A. Riedt......Hartshorne, Okla.
TR—C. S. Wingate..Hartshorne, Okla.
GM—C. S. Wingate, “ “
PA—C. S. Wingate, “ “
GS—A. McKennon......Adamson, Okla.
EM—B. E. Clark,......McAlester, Okla.
MM—I. Mossop........Adamson, Okla.
SCO—Baker-Reidt Merc. Co., Adamson, “
S of H—Mules.
S of M—Hand.
PP—Return tubular boilers, 1 compressor.

VICTORIA COAL CO.
No. 1 Mine; Shaft; Henryetta, Seam.
PO—Henryetta, Okla.; SP—Same; CTY—Okmulgee; RR—Frisco, Main Line.
PR—James Cameron.....Henryetta, Okla.
GM—James Cameron, “ “
PA—James Cameron, “ “
TR—Jos. Hillman, “ “
MM—W. R. Kerr, “ “
EE—Otto Miller, “ “
MS—Jos. Johnson, “ “
SM—H. L. Shriver, “ “
EM—M. J. Smith......McAlester, Okla.
S of H—Mules; track gauge 42 in.
S of M—6 Elec. mach.
PP—2 Casey-Hedges, return tubular boilers, gen. unit 250 volts D. C., 100 K. W., 1 pump.
EMP—141.
Last fiscal year output 78,483 tons.

WARDEN-PULLEN COAL CO.
Warden Mine, Shaft, Bituminous Seam, 36 in. thick.
PO—Henryetta, Okla.; SP—Same; CTY—Okla. RR—Frisco.
PR—J. J. Pullen......Henryetta, Okla.
GM—J. J. Pullen, " "
PA—J. J. Pullen, " "
GS—J. J. Pullen......Henryetta, Okla.
EM—Jas. A. Pullen, " "
MM—Jas. A. Pullen, " "
EE—Jas. A. Pullen, " "
SCO—Warden-Pullen Store. Buyer, J. J. Pullen, Henryetta, Okla.
S of H—Mules and rope. Track gauge 35 ins.
S of M—3 elec. machines.
PP—Boilers, total 140 H. P., 4 gen. units, 1 pump.
EMP—87. Last fiscal year output 109,800 tons.

WILBURTON COAL & MINING CO.
No. 1 Mine; Slope; Hartshorne Seam, 60 in. thick.
PO—Wilburton, Okla.; SP—Same; CTY—Latimer; RR—Rock Island.
PR—J. J. Katigan, .Wilburton, Okla.
GM—J. J. Katigan, " "
PA—J. J. Katigan, " "
MS—J. J. Katigan, " "
TR—M. Katigan......Wilburton, Okla.
CE—Mr. Clark, " "
S of H—Steam hoist.
S of M—Hand.
PP—1 boiler; 1 engine and 3 pumps.
EMP—6.

WILLIAMS COAL CO.
PO—Williams and Hartshorne, Okla.; CTY—LeFlore and Pittsburgh.
No report.

WRIGHT COAL CO.
Davidson and E. B. Morgan Mines, Shaft, Seam 3 ft. thick.
PO—Dewar, Okla. SP—Same. CTY—Okmulgee. RR—M. O. & G.
PR—James Davidson ......Dewar, Okla.
PA—James Davidson, " "
TR—J. E. Key, " "
GM—J. P. Duncan, " "
MS—J. P. Duncan and E. B. Morgan, Dewar, Okla.
S of H—Mules.
S of M—Hand.
EMP—32. Last fiscal year output 1,300 tons.
Sales agent, J. E. Key, Dewar, Okla.
(Old information.)

PENNSYLVANIA ANTHRACITE

For List of Abbreviations See Page 622.

ALDEN COAL CO.
Alden Mine; 2 Shafts; 36 to 96 in. thick.
PO—Alden Station, Pa. SP—Same. CTY—Luzerne. RR—C. R. R. of N. J.
PR—M. S. Kemmerer..Mauch Chunk, Pa
TR—K. M. Smith . Alden Station, Pa.
GM—K. M. Smith, " "
PA—K. M. Smith, " "
MS—K. M. Smith, " "
EM—W. S. Norton, " "
CE—R. V. Morris....Wilkes-Barre, Pa.
SCO—Alden Supply Co., Ltd. Buyer, John M. Phillips, Alden Station, Pa.
S of H—2 Steam and 3 gasoline loco. Track gauge 30 in.
S of M—Hand.
PP—11 return tubular boilers, total 2,262 H. P., 3 air compressors and 3 pumps.
EMP—737. Last fiscal year output 293,120.04 tons.
Sales agency, Whitney & Kemmerer, New York, N. Y., and Philadelphia, Pa.

ALLIANCE COAL MNG. CO.
Alliance Colliery, Shaft and Drift, Diamond and Buck Mtn Seams, 2½ to 3 ft. thick.
PO—Kaska, Pa. SP—Middleport, Pa. CTY—Schuylkill. RR—P. & R., Schuylkill Valley Branch and Alliance Branch.
PR—S. D. Warriner..Philadelphia, Pa.
PA—E. Hughes, " "
GM—E. Ludlow ....Lansford, Pa.
VP—E. Ludlow, " "
EM—W. H. Wignall, ...Pottsville, Pa.
S of H—2 steam loco. and mules.
S of M—10 comp. air mach and hand.
PP—15 return tubular, Logan, Jeanesville and Chambersburg boilers, total 2,250 H. P., 1 compressor and 2 pumps.
Sales agency, Lehigh Coal & Navigation Co., Philadelphia, Pa.
Temporarily abandoned.

ARCHBALD COAL CO.
General Office, Wilkes-Barre, Pa.
Binghampton Colliery; Shaft; Drift, and Slope; Grassy Island, New County, Clark and Dunmore Seams, 24 to 168 in. thick.
PO—Archbald, Pa.; SP—Same; CTY—Lackawanna; RR—D. & H.
PR—James H. Hughes..Wilkes-Barre, Pa.
GM—James H. Hughes, " "
PA—C. Roy Sterling, " "
TR—John Manier....Binghamton, N. Y.
EM—Walter C. Hughes, ..Archbold, Pa.
MS—R. Howells........Archbald, Pa.
S of H—3 steam and 1 gasoline loco., mules, rope and firavity; track gauge 36 in.
S of M—Hand.
PP—1 Water, 4 return tubular boilers, total 600 H. P., 2 compressors, 1 pump.
EMP—373. Last fiscal year output 152,127 tons.
Sales agent, Roberson-Fowler Coal Co. Binghampton, N. Y.

BLACK HEATH COAL CO.
Black Heath Mine; CTY—Schuylkill.
MS—James Scott......Minersville, Pa.
State report.

BUCK RIDGE COAL MINING CO.
Buck Ridge Mine; Slope.
PO—Shamokin, Pa.; SP—Same; CTY—Northumberland.
PR—Howard S. Brown
No. 1 Broadway, New York, N. Y.
TR—Gardner Pattison.
No. 1 Broadway, New York, N. Y.
GM—Telford Lewis......Johnstown, Pa.
GS—Raymond Lewis......Shamokin, Pa.
PA—Raymond Lewis, " "
S of H—3 Steam loco.; track gauge, 36 in.
S of M—Hand.
PP—1 Heine water tube, 7 Heine return tubular boilers, total 1,100 H. P., 4 pumps.
EMP—400. Last fiscal year output, 141,832 tons.

BUCK RUN COAL CO.
Buck Run Mine, Slope, Crosby, Daniel, Skidmore, Seven Ft. and Buck Mtn Seams, 3 to 16 ft. thick.
PO—Minersville, Pa. SP—Rohrersville. Pa.; CTY—Schuylkill; RR—P. & R., Mine Hill Br.
PR—Jas. B. Neale....Minersville, Pa.
GM—Jas. B. Neale, " "
PA—J. F. Hay, " "
EM—W. L. Cross.......Minersville, Pa.
EE—W. L. Cross, " "
TR—James H. Collier, " "
S of H—1 Steam and 6 Elec. loco., and mules; track gauge 36 in.
S of M—Hand.
PP—9 water tube boilers, total 1,900 H. P., 2 gen. units, volts 550 A. C. and 250 D.C., 3 phases, 60 cycles. 3 air compressors and 4 pumps.
EMP—664. Last fiscal year output 286,595 tons.
Sales agent, Thorne-Neale & Co., Phila-Pa.

BULLS HEAD COAL CO.
Bulls Head Mine; Slope; Seam 60 in. thick.
PO—Scranton, Pa. SP—Park Place, Pa. CTY—Lackawanna; RR—D. & H., D. L. & W.
PR—David Spruks........Scranton, Pa.
TR—David Spruks, " "
GM—David Spruks, " "
PA—J. Law, " "
MS—Chas. Walker, " "
S of H—Steam loco., mules and elec.
S of M—Hand.
PP—1 boiler, 200 H. P., 1 compressor.
EMP—163. Last fiscal year output 61,546.09 tons.
Sales agent, M. Schlowen, Pottsville, Pa.

BUTCHER CREEK COAL CO.
General Office, St. Clair, Pa.
Laurel Run Mine, Slope and Stripping. "Juggler" Seam, 20 to 100 ft. thick.
PO—Broad Mountain, Pa. SP—Minersville, Pa. CTY—Schuylkill. RR—P. & R., Mine Hill Branch.
GM—L. J. Whims......St. Clair, Pa.
PA—L. J. Whims, " "
S of H—Mules and rope. Track gauge 30 in.
S of M—Hand.
PP—5 return tubular boilers, total 500 H. P., 10 engines, 4 pumps.
EMP—100.
Sales agent, Hall Bros., Baltimore, Md., Slattery Bros., Philadelphia, Pa., and L. J. Whims & Co., St. Clair, Pa.

CAMBRIDGE COAL CO.
Cambridge Mine, Slope, Dunmore, Clark Holmes Seam, 3 to 12 ft. thick. Operate washery partly.
PO—Shenandoah, Pa. SP—Same. CTY—Schuylkill. RR—P. & R.
TR—W. J. James.....Shenandoah, Pa.
MM—Wm. E. Smith, " "
S of H—Mules and 1 steam loco. Track gauge 42 in.
S of M—Hand.
PP—4 boilers, total 550 H. P.
EMP—110. Last fiscal year output 78,897 tons.
Sales agent, F. W. Kennedy & Co.
(Old information.)

CARBON CREEK COAL COMPANY
General Office, Board of Trade Bldg., Scranton, Pa.
Milson Colliery Mine; Drift, Slope and Shaft; Orchard, Primrose, Mammoth, Holmes, Skidmore and Lykens Valley Seams. Operate Eureka Washery.
PO—Shamokin, Pa.; SP—Same; CTY—Northumberland; RR—Phila. & Reading, Carbon Run br.
PR—Milton W. Lowry,...Scranton, Pa.
TR—Milton W. Lowry, " "
GM—Milton W. Lowry, " "
CE—W. A. Thomas " "
GS—M. F. Dolphin.....Shamokin, Pa.
PP—440 volts, 2 phase, 60 cycle. Buy power.

CARBONDALE COAL MINING CO.
Loland; Mine, Slope, Dunmore, Clark Seam 3 to 10 ft. thick.
PO—Carbondale Pa.; SP—Same; CTY—Lackawanna; RR—D. & H.
PR—John J. Boland....Carbondale, Pa.
GM—John J. Boland, " "
GS—John J. Boland, " "
PA—John J. Boland, " "
MS—John Magnor, " "
TR—H. P. Mellet,.......Scranton, Pa.
S of H—Mules.
S of H—Hand.
PP—3 Return tubular boilers, 1 pump.
EMP—92. Last fiscal year output 31,672 gross tons.
(Old information.)

CARLTON COAL CO.
Slope and Drift.
PO—Scranton, Pa. SP—So. Scranton, Pa. CTY—Lackawanna. RR—D. & H.
PR—John Gibbons ......Scranton, Pa.
GM—John Gibbons......Scranton, Pa
TR—A. J. Manley. " "
S of H—Mules. Track gauge 3 ft.
S of M—Hand.
PP—1 water tube boiler, total 40 H.P. Also purchase power.
EMP—65. Last fiscal year output [illegible]0,[illegible]00 tons.
(Old information.)

CARNEY & BROWN COAL CO.
Carney & Brown Mine, Slope, Clark Seam 3½ to 6 ft. thick.
PO—Dunmore, Pa. SP—Same. CTY—Lackawanna. RR—D. L. & W., Winton Br.
PR—John Carney ....Dunmore, Pa.
GM—John Carney, " "
PA—John Carney, " "
TR—Margaret Brown, " "
GS—John J. Brown, " "
MS—Thos. Mullen, " "
S of H—Rope and mules. Track gauge 28 in.
S of M—Hand.
PP—3 return tubular boilers, total 360 H. P.
EMP—80. Last fiscal year output 36,330 tons.

CENTRAL COAL CO.
Wyoming Colliery; Slope and Drift; Seam 48 to 144 in. thick.
PO—Hudson, Pa.; SP—Same; CTY—Luzerne; RR—D. & H.
PR—A. F. Wolf, ...Hudson, Pa.
TR—A. F. Wolf, " "
GM—A. F. Wolf, " "
PA—C. E. Banker, " "
MS—W. J. Startzell, " "
CE—John B. Tamblyn, " "
S of H—Elec. and steam loco.; track gauge 36 in.
S of M—Hand and 1 comp. air mach.
PP—1 Erie City Boiler, 100 H. P., gen. units, 440 volts A. C., 2 pumps, also purchase power.
EMP—130.
Sales Agency, J. S. Wentz & Co., Philadelphia, Pa.

CLEAR VIEW COAL CO.
Conklin Mine; Shaft Diamond, Rock. Big and Clark Seams, 2 ft. 5 in. to 18 ft. thick.
PO—Scranton, Pa. SP—Same. Park Place Station, Pa. CTY—Lackawanna. RR—O. & W.
PR—F. M. Van Horn ...Scranton, Pa.
TR—F. P. Christian, " "
GS—Wm. McLaughlin, " "
PA—R. L. Kissinger, " "
MS—W. E. Martwick, " "
EE—W. B. Dommick, " "
CE—J. H. Pearn, " "
S of H—2 elec. loco.. Track gauge 36 in.
S of M—2 elec. mach.
PP—Power purchased.
EMP—200. Last fiscal year output 44,000 tons..

CLINTON FALLS COAL CO.
General Office, Scranton, Pa.
Clinton Falls Mine; Drift; Dunmore Nos. 1, 2 and 3 Seams, 36 to 80 in. thick.
PO—Forest City, Pa.; SP—Same; CTY—Susquehanna; RR—N. Y. O. & W.
PR—Daniel P. Pace......Scranton, Pa.
GS—Daniel P. Pace, " "
TR—J. A. Pace, " "
GM—M. A. Pace, " "
PA—John Pace, " "
MS—Joseph J. Cleary, ..Forest City, Pa.
MM—Jas. Hearley....Forest City, Pa.
EM—Joseph Cleary....Forest City, Pa.
S of H—1 steam loco., mules and rope. Track gauge 30 in.
S of M—Hand.
PP—1 water tube boiler, 150 H. P., 3 phase. Purchase power.
EMP—75. Last fiscal year output 11,000 tons.
Sales Agent, D. P. Pace, Scranon, Pa.

COLONIAL COLLIERIES CO.
General Office, North American Building. Philadelphia Pa.
Natalie Mine, Slope, Buck Mtn and Lykens Valley Seam, 2 to 15 ft. thick.
PO—Natalie, Pa. SP—Same. CTY—Northumberland. RR—P. & R., Natalie Branch.
PR—Percy C. Madeira..Philadelphia, Pa.
TR—Louis C. Madeira, " "
GM—W. G. Thomas.....Pottsville, Pa.
PA—W. G. Thomas, " "
EM—Chas. J. Groff, " "
MS—Jacob Holt..........Natalie, Pa.
MM—Wm. Shlotterbach....Natalie, Pa.
EE—Fred Riley, " "
SCO—Natalie Store Co. Buyer, Allan J. Weir, Natalie, Pa.
S of H—4 steam loco., mules and rope. Track gauge 36 in.
S of M—Hand and comp. air.
PP—4 water tube, 6 return tubular boilers, total 2,200 H. P., 2 gen. units, 2,300 volts A. C., 2 compressors.
EMP—550. Last fiscal year output 237,992 tons.
Sales agent, Madeira, Hill & Co., Philadelphia, Pa.

CONLON JOHN
Conlon Mine; Slope; Wyoming & Bennett Veins; 20 to 30 in. thick.
PO—Hudson, Pa., SP—Same; CTY—Luzerne; RR—Delaware & Hudson.
PR—John Conlon, ...Hudson, Pa.
PA—John Conlon, " "
MS—John Conlon, " "
EM—John Conlon, " "
S of H—Mules and elec. loco.
S of M—Hand.
PP—Boiler, total 275 H. P., 220-440 volts A. C., 2 phase, 60 cycle. Purchase power.
EMP—150. Last fiscal year output, 50,100 tons.

CONNELL ANTHRACITE MINING CO.
General Office, Scranton, Pa.
Connell Mine, Drift, Seams 3 to 8 ft. thick.
PO—Bernice, Pa.; SP—Same; CTY—Sullivan; RR—L. V., Bowman Creek Branch.

(Continued on Next Page.)

Connell Anthracite Mng. Co.—Cont.
PR—W. L. Connell.......Scranton, Pa.
GM—W. L. Connell, " "
TR—J. S. McAnulty, " "
PA—H. A. Connell, " "
EM—Carl S. Motiska " "
MS—T. V. McLaughlin....Bernice, Pa.
MM—John McDonald, " "
S of H—12 Elec. loco.; track gauge 36 in.
S of M—12 Elec. mach.
PP—7 water tube boilers, total 1,900 H.P., 10 gen. units, 2 pumps.
EMP—470. Last fiscal year output 333,177 tons.

COXE BROS & CO.
See Lehigh Valley Coal Co.

DARKWATER COAL CO.
Newcastle Mine; Slope; Crosby, Mammoth, Skidmore, and Buck Mtn Seam, 36 to 600 in. thick.
PO—Minersville, Pa. SP—Darkwater, Pa. CTY—Schuylkill. RR—Penna. P.S. V. Branch.
PR—Jas. B. Neale.....Minersville, Pa.
GM—Jas. B. Neale, " "
PA—J. F. Hay, " "
MS—John Conway, " "
EM—W. L. Cross.......Minersville, Pa.
EE—W. L. Cross, " "
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—2 Water tube and 6 return tubular boilers, total 1200 H. P., 2 compressors, 2 pumps.
EMP—240. Last fiscal year output 137,026 tons.
Sales agent, Thorne Neal & Co., Philadelphia, Pa.

DAVIS, JOHN H. COAL CO.
Ellsworth Mine, Slope and Stripping, Mammoth Seam 8 to 40 ft. thick.
PO—St. Clair, Pa.; SP—Same; CTY—Schuylkill; RR—Phila. & Reading.
GM—J. Arthur Davis.
PA—J. Arthur Davis.
GS—J. Arthur Davis.
S of H—Mules, 2 steam loco.; track gauge 30 in.
S of M—Hand.
PP—6 Return tubular boilers, total 400 H.P.
EMP—90. Last fiscal year output 40,000 tons.
Sales Agents, C. D. Norton Co., Philadelphia, Pa.
(Old information.)

DELAWARE & HUDSON CO. (THE)
General Office, Scranton, Pa.
PR—L. F. Loree......New York, N. Y.
VP—(In charge of operations) W. H. Williams, New York, N. Y.
TR—C. A. Walker....New York, N. Y.
PA—J. White Sprong....Albany, N. Y.
Asst Supts—Charles Dorrance, Jr., and E. R. Pettebone......Scranton, Pa.
EM—R. H. Buchanan.....Scranton, Pa.
ME—C. A. Straw,......Scranton, Pa.
EE—George E. Gramm, " "
Engineer in charge of machine mining—Cadwalad r Evans, Scranton, Pa.
Sales Agency, The Hudson Coal Co.

Baltimore No. 5 Mine; Shaft, Baltimore, Ross, Red Ash, Checker, Abbott, Kidney, Hillman, Snake Island and Stanton Seams 36 to 216 in. thick.
PO—Parsons, Pa.; SP—Same; CTY—Luzerne; RR—D. & H.
MF—James Peters........Parsons, Pa.
S of H—2 Elec., 1 steam loco., mules rope and gravity.
S of M—Hand.
PP—6 B. & W., water tube, 16 loco. type return tubular boilers, toal 5100 H. P., 3 gen. units 2200 volts A. C., 3 phase, 25 cycles; 2 compressors, 6 pumps.
EMP—871. Last fiscal year output 405,360 tons.

BALTIMORE TUNNEL—Tunnel, Stanton, Baltimore and Red Ash Seams, 45 to 216 in. thick.
PO—Wilkes-Barre, Pa.; SP—Same; CTY—Luzerne; RR—D. & H.
MF—David J. Edwards..Wilkes-Barre, Pa.
S of H—3 Elec., 2 steam loco., mules, rope and gravity; track gauge 36 in.
S of M—Hand.
PP—4 Stirling, water tube, 3 loco type return tubular boilers total 1755 H. P., gen. units 275 volts D. C., 6 pumps.
EMP—375. Last fiscal year output 175,692 tons.

BOSTON MINE—Shaft, Red Ash, Bennett, Five Foot Bennett and Cooper Seams 72 to 180 in. thick.
PO—Plymouth, Pa.; SP—Same; CTY—Luzerne; RR—D. & H.
MF—Wm. A. Jones......Plymouth, Pa.
S of H—Mules, rope and gravity; track gauge 36 in.
S of M—Hand.
PP—4 Stirling, water tube boilers, total 1080 H. P., 2 compressors, 1 pump.
EMP—494.

COAL BROOK MINE—Drifts; Grassy Island, Top, Bottom and Third Seams, 36 to 72 in. thick.
PO—Carbondale, Pa.; SP—Same CTY—Lackawanna RR—D. & H.
MF—James Tasker......Carbondale, Pa.
S of H—31 Elec. 6 seam loco., rope, mules and gravity; track gauge 30 in.
S of M—Hand.
PP—4 Water tube, 6 return tubular boilers total 2292 H. P., 2 gen. unit 2300 volts A. C., 3 phase, 25 cycles; 3 pumps.
EMP—1536. Last fiscal year output 682,767 tons.

DELAWARE MINE—Shaft, Five Foot, Cooper, Bennett, Ross Three Foot, Red Ash and Checker; 33 to 96 in. thick.
PO—Hudson, Pa.; SP—Same; CTY—Luzerne; RR—D. & H.
MF—Jos. D. Campbell....Hudson, Pa.
S of H—4 Elec., 1 steam loco., mules, rope and gravity; track gauge 28 in.
S of M—Hand.
PP—6 Stirling, water tube boilers, total 1620 H. P.. 1 Gen. units 275 volts D. C., 2 compressors, 3 pumps.
EMP—701. Last fiscal year output 322,731 tons.

EDDY CREEK MINE; Shaft, slope and drift; No. 2 Four Foot, Diamond, Rock, Fourteen Foot, New County, Clark, Dunmore No. 4 and Upper Four Foot; 20 to 72 in. thick.
PO—Olyphant, Pa.; SP—Same; CTY—Lackawanna; RR—D. & H.
MF—P. W. Fadden......Olyphant, Pa.
S of H—3 Comp. air, 4 elec., 3 steam loco., gravity, mules and rope; rack gauge 30 in. thick.
S of M—Hand.
PP—12 Loco. type return ubular boilers, total 2700 H. P., gen. unit 275 volts D. C., 1 compressor, 7 pumps.
EMP—1324. Last fiscal year output 637,962 tons.

GRAVITY SLOPE—Drift and slope, Archbald and Dunmore Seams, 33 to 60 in. thick.
PO—Archbald, Pa.; SP—Same; CTY—Lackawanna; RR—D. & H.
MF—John J. Kearney, Archbald, Pa.
S of H—3 Steam loco., mules rope and gravity; track gauge 30 in.
S of M—Hand.
PP—4 Stirling water tube boilers, total 1080 H. P., gen. unit 275 volts D. C., 5 pumps.
EMP—963. Last fiscal year output 382,511 tons.

JERMYN MINE; Shaft, Archbald, Grassy Island, Dunmore and New County Seam, 30 to 72 in. thick.
PP—Jermyn, Pa.; SP—Same CTY—Lackawanna RR—D. & H.
MF—A. P. Patten........Jermyn, Pa.
S of H—15 Elec. mach., rope and mules; track gauge 28 in.
S of M—Hand.
PP—4 Wickes water tube, 8 loco. type return tubular boilers, total 2200 H. P., 3 gen. units 275 volts D. C. 1 compressor, 8 pumps.
EMP—833. Last fiscal year output, 407,709 ons.

Legitts Creek Mine—Shaft, Dunmore No. 2, 3, 4, Four Foot, Five Foot, Eight Foot, Diamond, Rock and Fourteen Foot, 30 to 96 in. thick.
PO—Scranton, Pa.; SP—Providence, Pa.; CTY—Lackawanna; RR—D. & H.
MS—Levi Emanuel .....Scranton, Pa.
S of H—19 Comp. air loco., mules, rope and gravity; track gauge 30 in.
S of M—Hand.
PP—8 Stirling water tube boilers, 14 loco. type return tubular boilers, total 3910 H. P.; 11 compressors, 5 pumps.

EMP—874. Last fiscal year output 321,192 tons.

Manville Mine—Shaft; New County, Dunmore No. 2, 3 and 4 Seams; 30 to 48 in. thick.
PO—Scranton, Pa.; SP—Green Ridge, Pa.; CTY—Lackawanna; RR—D. & H.
MS—Jas. J. Thomas....Scranton, Pa.
S of H—Mules, rope and gravity; track gauge 30 in.
S of M—Hand.
PP—4 Loco. type return tubular boilers, total 900 H. P., 3 pumps.
EMP—371. Last fiscal year output 63,153 tons.

MARVINE MINE—Shaft; Dunmore No. 3, 4, Fourteen Foot, Clark, New County and Diamond Seams 32 to 96 in. thick.
PO—Scranton, Pa.; SP—Providence, Pa.; CTY—Lackawanna; RR—D. & H.
MF—Edward F, McGlynn..Scranton, Pa.
S of H—8 Comp. Air; 6 Elec. loco., mules and rope; track gauge 30 in.
S of M—Hand.
PP—2 Stirling, 5 Wicks, water tube boilers, total 2040 H. P.; gen. unit 275 volts D. C., 2 pumps. Power from Olyphant plant.
EMP—948. Last fiscal year output 368,520 tons.

Olyphant Mine—Shaft and Slope, Nos. 1. 2, Four Foot, Diamond, Rock, New County, Fourteen Foot, Clark, Dunmore No. 4 and Upper Four Foot Seams, 20 to 72 in. thick.
PO—Olyphant, Pa.; SP—Same; CTY—Lackawanna; RR—D. & H.
MF—J. H. Pritchard......Olyphant, Pa.
S of H—17 Comp. air, 7 Gasoline loco., mules, rope and gravity; track gauge 30 in.
S of M—Hand.
PP—4 Stirling water tube boilers. toal 1852 H. P.; gen. unit 2300 volts A. C., 3 phase, 25 cycles, 5 compressors, 5 pumps.
EMP—1856. Last fiscal year output 822,666 tons.

Plymouth No. 2 Mine—Shaft, Cooper, Snake Island, Lance Hillman, Stanton, Five Foot, Bennett, Red Ash and Abbott Seams, 52 to 132 in. thick. Operate Washery.
PO—Plymouth, Pa.; SP—Same; CTY—Luzerne; RR—D. & H.
MF—Edward Flynn......Plymouth, Pa.
S of H—Rope, mules and gravity; track gauge 36 in.
S of M—Hand.
PP—11 Loco type return tubular boilers, total 2475 H. P.; 2 gen. units 2300 volts A. C., 3 phase, 60 cycles, 3 compressors, 5 pumps.
EMP—494. Last fiscal year output 186,760 tons.

Plymouth No. 3 Mine—Shaft, Lance, Hillman, Stanton, Five Foot, Bennett, Red Ash and Ross Seams, 30 to 114 in. thick. Operate Washery.
PO—Plymouth, Pa.; SP—Same; CTY—Luzerne; RR—D. & H.
MF—Fred Badman......Plymouth, Pa.
S of H—Rope, mules and gravity; track gauge 36 in.
S of M—Hand.
PP—6 Wicks, water tube boilers, total 1800 H. P., 1 compressor, 1 pump.
EMP—896. Last fiscal year output 486,648 tons.

Plymouth No. 4 Mine—Shaft, Red Ash, Bennett, Ross, (Bennett & Cooper) Seams, 72 to 204 in. thick.
PO—Plymouth, Pa.; SP—Same; CTY—Luzerns; RR—D. & H.
MF—Thomas Coates....Plymouth, Pa.
S of H—Mules, rope and gravity; track gauge 36 in.
S of M—Hand.
PP—21 Cylinder return tubular boilers, total 567 H. P., 2 pumps.
EMP—204.

Plymouth No. 5 Mine—Shaft, Red Ash, Five Foot, Bennett, Cooper and Ross Seams, 36 to 132 in. thick.
PO—Plymouth, Pa.; SP—Came; CTY—Luzerne; RR—D. & H.
MF—Thomas Coates......Plymouth, Pa.
S of H—Hules, rope and gravity.
S of M—Hand.
PP—6 Stirling water tube boilers, 1620 H. P., 1 pump.
EMP—338. Last fiscal year output 453,696 tons.

Powderly Mine—Slope, drift and stripping; Grassy Island, Top, Bottom and Third Seams, 30 to 60 in. thick.
PO—Carbondale, Pa.; SP—Mayfield, Pa.; CTY—Lackawanna; RR—D. & H.
MF—John F. Scott....Carbondale, Pa.
S of H—7 Elec., 2 Steam loco, mules, rope and gravity; tarck gauge 22 and 30 in.
S of M—Hand.
PP—6 Return tubular boilers, total 900 H. P.; gen. units 275 volts D. C., 14 pumps.
EMP—856. Last fiscal year output 428,206 tons.

Von Sorch Mine—Slope, Dunmore Nos. 2, 3, 4, Clark, New County, Fourteen Foot, Five Foot and Rock Seams, 32 to 96 in. thick.
PO—Scranton, Pa.; SP—Green Ridge, Pa.; CTY—Lackawanna; RR—D. & H.
MF—Edward A. Lewis....Scranton, Pa.
S of H—8 Comp. Air, 1 Steam loco., mules, rope and gravity; track gauge 30 in.
S of M—Hand.
PP—1 Stirling water tube boiler, 11 loco. type return tubular boilers, total 2745 H. P., 1 compressor, 3 pumps.
EMP—1269. Last fiscal year output 460,310 tons.

DELAWARE, LACKAWANNA & WESTERN RAILROAD CO.
General Office, 90 West Street, New York, N. Y.
PR—W. H. Truesdale, New York, N.Y.
VP—E. E. Loomis, " "
TR—A. D. Chambers, " "
PA—C. C. Hubbell, " "
EE—H. M. Warren, " "
GM—W. W. Inglis......Scranton, Pa.
EM—Chief S. D. Dimmick, Scranton, Pa.
Eng. of new development work, Wm. Sekol.
Bradford Samson, Supt. of Construction, Scranton, Pa.
Sales Agency, D. L. & W. Coal Co., New York, N. Y.; PR—J. F. Bermingham.

Archbald Mine.
PO—Scranton, Pa., SP—Same; CTY—Lackawanna; RR—D. L. & W.
S of H—9 elec. loco., mules and rope.
S of M—Hand.
PP—4 water tube boilers, total 1212 H. P., 1 gen. unit.,
EMP—965.

Auchincloss Mines.
PO—West Nanticoke, Pa.; SP—Plymouth, Pa.; CTY—Luzerne; RR—D.L.&W.
S of H—8 elec. loco.
PP—3 water tube boilers, total 1500 H. P., gen. unit, 1 comp., 1 pump.
EMP—596.

Avondale Mine.
PO—Chauncey, Pa.; SP—Plymouth, Pa.; CTY—Luzerne; RR—D. L. & W.
S of H—2 elec. loco.
PP—10 boilers, total 1695 H. P., 2 gen. units, 9 pumps.
EMP—440.

Bellevue Mine.
PO—Scranton, Pa.; SP—Same; CTY—Lackawanna; RR—D. L. & W.
S of H—18 elec. loco.
PP—Boiler 100 H. P., 3 gen. units and 7 pumps.
EMP—1054.

Bliss Mines.
PO—West Nanticoke, Pa.; SP— Same; CTY—Luzerne; RR—D. L. & W.
S of H—11 elec. and 1 steam loco.
PP—4 Boilers, total 2000 H. P., 4 gen. unit, 1 comp. and 2 pumps.
EMP—895.

Brisbin Mines.
PO—Scranton, Pa.; SP—Same; CTY—Lackawanna; RR—D. L. & W.
S of H—6 Elec. loco.
PP—3 boilers, total 1250 H. P., 1 gen. unit, 4 pumps.
EMP—779.

Cayuga.
PO—Scranton, Pa.; SP—Same; CTY—Lackawanna: RR—D. L. & W.
S of H—8 elec. loco.
PP—6 boilers, total 1,500 H. P., and 2 pumps.
EMP—448.

Continental Mine.
PO—Scranton, Pa ; SP—Same; CTY—Lackawanna; RR—D. L. & W.
S of H—7 elec. locos.
EMP—638.

Diamond Mine.
PO—Scranton, Pa. SP—Same. CTY—Lackawanna; RR—D. L. & W.
S of H—5 elec. locos.
PP—8 boilers, total 2000 H. P., and 7 pumps.
EMP—1194.

Dodge Mine.
PO—Scranton, Pa.; SP—Same; CTY—Lackawanna; RR—D. L. & W.
S of H—12 elec locos.
PP—10 boilers, total 3,130 H. P., 2 gen. units, and 3 pumps.
EMP—676.

Hallstead Mine.
PO—Duryea, Pa.; SP—Same; CTY—Luzerne; RR—D. L. & W.
PP—11 boilers, total 1990 H. P., 4 pumps.
EMP—476.

Holden Mine.
PO—Taylor, Pa.; SP—Same, CTY—Lackawanna; RR—D. L. & W.
S of H—9 elec. loco.
PP—7 boilers, total 945 H. P., 1 gen. unit and 4 pumps.
EMP—484.

Hyde Park Mine.
PO—Scranton, Pa.; SP—Same; CTY—Lackawanna; RR—D. L. & W.
S of H—15 elec. locos.
PP—1 pump.
EMP—880.

Loomis Mine.
PO—West Nanticoke, Pa.; SP—Same, CTY—Luzerne; RR—D. L. & W.
S of H—9 elec. loco.
PP—3 water tube boilers, total 915 H. P., 1 comp., and 3 pumps.
EMP—437.

Manville Mine.
PO—Scranton, Pa.; SP—Same; CTY—Lackawanna; RR—D. L. & W.
PP—3 pumps.
EMP—460.

National Mine.
PO—Scranton, Pa.; SP—Same; CTY—Lackawanna; RR—D. L. & W.
S of H—11 elec. locos.
PP—4 water tube boilers, total 1212 H.
Pettebone Mine.
PO—Luzerne, Pa.; SP—Same; CTY—Luzerne; RR—D. L. & W.
PP—10 Boilers, total 1,350 H. P., 1 gen. unit and 2 pumps.
P., 2 gen. units, and 4 pumps.
EMP—714.

EMP—450.
Pyne Mines.
PO—Taylor, Pa.; SP—Same; CTY—Lackawanna; RR—D. L. & W.
S of H—12 elec. locos.
PP—5 boilers, total 1515 H. P., and 2 pumps.
EMP—848.

Sloan Mines.
PO—Scranton, Pa.; SP—Same; CTY—Lackawanna; RR—D. L. & W.
S of H—14 elec. locos.
PP—1 gen. unit and 5 pumps.
EMP—1084.

Storrs Mines.
PO—Scranton, Pa.; SP—Same; CTY—Lackawanna; RR—D. L. & W.
S of H—23 elec. locos.
PP—8 boilers, total 2,418 H. P,, 6 gen. units, and 3 pumps.
EMP—1892.

Taylor Mines.
PO—Taylor, Pa.; SP—Same, CTY—Lackawanna. RR—D. L. & W.
S of H—20 elec. locos.
PP—10 boilers, loco. type; total 1300 H. P., 1 gen. unit and 3 pumps.
EMP—850.

Truesdale Mines.
PO—West Nanticoke, Pa.; SP— Same, CTY—Luzerne; RR—D. L. & W.
S of H—38 elec. and 1 steam loco.
PP—6 Boilers, total 1818 H. P., 2 gen. unit, 5 comp. and 7 pumps.
EMP—2,000.

Woodward Mine.
PO—Kingston, Pa.; SP—Same, CTY—Luzerne; RR—D. L. & W.
S of H—22 elec. locos.
PP—8 water tube boilers, total 2504 H. P., 3 loco. type, 450 H. P.
EMP—1,781.

Washeries.
Bellevue, Archbald, Cayuga, Diamond, Hampton, Hyde Park and Storrs.
PO—Scranton, Pa.
EMP—391.
Hampton Central Power Plant, 21 water tube boilers, 8481 H. P.

DODSON COAL CO.

General Office, Bethlehem, Pa.
Morea Colliery, Shaft, Slope and Stripping; Mammoth, Skidmore, Buck Mtn. and 7 ft. Seam, 36 to 900 in. thick.
PO—Morea Colliery, Pa. SP—Morea, Pa. CTY—Schuylkill; RR—P. R.R. and L. V.
PR—Chas. M. Dodson, Bethlehem, Pa.
TR—Josiah Bachman, " "
GM—T. M. Dodson, " "
GS—J. B. Connell....Morea Colliery, Pa.
PA—P. J. Malloy, Morea Colliery, Pa.
MM—H. D. Lattimore, " " "
EE—Thomas Blackwell, " " "
MS—Wm. A. McGinley, " "
S of H—6 Elec. loco., mules, rope and gravity.
S of M—Hand.
PP—22 Return tubular boilers, total 2,200 H.P., 1 gen. unit, 275 volts D. C., 2 air compressors, 5 pumps. also purchase power.
EMP—600. Last fiscal year output 383,000 tons.
Sales Agents, Weston Dodson & Co., Inc., Bethlehem, Pa.

DODSON, CHAS. M. CO.

General Office, Bethlehem, Pa.
Beaver Brook Colliery; Slope and Stripping; Mammoth, Wharton, Buck Mtn., Lykens and Gamma Seam, 24 to 600 in. thick.
PO—Beaver Brook, Pa.; SP—Audenreld, Pa.; CTY—Luzerne RR—L. V. C. R. R. of N. J.
PR—Charles M. Dodson...Bethlehem, Pa.
TR—F. C. Stout, " "
GM—T. M. Dodson, " "
PA—P. J. Malloy....Morea Colliery, Pa.
GS—J. B. Connell....Beaver Brook, Pa.
MM—Frank Mikrantz..Beaver Brook, Pa.
MS—M. Zimmerman, Beaver Brook, Pa
EM—Stephen Long....Beaver Brook, Pa.
EE—Lewis Miller, " "
SCO—Chas. M. Dodson & Co., Buyer, Vincent Larkin, Beaver Brook, Pa.

S of H—Mules, rope, gravity, 2 Elec., 2 Steam, and 1 Gasoline loco.; track gauge 48 in.
S of M—Hand and comp. air machines.
PP—25 Return tubular boilers total 3600 H. P., 19 engines, 1,440 H. P., 2 compressors, 9 pumps.
EMP—750. Sales Agent, Weston Dodson & Co., Inc., Bethlehem, Pa.

DOLPH COAL CO.

General Office, Scranton, Pa.
Dolph Mine; Slope and Drifts; Dunmore Seam, 3 to 8 ft. thick; operate washery.
PO—Jessup, Pa.; SP—Same and Peckville, Pa.; CTY—Lackawanna; RR—Erie.
PR—W. G. Payne......Kingston, Pa.
TR—Isaac P. Hand..Wilkes-Barre, Pa.
GM—W. G. Robertson..Scranton, Pa.
PA—W. G. Robertson, " "
MS—W. G. Robertson, " "
SM—H. C. Lindeman.....Jessup, Pa.
S of H—4 Elec., 3 steam locos. and mules; track gauge 36 in.
S of M—Hand.
PP—8 Water tube, 2 return tubular boilers, total 3000 H. P.
EMP—557.

EAST BEAR RIDGE COAL CO.

Stripping, Mammoth Seam.
PO—Mahanoy City, Pa.; CTY—Schuylkill; RR—P. & R.
GM—David R. James, Shenandoah, Pa.

EAST BEAR RIDGE COLLIERY CO.

Scranton, Pa.
East Bear Ridge Mine; Slope; Drift; Stripping; Mammoth, Top Split; Skidmore; Seven Foot; Buck Mountain & Little Buck Mountain Seams; 48 to 80 in. thick
PO—Mahanoy Plane, Pa.; SP—Same; CTY—Schuylkill; RR—Phila. & Reading.
PR—Samuel G. B. Cook, Baltimore, Md.
TR—G. T. Davis.....u...Scranton, Pa.
GH—G. T. Davis, " "
PA—Jas. H. Pierce, Mahanoy Plane, Pa.
MS—Jas. H. Pierce, " "
EM—Thomas Weller.....Girardville, Pa.
EE—Thomas Guinther....Frackville, Pa.
S of H—Mules, 5 elec. and 2 steam locos. Track gauge 48 in.
S of M—5 comp. air mach. & 1 steam shovel.
PP—1 Keeler water tube boiler. and 7 return tubular boilers, total 1300 H. P., 1 motor generator set, 250 volts D. C., 3 pumps, 1 air comp. Purchase power.
EMP—450. Monthly output 18,000 tons.

EAST BOSTON COAL CO.

East Boston Mine; Shaft; Anthracite Seam. Operate Washery.
PO—Kingston, Pa.; SP—Same and Luzerne, Pa. CTY—Luzerne. RR—D. L. & W., L. V
PR—W. G. Payne........Kingston, Pa.
TR—W. T. Payne, " "
GM—W. T. Payne, " "
PA—W. T. Payne, " "
MS—Peter Henderson......Luzerne, Pa.
EM—Chas. Miles ....Wilkes-Barre, Pa.
EE—H. H. Riley.......Forty Fort, Pa.
S of H—Mules, rope and comp. air; track gauge 28 in.
S of M—Hand and 1steam shovel.
PP—8 Water tube boilers, total 2,000 H.P., 2 gen. units, 500 volts D.C., 6 pumps delivering water to surface and 2 compressors.
EMP—680. Last fiscal year output 175,902 tons.
Sales Agent, W. T. Payne, Kingston, Pa.

EAST LEHIGH COLLIERY CO.

East Lehigh Mine, Slope, Mammoth, Buck Seams. 18 ft. thick.

PO—Tamaqua; SP—Same; CTY—Schuylkill; RR—P. & R. and L. & N. E., Branch.
PR—E. M. B. Shepp......Tamaqua, Pa.
GM—E. M. B. Shepp, " "
GS—J. H. Shepp, " "
PA—J. H. Shepp, " "
SM—J. H. Shepp, " "
MS—D. B. Davis, " "
S of H—Mules.
S of M—Comp. air and hand; 2 compressors, 3 pumps.
PP—3 Return tubular boilers, total 650 H.P.
EMP—175. Last fiscal year output 80,000 tons.
Sales Agent, J. H. Shepp, Tamaqua, Pa.

EASTERN PENNSYLVANIA COAL CO.

Out of business

ELECTRIC COAL CO.

General Office, Peckville, Pa.
Slope Mine; Diamond Vein; 60 to 84 in. thick.
PO—Peckville, Pa.; SP—Olyphant, Pa.; CTY—Lackawanna; RR—N. Y. O. & W.; Erie.
PR—George N. Campbell, Peckville, Pa.
TR—Lewis H. Johns, " "
GS—Lewis H. Johns " "
GM—John B. Burns " "
PA—John B. Burns " "
EM—Frank H. Daggor " "
CE—Frank H. Daggor " "
MS—Lewis H. Johns, " "
S of H—Mules and rope. Track gauge standard.
S of M—2 electric machines.
PP—1 pump; purchase power.
EMP—50. Last fiscal year output, 2000 tons.
Sales Agency, Saxton & Co., Albany N. Y.

ELK BROOK COAL CO.

Elk Brook Colliery Grassy Island, Clark and Dunmore Seams.
CTY—Lackawanna RR—N. Y. O. & W., Scranton Div.
PR—Chas. E. Bradbury..Scranton, Pa.
TR—Chas. E. Bradbury " "
CE—Campbell & Myers,...Pittston, Pa.
EM—H. F. Warner......Scranton, Pa.
Note—Preliminary work began.

ELLSWORTH COAL MINING CO.

Ellsworth Mine; Slope and Stipping; Church, Crosby, Mammoth, Skidmore and Buck Mtn. Seams, 864 to 1,032 in. thick.
PO—Pottsville, Pa.; SP—Minersville, Pa.; CTY—Schuylkill; RR—P. & R.
PR—G. M. Keiser....Minersville, Pa.
GM—G. M. Keiser, " "
PA—G. M. Keiser, " "
GS—G. Jenkins, " "
MS—G. Jenkins, " "
TR—C. D. Norton....Philadelphia, Pa.
S of H—4 Steam loco.; track gauge 36 in.
S o. M—6 Comp. air mach.
PP—4 Return tubular boilers, 2 compressors, 3 pumps.
EMP—200. Last fiscal year output, 100,000 tons.

EMPEROR COAL CO.

Slopes, Primrose Seam 8-10 ft. thick.
PO—Pottsville, Pa.; SP—Same; CTY—Schuylkill.
RR—P. R. R.
PR—Geo. M. Keiser, Minersville, Pa.
GM—Geo. M. Keiser, " "
GS—Geo. M. Keiser, " "
S of H—Steam loco. and mules, Track gauge 36 in.
S of M—Hand.
PP—2 boilers 300 H. P.

ENTERPRISE COAL CO., THE

General Office, Scranton, Pa.
Enterprise Mine, Slope and Shaft. Anthracite Seam, 4½ ft. to 9 ft. thick.
PO—Excelsior, Pa.; PP—Same and Fulton, Pa.; CTY—Northumberland; RR—P. & R., and P. R. R.
PR—W. L. Connell......Scranton, Pa.
TR—H. A. Connell, " "
PA—H. A. Connell, " "
GM—W. L. Connell, " "
SUPT—Edward X Brennan, " "
MS—Edward X. Brennan..Excelsior, Pa.
MM—Geo. W. Horne, " "
EE—Henry Swisher, " "
SCO—The Anthracite Store Co., Buyer, Jas. J. Holland, Excelsior, Pa.
S of H—5 Elec. loco. and mules; track gauge 44 in.
S of M—Hand.
PP—10 Water tube boilers, total 2,500 H. P., 3 gen. units, 250 volts D. C., 4 pumps.
EMP—244. Last fiscal year output 103,355 tons.
Sales Agent, P. & R., C. & I. Co.

EVANS COLLIERY CO.

Evans Mine; Slope; Buck Mtn., Upper and Lower Gamma Seam, 72 to 180 in. thick.
PO—Beaver Meadows, Pa.; SP—Same; CTY—Carbon; RR—Lehigh Valley.
TR—Gwillyn Edwards......Luzerne, Pa.
GM—A. Fred Bredbenner, Beaver Meadows, Pa.
PA—A. Fred Bredbenner, Beaver Meadows, Pa.
MS—Timothy Ryan.......Hazlton, Pa.
MM—Jas. Gildea.........Treskow, Pa.
S of H—Mules and rope; track gauge 30 in.
S of M—Hand.
PP—2 Sterling water tube boilers, 700 H. P., 4 pumps. Purchase power.
EMP—135. Last fiscal year output 28,000 tons.
Sales Agent, East Boston Coal Co., Kingston, Pa.

EXCELSIOR COAL CO.

Corbin Mine; Slope.
PO—Shamokin, Pa.; SP—Same; CTY—Northumberland; RR—P. & R.
GS—Geo. W. Robertson....Shamokin, Pa.
MS—Geo. W. Robertson..Shamokin, Pa.
S of H—4 Elec. loco. and mules.
PP—32 boilers, 1172 H. P., 3 pumps.
EMP—565. Last fiscal year output 215,365 tons.

FALLBROOK COAL CO. (Est. John Murrin)

Fallbrook Colliery, Drift, Clark Seam, 7 to 15 ft. thick.
PO—Carbondale, Pa. SP—Same. CTY—Lackawanna; RR—O. & W.
GM—Frank Murrin ....Carbondale, Pa.
MS—Frank Murrin......Carbondale, Pa.
PA—John Murrin, " "
S of H—Mules and 1 Steam loco.; track gauge 30 in.
S of M—Hand.
PP—Boiler, 150 H. P.
EMP—32. Last fiscal year output 10,680 tons.

FIRESIDE COAL COMPANY

General Office, Heart Lake, Jermyn, Pa.
Fire Side Mine; Drift; Clark Vein; 84 to 108 in. thick.
PO—Jermyn, Pa.; SP—Same; CTY—Lackawanna; RR—N. Y. O. & W.
PR—John A. Komara, Heart Lake, Jermyn, Pa.
GM—John A. Komara, Heart Lake, Jermyn, Pa.
PA—John A. Komara, Heart Lake, Jermyn, Pa.
S of H—Mules and 3 steam locos. Track gauge 34 in.
S of M—Hand.
PP—1 water tube boiler, total 150 H. P.
EMP—65.

GIRARD MAMMOTH COAL CO.

Girard Mammoth Mine, Slope, Drifts and Strippings, Mammoth and Buck Mtn, Seam 180 to 264 in. thick.
PO—Raven Run, Pa.; SP—Girardville and Shenandoah, Pa.; CTY—Schuylkill; RR—P. & R. and L.V.
PR—Timothy Cockill, Mahanoy City, Pa.
TR—Timothy Cockill, " " "
PA—Timothy Cockill, " " "
MS—William Palmer, " " "
EM—Wm. S. Pugh......Pottsville, Pa.
EE—V. Dougherty.....Raven Run, Pa.
S of H—Mules, 3 elec. and 13 steam loco. Track gauge 30, 40, 48 in.
S of M—Hand.
PP—5 water tube and 4 return tubular boilers, total 1,750 H. P., 1 gen. unit, 175 volts D. C., 5 pumps.
EMP—388. Last fiscal year output 194,702 tons.
Sales Agencies, H. H. Lineweaver & Co., Inc., Philadelphia, Pa., and Evans Coal Co., Fort Wayne, Ind.

GORMAN & CAMPION

General Office, Mahanoy City, Pa.
Bell Mine; Drift; Mammoth Seam, 432 to 1152 in. thick.
Seam 36 to 96 ft. Thick.
PO—Tuscarora, Pa.; SP—Same; CTY—Schuylkill; RR—P. & R.
PR—Patrick J. Campion, Mahonoy Cit,y Pa.
GM—Daniel I. Slattery,...Tuscarora, Pa.
PA—Daniel I. Slattery, " "
GS—Daniel I. Slattery, " "
MS—John J. Kane " "
SCO—Slattery Bros., Tuscarora, Pa., Buyer, Daniel I. Slattery.
S of H—Mules; track gauge 40 in.
S of M—Hand.
PP—2 Heine Water tube boilers, 350 H. P., and 1 compressor.
EMP—50. Last fiscal year output 16,000 tons.
Sales Agents, Slattery Bros., Phila., Pa.

GREENOUGH RED ASH COAL CO.

General Office, Shamokin, Pa.
Greenough Colliery, Shaft, Slope and Drift.
PO—Keiser, Pa.; SP—Mt. Carmel, Pa.; CTY—Northumberland; RR—P. R. R.
PR—M. W. O'Boyle .. Pittston, Pa.
TR—Geo. C. Graeber....Shamokin, Pa.
GM—Edward Brennan, " "
GS—Edward Brennan, " "
PA—F. A. Gable, " "
S of H—Mules, rope 4 elec. and 1 gasoline loco. Track gauge 44 ins.
S of M—Hand.
PP—12 return tubular boilers, total 2000 H. P., 2 gen. units, 500 volts D. C., 1 compressor, 3 pumps.
EMP—605. Last fiscal year output 255,392 tons.

GREEN RIDGE COAL CO.

Green Ride Colliery, Slope, Clark and Dunmore Seam, 3 to 4½ ft. thick.
PO—Scranton, Pa. SP—Same. CTY—Lackawanna. RR—Erie.
PR—W. L. Connell, .. Scranton, Pa.
GM—W. L. Connell, " "
TR—H. A. Connell, " "
PA—H. A. Connell, " "
MS—A. L. Griffen, " "
EM—C. S. Motiska, " "
MM—Thomas Burrier, " "
S of H—Mules, rope and elec. Track gauge 36 in.
S of M—Hand.
PP—6 water tube, National boilers, total 750 H. P. Also power purchased. 1 pump.
EMP—182. Last fiscal year output 61,860.06 tons. Sales agency, Williams & Peters No. 1, Broadway, New York, N. Y.

HADDOCK MINING CO.

General Office, Wilkes-Barre, Pa.
Black Diamond Mine; Shaft.
PO—Luzerne, Pa.; SP—Same; CTY—Luzerne; RR—L. V., D. L. & W.
PR—Carleton C. Jones, Wilkes-Barre, Pa.
TR—John C. Haddock, " "
PA—John C. Haddock, " "
GS—Gilbert S. Jones, . . Dorrance.ton, Pa.
EM—Smith & Wells, " " "
SCO—Haddock Supply Co., Luzerne, Pa.
S of H—1 Elec. loco., mules and rope
S of M—Hand.
PP—3 Water. 12 return tubular boilers, total 2,600 H. P., 3 compressors. 5 pumps. Power purchased.
EMP—550. Last fiscal year output 191,652 tons.
Formerly the Black Diamond Mine of the Plymouth Coal Co.

HARLEIGH-BROOKWOOD COAL CO.

Stanton, Lawrance and West Bear Ridge Mines; Slopes; Skidmore, Buck Mtn., Mammoth and Holmes Seams.
PO—Mahanoy Plane, Pa.; SP—Same; CTY—Schuylkill; RR—P. & R.
PR—Percy C. Madeira, Philadelphia, Pa.
TR—Louis C. Madeira, " "
GM—W. G. Thomas. . . . .Frackville, Pa.
PA—Geo. R. Wunderlick. " "
MM—Frank Moyer and George Birklebach, Frackville, Pa.
S of H—3 Elec. loco. and mules; track gauge 36 in.
S of M—Hand.
PP—6 Return tubular boilers,, 3 air compressors and 5 pumps.
EMP—1,200: Sales Agent, Madeira, Hill & Co., Philadelphia, Pa.

HARWOOD COAL CO.

General Office, 437 Chestnut St., Philadelphia, Pa.
Harwood Mine; Slope; Four Foot Wharton Gamma. Buck Mtn. Seam, 36 to 324 in. thick. Operate washery.
PO—Harwood Mines, Pa.; SP—Same; CTY—Luzerne; RR—Lehigh Valley.
PR—S. D. Warriner. . . .Philadelphia, Pa.
VP—E. Ludlow. . . . . .Lansford, Pa.
VP—H. F. Baker. . . . . .Philadelphia, Pa.
VP—Rollin H. Wilbur, " "
SECY—H. H. Pease, " "
TR—H. H. Pease, " "
PA—E. Hughes, " "
MGR—Hugh M. Crankshaw, Harwood Mines, Pa.
MS—J. Panco, " "
MM—John Beach, " "
SCO—Harwood Store Co., Harwood Pa.,
Buyer, Chas. R. Williams. Harwood, Pa.
S of H—Mules, Elec and 3 Steam loco; track gauge 48 in.
S of M—Hand.
PP—1 compressor and 10 pumps. Buy Elec. and Steam power.
EMP 500. Last fiscal year output, 236.837 tons.
Sales Agent, Swain Bros., Philadelphia, Pa.; Whitney & Kemmerer, New York, N. Y.

HAZLE MOUNTAIN COAL CO.

Hazle Mountain Mine, Slope, Mammoth, Seam 10 to 20 ft. thick.
PO—Hazleton, Pa.; SP—Conygham; CTY—Luzerne; RR—Lehigh Val.
PR—W. R. McTurk. . .Philadelphia, Pa.
GM—Morton H. McTurk, Hazleton, Pa.
PA—Morton H. McTurk, " "
MS—J. J. Turnbach. . . . . .Hazleton, Pa.
S of H—Mules and steam loco.; track gauge 36 in.
S of M. .Hand and compressed air.
PP—4 Water tube, and 4 return tubular boilers, total 1,500 H.P., 2 air compressors, 5 pumps.
Sales Agents, W. R. McTurk & Co., Philadelphia, Pa.
(Old information.)

HILLSIDE COAL & IRON CO.

General Office, 50 Church St., New York, N. Y.
PA—W. R. Collins. . . .New York, N. Y.
PR—W. A. May. . . . . .Scranton, Pa.
TR—F. H. Wright. " "
CE—Alexander Bryden, " "
EM—C. W. F. Neuffer, " "
EE—M. C. Walthall, " "
GS—J. P. Jennings, " "
GS—W. P. Jennings, " "
Sales Agent, Williams & Peters, No. 1 Broadway, New York, N. Y.

Forest City Mine, Shaft and Slope.
PO—Forest City, Pa. SP—Same. CTY—Susquehanna. RR—Erie.
MS—H. E. Yewens, . . Forest City, Pa.
S of H—16 elec., 5 steam locos, gravity and mules.
S of M—Hand.
PP—28 return tubular boilers, total 3,450 H. P., gen. units, 275 volts D. C., 6 pumps.
EMP—1,365. Last fiscal year output 515,637 tons.

Erie Mine, Shaft, Marcy and Clark Seams.
PO—Mayfield, Pa. SP—Same. CTY—Lackawanna. RR—Erie.
MS—H. E. Yewens, . . Forest City, Pa.
S of H—2 Elec., 3 steam locos., gravity and mules.
S of M—Hand.
PP—12 return tubular boilers, total 1,185 H. P., gen. units 300 K. W., 275 volts D.C., 1 compressor, 9 pumps.
EMP—338. Last fiscal year output 159,873 tons.

Butler Mine, Slopes and shaft, Pittston, Marcy and Red Ash Seams.
PO—Pittston, Pa. SP—Same. CTY—Luzerne. RR—Erie.
MS—David Grivin. . . . . . .Pittston, Pa.
S of H—23 elec., 9 steam locos., gravity and mules.
S of M—Hand.
PP—22 return tubular boilers, total 3,300 H. P., gen. units, 220 volts A. C., 670 K. W., 275 volts D. C., 6 pumps.
EMP—1,483. Last fiscal year output 636,675 tons.

Consolidated Mine, Slope and shaft, Clark and Red Ash Seams.
PO—Avoca, Pa. SP—Same. CTY—Luzerne. RR—Erie.
S of H—2 steam locos., gravity and mules.
S of M—Hand.
PP—8 return tubular boilers, total 800 H.P., gen. unit 275 volts D.C., 1 pump.
EMP—376. Last fiscal year output 149,352 tons.

HUDSON COAL CO. (THE)

General Office, Scranton, Pa.
PR—L. F. Loree. . . . . .New York, N. Y.
VP—(In charge of operations) W. H. Williams. . . .New York, N. Y.
TR—Talbot Olyphant, " "
Asst. Supt.—Chas. Dorrance, Scranton, Pa.
PA—A. M. Fine, " "
Efficiency Eng.—A. E. Lister, Scranton, Pa.
Sales Agency, The Hudson Coal Co.

Clinton Mine—Slope, Grassy Island, Top. Bottom and Clifford Seams, 24 to 72 in. thick. Operate Washery.
PO—Vandling, Pa.; SP—Carbondale, Pa.; CTY—Lackawanna; RR—D. & H.
MF—Fred Smith. . . . . .Vandling, Pa.
S of H—3 Steam and 1 Elec. loco., mules, rope and gravity; track gauge 30 in.
S of M—Hand.
PP—4 Stirling, 1 loco type boilers, total 1205 H. P.; gen. units 275 D. C., 440 volts A. C., 3 phase, 60 cycles, 7 pumps.
EMP—804. Last fiscal year output 446,232 tons.

Clinton Washery.
PO—Vandling, Pa.; SP—Carbondale, Pa.; CTY—Wayne and Lackawanna; RR—D. & H.
MF—Adolph Arnold. . . . . .Vandling, Pa.
PP—Power from Coal Brook Mine.
EMP—5. Last fiscal year output 33,950 tons.

Greenwood Mine—Shaft, Checker, Dunmore Nos. 2 an d3, and New County Seams, 30 to 48 in. thick. Operate Washery.
PO—Minooka, Pa.; SP—Same; CTY—Lackawanna RR—D. & H.
MF—T. R. Loverling. . . .Minooka, Pa.
S of H—4 Steam loco., mules, rope and gravity; track gauge 36 in.
S of M—Hand.
PP—11 Cylinder type, 6 loco. type return ubular boilers, total 2060 H. P., 1 gen. units 2300 volts A. C., 2 compressors, 9 pumps.
EMP—861. Last fiscal year output 283,468 tons.

Greenwood Washery.
PO—Minooka, Pa.; SP—Same; CTY—Lackawanna; RR—D. & H.
MFThos. R. Loverling. . . .Minooka, Pa.
EMP—14.

Jermyn Washery.
PO—Jermyn, Pa.; SP—Same; CTY—Lackawanna; RR—D. & H.
MF—James A. O'Malley. . . .Jermyn, Pa.
EMP—31. Last fiscal year output, 21,540 tons.

Laflin Mine—Shaft, Marcy and Red Ash Seam, 30 to 36 in. thick.
PO—Laflin, Pa.; SP—Same; CTY—Luzerne; RR—D. & H.
MF—O. M. Hobbs. . . . . .Laflin, Pa.
S of H—1 Steam loco., mules, rope and gravity; track gauge 36 in.
S of M—Hand.
PP—9 Return tubular boilers, total 1090 H. P., 2 compressors, 2 pumps.
EMP—579. Last fiscal year output 201,116 tons.

Langcliffe Mine—Shaft, Stark, Red Ash, and Checker Seams, 36 to 72 in. thick. Operate Washery.
PO—Avoca, Pa.; SP—Same; CTY—Luzerne; RR—D. & H.
MF—M. C. Holloran. . . . . . . .Avoca, Pa.
S of H—Mules, rope and gravity track gauge 36 in.
S of M—Hand.
PP—4 Return tubular boilers, total 735 H. P., 1 compressor, 4 pumps.
EMP—293. Last fiscal year output 118,980 tons.

Leggitts Creek Washery.
PO—Scranton, Pa.; SP—Providence, Pa.; CTY—Lackawanna. RR—D. & H.
MF—James Allan. . . . . . . .Scranton, Pa.
EMP—22.

Marvine Washery.
PO—Scranton, Pa.; SP—Providence, Pa.; CTY—Lackawanna; RR—D. & H.
MF—George B. Nicol. . . . . .Scranton, Pa.
PP—2 Stirling water tube boilers, total 540 H. P.
EMP—31. Last fiscal year output [illegible],048 tons.

Pine Ridge Mine—Shaft, Kidney, Rock, Hillman, Cooper, Bennett, Checker, Ross, Three Foot and Red Ash Seams, 24 to 96 in. thick. Operate Washery.
PO—Parsons, Pa.; SP—Same; CTY—Luzerne; RR—D. & H.
MF—Wilson Smith. . . . . . . .Parsons, Pa.
S of H—12 Elec. loco., mules, rope and gravity.
S of M—Hand.
PP—6 Stirling water tube boilers, total 2778 H. P., gen. unit 275 volts D. C., 2 compressors, 4 pumps. Power from Baltimore Mine Elec. plant.
EMP—1207. Last fiscal year output 507,377 tons.

Plymouth No. 2 Washery.
PO—Plymouth, Pa.; SP—Same; CTY—Luzerne; RR—D. & H.
MF—W. E. Steever. . . . . .Plymouth, Pa.
EMP—25. Last fiscal year output 967 tons.

Plymouth No. 3 Washery.
PO—Plymouth, Pa.; SP—Same; CTY—Luzerne; RR—D. & H.
MF—John D. Grimes. . . . .Plymouth, Pa.
EMP—30. Last fiscal year output 26,311 tons.

Plymouth No. 5 Washery.
PO—Plymouth, Pa.; SP—Same CTY—Luzerne; RR—D. & H.
MF—James H. Becker. . . .Plymouth, Pa
EMP—35.

Von Storch Washery.
PO—Scranton, Pa.; SP—Green Ridge, Pa.; CTY—Lackawanna; RR—D. & H.
MF—L. A. Reese. . . . . . . .Scranton, Pa.
EMP—40. Last fiscal year output 17,905 tons.

HUMBERT COAL COMPANY.

Sunnyside Mine, Drift, Dunsmore & Clark Seam, 24 and 72 in. thick.
PO—Jessup, Pa. SP—Same. CTY—Lackawanna. RR—Erie., Sunnyside Switch.
PR—J. J. C. Humbert, Madison, N. J.
TR—W. C. Humbert . . . . . .Jessup, Pa.
GM—W. C. Humber. . . . . . . .Jessup, Pa.
GS—M. S. Loftus, " "
PA—B. R. Davis. . . . . .Jessup, Pa.
EM—T. J. Richards, . .Scranton, "
S of H—Mules and 2 steam locos. Track gauge 36 in.
S of M—Hand.
PP—3 return tubular boilers, total 250 H. P.
EMP—110. Last fiscal year output 9,308 tons. (Idle 7 months).
Sales agent, E. W. Swingle, Peckville, Pa.

JERMYN & COMPANY.

Jermyn No. 1 Mine, three Shafts, three Slopes, "Dunmore" Seam, 16 to 48 in. thick. Operate washery.
PO—Rendham, Pa. SP—Taylor, Pa., and Moosic, Pa.; CTY—Lackawanna. RR—D. L. & W., Erie, Lehigh Valley.
PR—J. J. Jermyn. . . . . . . .Scranton, Pa.
TR—J. J. Jermyn, " "
GM—J. J. Jermyn, " "
GS—E. B. Jermyn, " "
EM—Leon Whaite, " "
PA—Geo. H. Johns. . . . . .Rendham, Pa.
SCO—Rendham Store Co., " "
Buyer, H. H. Henshal, " "
MS John P. Corcoran. .Old Forge, Pa.
S of H—Mules, rope and 1 gasoline locomotive.
S of M—Hand.
PP—4 water tube boilers, total 2,000 H. P., 1 air comp., 2 pumps.
EMP—885. Last fiscal year output 450,000 tons.

KEMMERER, M. S. & CO.

Sandy Run Mine, Slope.
PO—Sandy Run, Pa SP—Same. CTY—Luzerne. RR—C. R. R. of N. J.
PR—M. S. Kemmerer, Sandy Run, Pa.
GM—M. S. Kemmerer, " "
GS—J. P. Powell, " "
PA—J. P. Powell, " "
SM—J. P. Powell, " "
MM—John Hauze, " "
S of H—1 steam loco. and mules.
S of M—Hand.
PP—4 boilers, total 780 H. P.
EMP—281.

KINGSTON COAL CO. THE

PR—W. B. Chamberlain Torresdale, Philadelphia, Pa.
TR—E. W. Dwight, 407 Samson St., " "
GM—F. E. Zerbey, ... Kingston, "
GS—F. E. Zerbey, " "
PA—F. E. Zerbey, " "
EM—G. O. Willits, " "
MM—E. L. Solomon, " "
EE—W. H. Bradbury, " "

No. 4 Colliery, Shafts, Slopes and Tunnels, various Seams, 2 to 12 ft. thick.
PO—Kingston, Pa. SP—Same. CTY—Luzerne. RR—D. & H., P. R. R., D. L. & W., L. V.
MS—T. H. Williams, . .Kingston, Pa.
S of H—Mules, rope, 1 Steam and 4 Elec. loco.; track gauge 36 in.
S of M—Hand.
PP—12 B. & W. water tube and 2 return tubular boilers, total 3,900 tons, 3 gen. units 250 volts D. C., 1 compressor, 6 pumps. 5 pumps.
EMP—1135. Last fiscal year output 552,424 tons.

No. 2 Colliery, Shafts, Slopes and Tunnels, various Seams, 5 to 12 ft. thick.
PO—Kingston, Pa. SP—Same. CTY—Luzerne. RR—D. H. & P. R. R., D. L. & W., L. V.
MS—T. H. Williams, Kingston, Pa.
S of H—Mules, rope, 7 steam and 4 Elec. loco.; track gauge 36 in.
S of M—Hand.
PP—6 B. & W. water tube and 3 return tubular boilers, total 2,250 H. P., 1 pump.
EMP—1,290. Last fiscal year output 648,059 tons.

Gaylord Colliery, Shaft and Slope, various Seams, 2 to 12 ft. thick.
PO—Plymouth, Pa. SP—Same. CTY—Luzerne. RR—D. & H., P. R. R., D. L. & W.
MS—R. A. Smith, . . Plymouth, Pa.
S of H—2 Elec. loco. and mules; track gauge 36 in.
S of M—Hand.
PP—4 B. & W. boilers, total 1,200 H. P., 1 gen. unit 250 volts D. C. 1 Cross compound air compressor, 2 pumps.
EMP—392. Last fiscal year output 194,524 tons.

KOMARA COAL COMPANY

General Office, Heart Lake, Jermyn, Pa.
Summitt Mine; Drift; No. 2 Dunmore Seam; 36 in. thick.
PO—North Scranton, Pa.; SP—Same; CTY—Lackawanna; RR—D. L. & W.
PR—John A. Komara, Heart Lake, Jermyn, Pa.
GM—John A. Komara, Heart Lake, Jermyn, Pa.
PA—John A. Komara, Heart Lake, Jermyn, Pa.
S of H—Mules.
S of M—Hand.
PP—Purchase power.
EMP—25.

LEE, GEORGE F., COAL CO.

General Office, 1200-04 Miners Bank. Wilkes-Barre, Pa.
Chauncey Mine, Slope, Drift and Stripping, Red Ash Seam, 21 to 27 ft thick.
PO—Plymouth, Pa.; SP—Same. CTY—Luzerne; RR—D. L. & W.. Bloomsburg, Div.
PR—N. W. Martz. . . . . .Plymouth, Pa.
TR—George F. Lee, " "
GM—George F. Lee, " "
GS—George F. Lee, " "
PA—Evans H. Jones, " "
MS—Benjamin J. Amos, " "
CE—Chas. A. Miles. . . .Wilkes-Barre, Pa.
SCO—George F. Lee & Co., Buyer, N. W. Martz.
S of H—Mules, rope, 2 Steam loco. and gravity; track gauge 42 in.
S of M—Hand.
PP—5 Water tube boilers.
EMP—356. Last fiscal year output 125.512 gross tons.

LEHIGH COAL & NAVIGATION CO.
General Office, 437 Chestnut St., Philadelphia, Pa.
PR—S. D. Warriner....Philadelphia, Pa.
TR—H. H. Pease, " "
VP—R. H. Wilbur, " "
VP—H. F. Baker " "
Secy—H. H. Pease " "
Asst Secy—Henry Lodge, " "
Asst Secy—R. V. Pierce, " "
Compt—E. M. Reynolds, " "
Asst Compt—J. C. Campbell, Philadelphia, Pa.
PA—E. Hughes, " "
Asst PA—J. R. Bennington, " "
Real Estate Agent—J. L. Sone, Philadelphia, Pa.
VP—E. Ludlow..........Lansford, Pa.
Asst VP—E. H. Suender....Lansford, Pa.
MS—W. G. Wilden, " "
Chief Eng—J. B. Warriner, " "
MM—R. E. Hobart, " "
Supt. of Preparation—A. Leonarz, Lansford, Pa.
Gen Sales Agt—R. T. Davies, Philadelphia, Pa.
Asst Sales Agent—C. H. Dayton, Philadelphia, Pa

Nesquehoning, Shafts, slopes, drifts and strippings, 3 to 50 ft. thick.
PO—Nesquehoning, Pa. SP—Same. CTY—Carbon. RR—C. R. R. of N. J. and L. & N. E.
DS—F. B. Nold, ... Lansford, Pa.
S of H—14 elec., 11 steam locos., rope and mules. Track gauge 42 in.
S of M—Hand and comp. air.
PP—19 water tube, Sterling and B. & W. boilers, total 3,774 H. P., 1 comp. and 1 pump.
EMP—1,799. Last fiscal year output 875,915 tons.

Lansford Mine, Shafts, slopes and drifts, Seams 3 to 50 ft. thick.
PO—Lansford, Pa. SP—Same. CTY—Carbon. RR—L. & N. E.
DS—M. O. Morgans......Lansford, Pa.
S of H—21 elec. 9 steam locos., mules and rope. Track gauge 42 in.
S of M—Hand and comp. air mach.
PP—34 water tube, Sterling boilers, total 7,232 H. P., 4 compressors and 1 pump.
EMP—2,319. Last fiscal year output 1,001,659.17 tons.

Coaldale, Shaft, slope, drift and stripping Seams, 3 to 50 ft. thick. Operate washery.
PO—Coaldale, Pa. SP—Same. CTY—Schuylkill. RR—L. & N. E.
DS—E. J. Jones.......Lansford, Pa.
S of H—12 elec., 9 steam locos., rope and mules. Track gauge 42 in.
S of M—Hand and comp. air mach.
PP—28 water tube Sterling boilers, total 5,448 H. P., 4 compressors.
EMP—1,533. Last fiscal year output 795,645 tons. Washery. 87,286 tons.

Greenwood, Shaft, slope, drift and stripping Seams, 3 to 60 ft. thick. Operate washery.
PO—Seek, Pa. SP—Same. CTY—Schuylkill. RR—L. & N. E.
DS—T. J. Jenkins, .. Lansford, Pa.
S of H—8 elec. and 3 steam locos., rope and mules. Track gauge 42 in.
S of M—Hand and comp. air.
PP—16 water tube Sterling B. & W. boilers, total 4,800 H. P., 1 compressor.
EMP—1,085. Last fiscal year output 406,198 tons. Washery, 10,073 tons.

Rahn, Shaft and Stripping, Seam 3 to 30 ft. thick.
PO—Seek, Pa. SP—Same. CTY—Schuylkill. RR—L. & N. E.
DS—T. J. Jenkins, ... Lansford, Pa.
S of H—7 Elec and 1 Steam loco.; track gauge 42 in.
S of M—Hand and comp. air.
PP—1 comp. and 1 pump.
EMP—854. Last fiscal year output 426,421 tons.

Tamaqua Mine, Shaft, Seams 3 to 30 ft. thick.
PO—Tamaqua, Pa. SP—Same. CTY—Schuylkill. RR—L. & N. E.
DS—T. J. Jenkins........Tamaqua, Pa.
S of H—6 elec., 2 steam locos., mules and rope. Track gauge 42 in.
S of M—Hand and comp. air.
PP—10 water tube Sterling boilers, total 2,700 H. P., 3 compressors.
EMP—760. Last fiscal year output 396,823 tons.

LEHIGH VALLEY COAL CO.
General Office, Wilkesbarre, Pa.
PA—L. Silvermail, 143 Liberty St., New York, N. Y.
GM—F. M. Chase.....Wilkes-Barre, Pa.
GS—Thomas Thomas, " "
EM—H. S. Montz, " "
MM—Paul Sterling, " "
EE—E. B. Wagner,...Wilkes-Barre, Pa.
DS—William Reidelhuber, " "
Supt. of Drifton Shaps—Wm. Campbell, Wilkes-Barre, Pa.
Chief Eng—John H. Humphrey, Wilkes-Barre, Pa.
Efficiency Eng—John Lloyd, Wilkes-Barre, Pa.

Mineral Spring and Heidelburg No. 1. Mines, Shaft and Drift. RR—L. V.
S fo H—2 steam locos. and mules.
S of M—Hand.
PP—18 boilers, total 2,800 H. P., 8 pumps.

Exeter, Maltby and Westmoreland Mines, Shafts. RR—L. V.
S of H—6 comp. air, 9 elec. and 2 steam locos., mules.
S of M—Hand.
PP—20 boilers, total 4,812 H. P., 18 pumps, 1 air comp.

Dorrance, Franklin and Prospect Mines, Slope. RR—L. V.
S of H—2 comp. air, 14 elec. and 14 steam locos., mules.
S of M—Hand.
PP—44 boilers, total 9,400 H. P., 11 air comp., 13 pumps.

Hazelton No. 1, Hazelton Shaft and Spring Mt. & Spring Brook Mines, Shaft and slope, RR—L. V.
S of H—14 elec. and 9 steam locos. and mules.
S of M—Hand.
PP—58 boilers, total 9,220 H. P., 1 air comp., 21 pumps.

Primrose and Park No. 2 Mines, Slope. RR—L. V.
S of H—5 elec. and 6 steam locos. and mules.
PP—29 boilers, total 6,550 H. P., 2 air comp., 8 pumps.

Packer Nos. 2, 3 and 4 Mines, Slope. RR—L. V.
S of H—7 elec. and 5 steam locos., mules.
S of M—Hand.
PP—20 boilers, total 4,200 H. P., 8 pumps.

Centralia and Packer No. 5 Mines, Slope and Shaft. RR—L. V.
S of H—13 elec. and 4 steam locos. and mules.
S of M—Hand.
PP—39 return tubular boilers, total 4,455 H. P., 1 air comp., 3 pumps.

Sayre Mine, Shaft and Slope. RR—L. V.
S of H—6 elec. and 4 steam locos and mules.
S of M—Hand
PP—13 boilers, total 2,900 H. P., 1 air comp., 7 pumps.

Blackwood and Buck Mountain Mines. RR—L. V.
S of H—5 elec. and 4 steam locos. and mules.
S of M—Hand
PP—33 boilers, total 3,755 H. P., 2 air comp., 6 pumps.

Stevens Mine.
RR—L. V.
S of H—2 elec. locos.
S of M—Hand.
PP—8 boilers, total 1,475 H. P., 3 pumps.

Drifton Mine.
CTY—Luzerne.
S of H—4 comp. air and 7 steam loco.
PP—22 boilers, total 4,950 H. P., 3 pumps.
EMP—594. Last fiscal year output 313,645 tons.

Deringer, Gowen and Tomhicken Mines.
CTY—Luzerne.
S of H—2 comp. air, 7 steam loco.
PP—14 boilers, total 2,575 H. P., 3 compressors, 6 pumps.

Oneida Colliery.
CTY—Schuylkill.
S of H—3 comp. air, 3 steam loco.
PP—23 boilers, total 3,800 H. P., 5 compressors, 7 pumps.

Beaver Meadow Mine.
CTY—Carbon.
S of H—4 steam, 2 comp. air loco.
PP—8 boilers, total 2,000 H. P., 2 compressors, 1 pump.

Eckley Mine.
CTY—Luzerne.
S of H—4 steam loco.
PP—13 boilers, total 1,850 H. P., 15 engines, 1 pump.

LEHIGH & WILKES-BARRE COAL CO.
General Office, Wilkes-Barre, Pa.
PR—C. F. Huber....Wilkes-Barre, Pa.
PA—E. S. Kirkuff.....Wilkes-Barre, Pa.
TR—G. O. Waterman.New York, N.Y.
GS—E. J. Newbaker..Wilkes-Barre, Pa.
EM—D. Bunting, " "
Mech Eng—J. H. Doughty, " "
Sales agent, P. B. Heilner, New York, N. Y.

Hollenback No. 2 Mine, Shaft and Slope.
PO—Wilkes-Barre, Pa. SP—Same. CTY—Luzerne. RR—C. R. R. of N. J.
MF—T. B. Robinson (Outside), Wilkes-Barre, Pa.; D. J. Thomas (Inside) Wilkes-Barre, Pa.
S of H—Mules, rope, 1 comp. air and 1 steam loco. Track gauge 30 in.
S of M—Hand and comp. air machines.
PP—8 return tubular boilers, total 2,000 H. P., 3 air compressors, 1 pump.
EMP—902. Last fiscal year output 392,940 tons.

South Wilkes-Barre No. 5 Mine, Shaft.
PO—Wilkes-Barre, Pa. SP—Same. CTY—Luzerne. RR—C. R. R. of N. J.
ME—M. A. Horan, (Outside), Wilkes-Barre, Pa. F. W. Seymour, (Inside), Wilkes-Barre, Pa.
S of H—Mules, rope. 5 comp. air and 1 steam loco. Track gauge 36 in.
S of M—Hand and comp. air machines.
PP—12 Return tubular boilers, total 2,500 H. P., 6 air compressors, 2 pumps.
EMP—1,297. Last fiscal year output 589,254 tons.

Stanton No. 7 Mine, Shaft and Slopes.
PO—Wilkes-Barre, Pa. SP—Same. CTY—Luzerne. RR—C. R. R. of N. J.
MF—T. C. Carr, (Outside), Wilkes-Barre, Pa. T. R. Gambold, (Inside), Wilkes-Barre, Pa. T. D. Evans, (Inside), Wilkes-Barre, Pa.
S of H—Mules, rope, 4 comp. air and 2 steam locos. Track gauge 36 in.
S of M—Hand and comp. air mach.
PP—18 return tubular boilers, total 3,222 H. P., 3 air compressors, 3 pumps.
EMP—1,457. Last fiscal year output 632,734 tons.

Sugar Notch No. 9 Mine, Shaft and Drift
PO—Sugar Notch, Pa.; SP—Same; CTY—Luzerne. RR—C. R. R. of N.J.
MF—T. J. Owens (Outside), Sugar-Notch, Pa. J. R. Morris, (Inside), Sugar-Notch, Pa.
S of H—Mules, rope and 1 steam loco. Track gauge 28 in.
S of M—Hand and comp. air mach.
PP—6 return tubular boilers, total 1,500 H. P., 2 air comp. 3 pumps.
EMP—700. Last fiscal year output 319,130 tons.

Lance No. 11 Mine, Shaft.
PO—Plymouth, Pa. SP—Same. CTY—Luzerne. RR—C. R. R. of N.J.
MF—A. Ashton, (Outside), Plymouth, Pa. D. B. Lewis, (Inside), Plymouth, Pa.
S of H—Mules, rope and 1 comp. air loco. Track gauge 36 in.
S of M—Hand and comp. air mach.
PP—10 return tubular boilers, total 2,250 H. P., 3 air comp., 3 pumps.
EMP—802. Last fiscal year output 423,318 tons.

Nottingham No. 15 Mine, Shaft and Slope.
PO—Plymouth, Pa. SP—Same. CTY—Luzerne. RR—C. R. R. of N.J.
MF—J. Becker, (Outside), Plymouth, Pa. T. A. Jones, (Inside), Plymouth, Pa. Chas. Bauer, (Inside), Plymouth, Pa.
S of H—Mules, rope, 5 comp. air and 3 Steam locos. Track gauge 34 to 56½ in.
S of M—Hand and comp. air mach.
PP—14 return tubular boilers, total 3,300 H. P., 5 air comp., 3 pumps.
EMP—1,147. Last fiscal year output 608,479 tons.

Wanamie No. 18 Mine. Slope and Drift.
PO—Wanamie, Pa. SP—Same. CTY—Luzerne. RR—C. R. R. of N.J.
MF—T. G. Faulls, (Outside), Wanamie, Pa. John Kelly, (Inside), Wanamie, Pa.
S of H—Mules, rope and 3 steam locos. Track gauge 36 in.
S of M—Hand and mach.
PP—10 return tubular boilers, total 1,666 H. P., 3 pumps.
EMP—893. Last fiscal year output 500,307 tons.

Maxwell No. 20 Mine, Shaft and Slope.
PO—Ashley, Pa. SP—Same. CTY—Luzerne. RR—C. R. R. of N.J.
MF—D. C. Tiffany, (Outside), Ashley, Pa. Sam'l Griffith. (Inside), Ashley, Pa.
S of H—Mules, rope, 3 comp. air and 1 steam loco. Track gauge 42in.
S of M—Hand and comp. air mach.
PP—14 return tubular boilers, total 2,720 H. P., 3 air comp., 6 pumps.
EMP—968. Last fiscal year output 473,244 tons.

Buttonwood No. 22 Mine, Shaft. Operate washery.
PO—Wilkes-Barre, Pa. SP—Same. CTY—Luzerne. RR—C. R. R. of N. J.
MF—J. W. Price, (Outside), Wilkes-Barre, Pa. W. J. Powell, (Inside), Wilkes-Barre, Pa.
S of H—Mules and rope. Track gauge 36 in.
S of M—Hand and comp. air mach.
PP—10 return tubular boilers, total 1,500 H. P., 2 air comp., 5 pumps.
EMP—615. Last fiscal year output 195,770 tons.

Audenried No. 4 Mine, Slope and Stripping.
PO—Audenried, Pa. SP—Same. CTY—Schuylkill. RR—C. R. R. of N.J.
MF—C. T. Lazarus, (Outside), Audenried, Pa. Jas Phillips, (Inside), Audenried, Pa. Neal Gallagher, (Inside), Audenried, Pa.
S of H—Mules, rope, 1 elec. and 3 steam locos. Track gauge 42 in.
S of M—Hand and mach.
PP—29 return tubular boilers, total 3,085 H. P., 2 air comp., 10 pumps.
EMP—986. Last fiscal year output 406,933 tons.

Honey Brook No. 5 Mine, Slope and Stripping.
PO—Audenried, Pa. SP—Same. CTY—Schuylkill. RR—C. R. R. of N.J.
MF—J. S. Davis, (Outside), Audenried, Pa. Dan'l Sube, (Inside), Audenried, Pa.
S of H—Mules, rope and 5 steam locos. Track gauge 42 in.
S of M—Hand and mach.
PP—23 return tubular boilers, total 2,745 H. P., 1 air comp., 3 pumps.
EMP—695. Last fiscal year output 299,292 tons.

WASHERIES.

Empire Washery.
PO—Wilkes-Barre, Pa. SP—Same. CTY—Luzerne. RR—C. R. R. of N. J.
ME—C. L. Peck....Wilkes-Barre, Pa.
S of H—1 Steam loco.; track guage 35 in.
PP—Steam from Stanton Colliery.
EMP—40. Last fiscal year output 114,120 tons.

Buttonwood Washery.
PO—Wilkes-Barre, Pa. SP—Same CTY—Luzerne. RR—C. R. R. of N. J.
MF—T. H. Owens...Wilkes-Barre, Pa.
S of H—Scraper Line.
PP—Steam from Buttonwood Colliery.
EMP—36. Last fiscal year output 123,914 tons.

Parrish Washery, Dirt Bank.
PO—Plymouth, Pa. SP—Same. CTY—Luzerne. RR—C. R. R. of N.J.
MF—Geo. Gould ......Plymouth, Pa.
S of H—Scraper Line.
PP—Steam from Parrish Colliery.
EMP—63. Last fiscal year output 202,251 tons.

LOCUST MTN. COAL CO.
General Office, Shenandoah, Pa.
Weston Mine; Tunnel and Stripipng Mammoth, Swenft, Skidmore, Buck and Little Buck Seams.
PO—Shenandoah, Pa.; SP—Same; CTY—Schuylkill; RR— L. V. Mahanoy & Shamokin Br.
PR—J. C. Brown....Philadelphia, Pa.
TR—A. C. Dodson....Bethlehem, Pa.
GM—T. M. Dodson..Shenandoah, Pa.
MS—B. H. Stockett, " "
PA—P. J. Malloy, Morea Colliery, Pa.
EM—Wm. H. Gibson...Shenandoah, Pa.
MM—Harry Brecker, " "
EE—P. J. Paul, " "
SCO—Shenandoah Store Co.
S of H—4 elec. locos. Track gauge 36 in.
S of M—Hand.
PP—2 boilers, loco. type, 2 air comp., also purchase power.
EMP—675. Last fiscal year output 332,342 tons.
Sales agency, Weston Dodson & Co., Inc., Bethlehem, Pa.

McCAULEY COAL CO.
Pickaway Mine; Drift; Red Ash Seam, 30 to 72 in. thick.
PO—Pittston, Pa.; **SP**—Yatesville, Pa.; CTY—Luzerne; RR—L. V.
PR—W. Hibbs, ... Pittston, Pa.
TR—W. H. McCauley, " "
GM—W. H. McCauley, " "
PA—W. H. McCauley, " "
GS—G. T. Rowan, " "
EM—G. T. Rowan, " "
MM—A. L. McCauley, " "
MS—John Carden, " "
S of H—Mules; track gauge, 29 in.
S of M—Hand.
PP—Boiler, 80 H. P.
Sales Agent, W. H. McCauley, Pittston, Pa.

McTURK, W. R., COAL CO.
General Office, Philadelphia, Pa.
Girard Mine, Slope, Mammoth and Buck Mtn., Seam 25 to 35 ft. thick;
PO—Girardville, Pa.; **SP**—Same; **CTY**—Schuylkill; **RR**—Reading.
PR—W. R. McTurk, Philadelphia, Pa.
TR—Wm. Ebert, Jr. . . . . . . " "
GM—Morton H. McTurk, Girardville, Pa.
PA—M. H. McTurk, " "
S of H—3 Steam loco. and mules; **track** gauge 36 in.
S of M—Hand.
PP—5 Water tube, B. & W. **boilers**, total 2,500 H.P., 4 engines, 2 **air** compressors and 4 pumps.
EMP—350.

MARPLETON COAL CO.
PR—Theo. L. Switzer, . . Plymouth, Pa
No report.

MARKLE, G. B. CO.
General Office, Jeddo, Pa.
PR—John Markle . . . . Jeddo, Pa.
TR—W. W. Hindenmach, " "
GM—A. B. Jessup, " "
Asst GM—G. P. Troutman, " "
PA—T. C. Smith, " "
MM—J. R. Morgan, " "
EE—W. Biesel,
DS—Jacob Stidel, " "
DS—Dan Levan, " "
DS—J. Kiemberger, " "
DS—C. McGill, " "
SCO—Jeddo Supply Co. Buyer, Frank Walk, Jeddo. Pa.

Jeddo No. 7 Mine, Slope and Stripping.
PO—Harleigh, Pa. SP—Jeddo, Pa. CTY—Luzerne. RR—L. V., Ebervale Branch.
MS—Jas. Renshaw . . . . Jeddo, Pa.
SM—Harry Buckalew . . . . Harleigh, Pa.
S of H—1 steam loco. and mules. track gauge 56¼ in.
S of M—Hand
PP—2 Heine, water tube boilers, total 1,000 H. P., 1 gen. unit, 1 pump
EMP—252. Last fiscal year output 338,000 tons.

Ebervale Mine, Slope and Strippings.
PO—Ebervale, Pa. SP—Jeddo, Pa. CTY—Luzerne. RR—L. V., Ebervale Branch.
MS—Jas. Renshaw . . . . Jeddo, Pa.
SM—George Ash . . . . Ebervale, Pa.
S of H—3 elec. loco. and mules. Track gauge 56¼ in.
S of M—Hand
PP—1 B. & W. water tube boiler, 300 H. P., 4 gen. units.
EMP—Included with Jeddo No. 7.

Jeddo No. 4 Mine, Slope and Shaft. Operate washery.
PO—Jeddo, Pa. SP—Same. CTY—Luzerne. RR—L. V., Ebervale Branch.
MS—Jas. Renshaw . . . . Jeddo, Pa.
S of H—4 elec. loco. and mules. Track gauge 56¼ in.
S of M—Hand
PP—9 B. & W. water tube boilers, total 2,500 H. P., 14 engines, 2-400 K. W. rotaries, 16,000 A. C., 3 phase, 25 cycles, 275 volts D. C., 1 comp., 1 pump.
EMP—870. Last fiscal year output 614,000 tons.
Highland Nos. 2, 5 and 6 Mines, Slopes.
PO—Jeddo, Pa. SP—Same. CTY—Luzerne. RR—L. V., Highland Branch.
MS—P. Marley . . . . Jeddo, Pa.
S of H—3 elec., 5 comp. air, 2 steam loco. and mules. Track gauge gauge 56¼ in.
S of M—Hand
PP—17 water tube boilers, total 3,400 H. P., 26 engines, 1 gen. unit, 110 K. W., 525 volts D. C., 5 comp., 9 pumps. Electric power purchased.
EMP—1,074. Last fiscal year output 815,000 tons.

MARYD COAL CO.
General Office, Land Title Building, Philadelphia, Shaft and Drift, Anthracite Seam.
PO—Maryd, Pa.; SP—Tuscarora, Pa.; CTY—Schuylkill.
PR—J. S. Wentz . . . . Philadelphia, Pa.
TR—H. B. Price, " "
GM—T. E. Snyder . . . . . Hazleton, Pa.
PA—A. J. Kotch, " "
EM—B. C. Osler, " "
MS—Arthur Kennedy . . . . . . Maryd, Pa.
SM—A. W. Gundry, " "
MM—Isaac Beaver . . . . . . Wilburton, Pa.
SCO—Maryd Supply Co. Buyer, W. S. Singley, Hazelton, Pa.
S of H—Mules.
S of M—Hand
PP—7 boilers, total 1,670 H. P.
EMP—500.
Sales agent, H. C. Barr, Philadelphia, Pa.

MEADOW HILL COAL CO.
General Office, Scranton Life Insurance Bldg., Scranton, Pa.
PO—Scranton, Pa.; SP—Minooka, Pa.; CTY—Lackawanna; RR—D. & H.
PR—F. P. Benjamin . . . . Scranton, Pa.
TR—W. L. Houck " "
PA—E. H. Ritter " "
MS—F. P. Benjamin " "
SM—F. P. Benjamin " "
Operate washery only.

MIDVALLEY COAL CO.
General Office, Land Title Building, Philadelphia, Pa.
Midvalley Nos. 1 and 2, Slope and Drift.
PO—Wilburton, Pa. SP—Same and Centralia, Pa. CTY—Columbia.
PR—D. B. Wentz . . . . Philadelphia, Pa.
TR—H. B. Price, " "
GM—T. E. Snyder . . . . Hazleton, Pa.
PA—A. J. Kotch, " "
EM—B. C. Osler, " "
MS—H. D. Kostenbauder . . Wilburton, Pa.
EE—Isaac Beaver, " "
SCO—Midvalley Supply Co. Buyer, W. S. Singley, Hazleton.
SM—Guy Watson . . . . Wilburton, Pa.
S of H—Gasoline loco. and mules.
S of M—Hand
PP—16 boilers, total 3,000 H. P.
EMP—550.
Sales Mgr., H. C. Barr, Philadelphia, Pa.

MILL CREEK COAL CO.
Middle Lehigh Mine, Slope and Stripping, B. C. D., 3 splits and seams.
PO—New Boston, Pa. SP—Same and Middle Lehigh, Pa. CTY—Schuylkill. RR—L. V. and P. R. R.
PR—Warren Delano . . . . New York, N. Y.
GM—T. D. Jones . . . . New Boston, Pa.
GS—J. E. Jones. " "
PA—Leon M. Brobst, " "
EM—Geo. W. Evans, " "
SM—Samuel Klechner, " "
S of H—Mules, hand and 5 steam loco. Track gauge 42 in.
S of M—Hand and 1 comp. air mach.
PP—Boilers, total 2,300 H. P., 1 comp., 5 pumps.
EMP—250. Last fiscal **year** output 99,000 tons.
Sales **agent**, W. **Kishbaugh, Mauch** Chunk, Pa.

MINOOKA COAL CO.
Minooka Mine; Slope; Nos. 1, 2 and 3, Dunmore Seam, 144 to 168 in. thick.
PO—Scranton, Pa.; SP—Virginia; CTY—Lackawanna; RR—L. & W. V.
PR—P. J. Heaney . . . New York, N. Y.
GM—H. W. Howard . . . . . Scranton, Pa.
PA—H. W. Howard, " "
EM—H. W. Howard, " "
MS—H. W. Howard, " "
TR—H. W. Howard, " "
S of H—2 Elec. loco.; track gauge, 36 in.
S of M—Hand.
PP—1 gen. unit, 3 phase, 25 cycles. Power purchased.
EMP—75.
Sales Agent, W. H. Howard, Sranton, Pa.

MOOSIC COAL COMPANY
General Office, Wyoming, Pa.
Moosic Mine; Drift; Red Ash Seam; 28 to 72 in thick.
PO—Moosic, Pa.; SP—Same; CTY—Lackawanna; RR—Erie, Hillside Br.
PR—P. I. Heaney, 1520 W. Farmers Road, Bronx, New York City, N. Y.

MOOSIC MOUNTAIN COAL CO.
Marshwood, Pa.
Moosic Mountain Colliery, Slope and Drift, Dunmore Seam, 18 to 48 in. thick.
PO—Marshwood, Pa. SP—Throop, Pa. CTY—Lackawanna. RR—Del. Lacka. & West., O. & W. Division.
PR—M. S. Kemmerer, Mauch Chunk, Pa.
TR—Chas. P. Ford . . . . Marshwood, Pa.
GS—Chas. P. Ford, " "
MS—Milton Hoodmacher, " "
EM—Stevenson & Knight. Scranton, Pa.
SCO—C. P. Ford & Co. Buyer, A. G. Hopkins, Marshwood, Pa.
S of H—Mules and steam engines. Track gauge 3 ft.
S of M—4 elec. mach.
PP—5 return tubular boilers, 1 air comp., 1 pump, total 750 H. P.,
EMP—450. Last fiscal year output 220,000 tons.

MOUNT HOPE COAL COMPANY
General Office, Harrison Bldg., Philadelphia, Pa.
Mt. Hope Mine; Slope; Mammoth Vein 12 to 30 ft. thick.
PO—St. Clair, Pa.; SP—Same; CTY—Schuylkill; RR—P. & R.
PR—Robert B. Beahm, Sharon Hill, Pa
TR—F. P. Ryder . . . . . . Norristown, Pa
GS—I. D. Beahm . . . . . . St. Clair, Pa
MS—Thos. Hawkins " "
S of H—Mules and 4 steam loco. Track gauge 36 in.
S of M—Hand and 1 steam shovel.
PP—5 return tubular boilers, total 600 H. P.
EMP—150. Last fiscal year output 133,730 tons. Sales agency, Mt. Hope Coal Company.

MT. JESSUP COAL CO., Ltd.
Mt. Jessup Mine.
PO—Peckville, Pa. SP—Winton, Pa. CTY—Lackawanna.
TR—Chas. P. Ford . . . . . Peckville, Pa.
MS—Edward H. Ford, " "
S of H—2 steam loco.
S of M—Hand
PP—12 boilers, **total 2,940 H. P., 4** pumps.
EMP—746. **Last fiscal year output** 240,274 tons.

NAY AUG COAL CO.
Nay Aug Colliery, Slope, Dunmore, Seam 6 to 10 ft. thick.
Operate washery.
PO—Scranton, Pa.; SP—Dunmore, Pa.; CTY—Lackawanna; RR—Erie.
PR—David Boies, ... Scranton, Pa.
TR—Chas. B. Staats . . . . . Albany, N. Y.
GM—E. H. Leaning . . . . . Scranton, Pa.
PA—J. D. McNulty, " "
EM—E. H. Leaning, " "
GS—John A. Hines, " "
MM—John A. Hines, " "
CE—M. S. Knight, " "
EE—Wm. Mulrooney, " "
S of H—Mules, rope; track gauge 22 in.
S of M—Hand.
PP—3 Return tubular boilers, total 250 H.P., 4 gen. unit, 250 volts A.C., 3 phase 60 cycles, also purchase power.
EMP—230. Last fiscal year output 95,278 tons.
Sales Agency, New York & New England Coal Co., Albany, N. Y.

NORTH AMERICAN COAL CO.
Out of business.

NORTHERN ANTHRACITE COAL CO.
General Office, Dunmore, Pa.
Murray Mine; Shaft; Seam 60 to 78 in. thick.
PO—Murray, Pa.; SP—Lopez, Pa.; CTY—Sullivan; RR—L. V.
PR—M. J. Murray . . . . Dunmore, Pa.
EM—G. P. Allen, " "
GM—J. F. Flannelly . . . . Lopez, Pa.
GS—J. F. Flannelly, " "
PA—J. F. Flannelly, " "
TR—P. P. Murray . . . . Murray, Pa.
MS—R. G. May, " "
S of H—3 Gasoline loco. and mules; track gauge 36 in.
S of M—Hand.
PP—4 Return tubular boilers, total 450 H. P., 3 pumps.
EMP—305. Last fiscal year output 165,000 tons.
Sales Agent, J. F. Flannelly, Lopez, Pa.

NO. 6 COAL CO.
Slope, "Dunmore No. 1" Seam, 6 ft. thick.
PO—Dunmore, Pa. SP—Same. CTY—Lackawanna. RR—Erie.
PR—Wm. Y. Moffat . . . . . . Dunmore, Pa.
TR—John G. Moffat . . . . . Dunmore, Pa.
GM—W. Y. Moffatt, " "
PA—W. Y. Moffatt, "
MS—W. Y. Moffatt, "
S of H—Mules.
S of M—Hand
PP—Purchase power, 220 volts A. C., 3 phase, 60 cycles.
EMP—29. Last fiscal year output 7,474 tons.

OAK HILL COAL CO.
Oak Hill Colliery, Shaft, Slope and Drift; Skidmore, Buck Mtn., White Ash and Black Heath Seams, 60 to 1008 in. thick.
PO—Duncott, Pa. SP—Same and Minersville, Pa. CTY—Schuylkill. RR—P. & R., Minersville Branch
PR—T. M. Righter, Mt. Carmel, Pa.
GM—T. M. Righter . . . . Duncott, Pa.
PA—J. D. Martin . . . . . . Duncott, Pa.
MS—J. T. Cartwright . . . . Duncott, Pa.
MM—Wm. Roth, " "
CE—A. B Cochran & Son. Pottsville, Pa.
SCO—Duncott Store, Duncott, Pa. Buyer J. D. Martin.
S of H—Mules, and 5 steam locos. Track gauge 36 in.
S of M—Hand
PP—5 Maxine water tube boilers, total 2,500 H. P., 3 pumps.
EMP—610. Last fiscal year output 296,840 tons.

O'BOYLE-FOY ANTHRACITE COAL CO.
General Office, Pittston, Pa.
O'Boyle-Foy Mine, Shaft, "B," "C" and "D," Seams 3 to 6 ft. thick.
PO—Murray, Pa.; SP—Bernice, Pa.; CTY—Sullivan; RR—L. V.
PR—M. W. O'Boyle . . . . . . Pittston, Pa.
GM—M. W. O'Boyle, " "
TR—John H. Foy, " "
MS—M. J. Clemons . . . . Murray, Pa.
S of H—Mules and rope. . . . .
S of M—Hand.
PP—3 Wicks and Heine Water Tube Boilers, total 700 H.P., 1 pump.
EMP—225. Last fiscal year output 88,428 tons.

PARDEE, A., & CO.
Cranberry Mine, Shaft; Operate Washery.
PO—Hazleton, Pa.; SP—Same; CTY—Luzerne; RR—Lehigh Valley.
GS—Frank Pardee . . . . . . Hazleton, Pa.
PA—A. P. Platt, " "
MS—J. E. Anderson, " "
EM—J. E. Anderson, " "
SCO—Buyer, B. W. Wilde, " "
S of H—Mules, rope and 11 inside and 6 outside steam loco.; track gauge 42 in.
S of M—Hand.
PP—Boilers, total 6,000 H.P., 1 air compressor and 12 pumps.
EMP—1,400. Last fiscal year output 570,000 tons.

PARDEE BROTHERS & CO., Inc.
Lattimer Mine, Shaft, Slope and Stripping, Mammoth, Primrose, Alpha, Gamma, Buck Mtn., Wharton and Holmes Seams; Operate Washery.
PO—Lattimer Mines, Pa.; SP—Hazleton, Pa.; CTY—Luzerne; RR—L. V. R. R.
PR—C. Pardee, Jr., Lattimer Mines, Pa.
TR—Ario Pardee, 1447 Drexel Bldg., Philadelphia, Pa.
GM—C. Pardee, Jr. . Lattimer Mines, Pa.
PA—Jno. W. Crooks, " " "
MS—Robt. Fagan, " " "
SM—Wm. Gabrio, " " "
S of H—3 elec., and 10 steam locos. Standard track gauge.
S of M—Hand.
PP—12 Water tube boilers, total 4,000 H.P., 2 air compressors and 2 pumps, also purchase power.
EMP—993. Last fiscal year output 644,137.05 tons.
Sales Agent, T. B. Fryer, 447 Drexel Bldg., Philadelphia, Pa.
(Old information.)

PENNSYLVANIA COAL CO.
General Office, 50 Church St., New York, N. Y.
PR—W. A. May . . . . Scranton, Pa.
TR—F. H. Wright, " "
PA—Wm. R. Collins . . . . New York, N. Y.
CE—Alexander Bryder . . . . . . Scranton, Pa.
EM—C. W. Neuffer . . . . . . Dunmore, Pa.
EE—M. E. Walthall . . . . . . Scranton, Pa.
DS—David Given . . . . Plainsville, Pa.
GS—W. P. Jennings . . . . . . Scranton, Pa.
GS—J. P. Jennings, " "
Sales Agent, Williams & Peters, No. 1 Broadway, New York, N. Y.

No. 14 Colliery, Slope, drift and shaft, Hillman, Diamond, Checker, Pittston, Marcy, Clark and Red Seams.
PO—Plainsville, Pa. SP—Pittston, Pa. CTY—Luzerne. RR—Erie.
S of H—5 comp. air and 3 steam locos. gravity and mules.
S of M—Hand.
PP—20 boilers, total 3,600 H. P., 4 comp., 5 pumps.
EMP—1,604. Last fiscal year output 699,430 tons.

Ewen Colliery, Shaft, Checker, Pittston, Marcy, Clark and Red Ash Seams.
PO—Pittston, Pa. SP—Same. CTY—Luzerne. RR—Erie.
S of H—2 steam locos. and mules.
S of M—Hand.
PP—20 boilers, total 3,500 H. P. 3 comp., 6 pumps.
EMP—1,380. Last fiscal year output 506,156 tons.

No. 6 Colliery, Shaft, Checker, Pittston, Marcy, Clark and Red Ash Seams.
PO—Inkerman, Pa. SP—Pittston, Pa. CTY—Luzerne. RR—Erie.
S of H—6 comp. air, 2 steam locos. and mules.
S of M—Hand.
PP—19 boilers, total 3,494 H. P., 9 comp., 1 pump.
EMP—1,524. Last fiscal year output 565,957 tons.

No. 9 and Barnum Collieries, Shafts, Checker, Pittston, Marcy, Clark and Red Ash Seams.
PO—Pittston, Pa. SP—Same. CTY Luzerne. RR—Erie.
MS—H. T. McMillan . . . . Pittston, Pa

S of H—20 elec., 8 steam locos., gravity and mules
S of M—Hand.
PP—38 boilers, total 5,362 H. P., 1 comp., 9 pumps.
EMP—1,944. Last fiscal year output 870305 tons.

Central and Old Forge Mines, Drifts and Shafts, Marcy, Clark and Red Ash Seams.
PO—(C) Avoca, Pa. (OF) Old Forge, Pa. SP—Same. CTY—Luzerne and Lackawanna. RR—Erie.
MS—J. W. Reid ....Avoca, Pa.
S of H—46 elec., 6 steam locos, gravity and mules.
S of M—Hand.
PP—48 return tubular boilers, total 5,600 H. P., 14 pumps.
EMP—2,217. Last fiscal year output 1,094,451 tons.

Nos. 1 and 5 Mines, Drifts, Shafts and Slopes, Clark, Marcy and Red Ash Seams.
PO—Dunmore, Pa. SP—Same. CTY—Lackawanna. RR—Erie.
MS—Jesse Palmer ......Dunmore, Pa.
S of H—11 elec., 5 steam locos., gravity and mules.
S of M—Hand.
EMP—1,861. Last fiscal year output 937,102 tons.

PEOPLES COAL CO.
Oxford Mine, Shaft, Clark and Dunmore Seams, 4-10 ft. thick.
PO—Scranton, Pa. SP—Same. CTY—Lackawanna. RR—D. L. & W., Oxford Switch.
PR—F. P. Christian....Scranton, Pa.
TR—F. P. Christian, " "
PA—R. L. Kissinger, " "
MS—Wm. McLaughlin, " "
EM—J. H. Pearn, " "
MM—Wm. McLaughlin, " "
EE—W. B. Dommick, " "
SCO—Oxford Store Co. Buyer, F. W. Pickering, Scranton, Pa.
S of H—2 Elec. loco., 1 storage battery, rope and mules.
S of M—3 Elec. mach. and hand.
PP—5 water tube, boilers, 1,500 H. P., 2 gen. units, voltage D. C., 1 comp. and 3 pumps.
EMP—400. Last fiscal year output 160,000 tons.

PHILADELPHIA & READING COAL AND IRON CO.
PO—Pottsville, Pa.
PR—W. J. Richards....Pottsville, Pa.
MM—W. H. Lesser, " "
EE—J. T. Jennings,...Pottsville, Pa.
GS—G. B. Hadesty......Pottsville, Pa.
CE—Geo. S. Clemens....Pottsville, Pa.
EM S&M—Charles Enzian, Pottsville, Pa.
Supt S&M—John Wood, " "
EM—John R. Hoffman, " "
DS—Geo. Clemons, " "
EM—John Bevan, " "
DE—E. J. Weimer,
DE—W. A. Seitzinger...Ashland, Pa.
DE—Fred Caldwell......Shamokin, Pa.
DE—Leslie Lamont......Pottsville, Pa.
DE—Frank Bender.....Shenandoah, Pa.
DE—T. Van Buren...Mahanoy City, Pa.
DE—J. O. Rhodes......Minersville, Pa.
DE—Joseph Maguire......Fremont, Pa.
DS—Jos Garner.......Shenandoah, Pa.
DS—P. J. Brennan......Shamokin, Pa.
DS—Michael Doyle.......Fremont, Pa.
PA—Scott & Landis..Philadelphia, Pa.

Anchor Washery, John Veith, Otto, Glendower, Phoenix Park and Pine Knot Collieries.
DS—E. J. Weimer......Minersville, Pa.
MS (Inside)—Chas. Gallagher, Minersville, Pa.
MS (Outside—J. W. Morrison, Minersville, Pa.
S of H—9 steam locos. and mules.
S of M—Hand.
PP—36 boilers, total 6,690 H. P., 12 pumps, 3 air comp.
EMP—1,955. Last fiscal year output 840,613 tons.

Eagle Hill, Silver Creek and Wadesville Mines.
DS—Claude Lewis.......Pottsville, Pa.
GS—E. E. Kaercher, " "
MS (Inside)—David Jones, Pottsville, Pa.
MS (Outside)—Wm. Tiley, " "
S of H—9 steam, 3 air and 1 elec. locos. and mules.
S of M—Hand.
PP—58 Tubular boilers, total 6,000 H. P., 8 pumps and 5 air comp.
EMP—2,449. Last fiscal year output 938,963 tons.

Tunnel Ridge, Ellengowen, Knickerbocker, Mahanoy City, North Mahanoy, St. Nicholas, Boston Run Mines.
DS—John H. Pollard.Mahanoy City, Pa.
MS— (Inside)—J. P. McDonald, St. Nichols, Pa.
MS (Outside)—F. B. Dawson, Mahanoy City, Pa.
S of H—13 steam, 10 air and 8 elec. locos. and mules.
S of M—Hand.
PP—120 tubular boilers, total 15,000 H. P., 22 pumps, 9 air comp.
EMP—4,670. Last fiscal year output 1,801,638 tons.

West Shenandoah, Turkey Run, Shenanroah City, Indian Ridge, Plank Ridge Washery, Draeper, Gilberton and Kohinoor Mines.
DS—Morgan Bevan.......Ashland, Pa.
MS (Outside)—A. D. Gable, Shenandoah, Pa.
S of H—10 steam, 3 air and 5 elec. locos. and mules.
S of M—Hand.
PP—86 tubular boilers, total 10,750 H. P., 14 pumps, 11 air comp.
EMP—4,379. Last fiscal year output 1,358,137 tons.

Lincoln, Brookside, Good Spring, Middle Creek Washery.
DS—E. W. Kaercher....Pottsville, Pa.
MS (Inside—Jos. H. Lee, " "
MS—(Outside)—R. J. Schneider Pottsville, Pa.
S of H—7 steam, 9 elec. locos. and mules.
S of M—Hand and 4 comp. air mach.
PP—66 return tubular boilers, total 8,250 H. P., 8 pumps.
EMP—2,974. Last fiscal year output 1,200,070 tons.

Hammond, Bast and Potts Mines.
MS—James Wilson........Ashland, Pa.
S of H—10 steam and 5 air locos. and mules.
S of M—Hand.
PP—52 tubular boilers, total 6,500 H. P., 8 pumps, 5 air compressors.
EMP—2,313. Last fiscal year output 1,011,618 tons.

PINE HILL COAL CO.
Pine Hill Mine; Shaft, Drift and Slope; Buck Mtn., Middle Split, Skidmore Ridge, 35 to 49 in. thick.
PO—Minersville, Pa. SP—Lytle, Pa. CTY—Schuylkill; RR—P. R. R., Minersville Br.
PR—Edw. B. Sturges, No. 17 Battery Place, New York, N. Y.
GM—C. B Sturges, No. 17 Battery Place, New York, N Y.
TR—F. E. Platt, Scranton, Pa.
GS—C. H. Strange.....Minersville, Pa.
PA—S. E. Lott, Minersville, Pa.
EM—F. S. Gallus.....Minersville, Pa.
CE—Allen Kellar......Minersville, Pa.
MM—Fred Gilmartin....Minersville, Pa.
MS—Wm. Crook, " "
EE—W. G. Taylor, Minersville, Pa.
SCO—Pine Hill Coal Co. Supply store. Buyer, S. E. Lott, Minersville, Pa.
S of H—7 Elec. loco. and mules, rope and gravity. Track gauge 36 in.
S of H—Hand, elec. and 6 comp. air machines.
PP—4 Maxim boilers, 3,000 H. P., 2 gen. units, 250 volts, D. C. 1 compressor and 5 pumps.
EMP—720. Last fiscal year output 307,670 tons. Sales agent, C. B. Sturges, New York, N. Y.

PITTSTON COAL MINING CO.
General Office, Pittston, Pa.
Hadleigh Mine. Shaft and slopes, Seam 66 to 180 in. thick.
PO—Sugar Notch, Pa. SP—Same. CTY Luzerne. RR—L. V., C. R. R. of N. J. Hadleigh, Br.
PR—John J. Brown.....Scranton, Pa.
TR—M. W. O'Boyle .....Pittston, Pa.
GM—M. W. O'Boyle.....Pittston, Pa.
PA—Jas. F. O'Boyle " "
GS—C. M. O'Boyle.....Kingston, Pa.
MS—Frank Ward......Sugar Notch, Pa.
EE—Frank Hoffner....Sugar Notch, Pa.
CE—C. M. O'Boyle......Kingston, Pa.
S of H—Mules, rope and 2 elec. loco.; track gauge 36 in.
S of M—Hand.
PP—2 boilers, total 800 H. P., gen. units, 275 volts D. C.
EMP—325. Last fiscal year output 175,000 tons.
Sales agent, Jas. F. O'Boyle, Pittston, Pa.

PLYMOUTH COMPANY INC.
General Office, 17 Battery Place, New York City.

Washery.
PO—Plymouth, Pa. SP—Same; CTY—Luzerne; RR—D. L. & W.
PR—George F. Clitter, New York, N. Y.
TR—James H. Cullen Jr. " "
SM—James H. Cullen Jr. " "
GS—Tom John, Plymouth, Pa.
PA—A. R. Cullen, New York, N. Y.
PP—Purchase power.
EMP—30.

PLYMOUTH RED ASH COAL CO.
General Office, Scranton, Pa.
Red Ash Mine, Slope, Red Ash Seam, 22 to 24 ft. thick.
PO—Plymouth, Pa.; SP—Same; CTY—Luzerne; RR—D., L. & W., Bloomsburg Div.
PR—D. L. Fickes, ...Scranton, Pa.
TR—S. H. Swingle, " "
PA—S. H. Swingle, " "
GM—W. L. Schlager, " "
S of H—2 Elec. loco. and mules.
S of M—Hand.
PP—Power purchased.
EMP—49. Last fiscal year output 16,028 tons.

PORT CARBON COAL CO.
Lucie R. Mine; Slope & Drift; Barclaugn, Barnes and Tunnel Seams, 30 to 160 in. thick.
PO—Port Carbon, Pa. SP—Same. CTY—Schuylkill. RR—P. & R., Schuylkill Valley Br.
PR—Thos. F. Slattery...Phila., Pa.
TR—D. I. Slattery ....Tuscarora, Pa.
GM—D. I. Slattery, " "
EM—A. B. Cochran & Sons, Pottsville, Pa.
PA—Samuel Moore....Port Carbon, Pa.
MS—Samuel Moore...Port Carbon, Pa.
SCO—Slattery Bros. Buyer, D. I. Slattery, Tuscarora, Pa.
S of H—Mules and 4 elec. loco. Track gauge 38 in.
S of M—Hand.
PP—1 air comp., 2 pumps. Power purchased.
EMP—100. Last fiscal year output 53,411 tons.

Tamaqua Washery.
PO—Tamaqua; SP—Same; CTY—Schuylkill; RR—P. & R., Little Schuylkill branch.
MS—Daniel Slattery.....Tuscarora, Pa.
S of H—Mules and 1 steam loco. Track gauge 38 ins.
PP—2 return tubular boilers, total 150 H. P., 2 pumps.
EMP—10.

PRICE, PANCOAST COAL CO.
General Office, Scranton, Pa.
Pancoast Mine, Shaft, Seams 2½ to 4 ft. thick.
PO—Throop, Pa.; SP—Same; CTY—Lackawanna; RR—O. & W. and D. L. & W.
PR—J. B. Dickson, 17 Battery Pl., New York, N. Y.
TR—Jessey L. Eddy, 14 Battery Pl.NY.
GM—John R. Bryden....Scranton, Pa.
GS—Jos. V. Birtley .....Throop, Pa.
PA—Harry J. Birtley, ...Scranton. Pa.
MS—Wm. Reid ....Throop, Pa.
CE-EM—Frank G. Wolf, Scranton, Pa.
S of H—Rope; track gauge 36 in.
S of M—Hand.
PP—11 Tubular boilers, total 1837 H.P., 2 compressors, 3 pumps.
EMP—1400. Last fiscal year output 404,759 tons.
Sales Agent, Jos. B. Dickson, 17 Battery Pl., New York, N. Y.

RAUB COAL CO.
Louise Mine, Shaft, Slope and Drift, Ross and Red Ash Seam.
PO—Luzerne, Pa. SP—Same. CTY—Luzerne; RR—L. V., D. L. & W.
PR—W. T. Payne ......Kingston, Pa.
PA—J. B. Blackman....Kingston, Pa.
TR—H. B. Schooley..Wilkes-Barre, Pa.
EM—Chas. S. Miles, " "
GM—Gwillym Edwards....Luzerne, Pa.
MS—Gwillym Edwards, " "
EE—Ziba Bonham.....Dorranceton, Pa.
S of H—2 Steam loco., mules and rope; track gauge 36 in.
S of M—Hand and 1 elec. mach.
PP—3 water tube and 4 return tubular boilers, total 1,200 H. P., 440 volts, A. C., 3 phase, 60 cycle.
EMP—500. Last fiscal year output 167,539.11 tons.

RED ASH COAL CO.
Slope and stipping Mine.
PO—Wilkes-Barre, Pa.; CTY—Luzerne; RR—C. R. R. of N. J.
PR—G. Frederick.....Wilkes-Barre, Pa.
TR—Walter Roberts..Wilkes-Barre, Pa.
GS—T. F. Minford, Wilkes-Barre, Pa.
S of H—5 Steam loco.
PP—3 Return Tubular Boilers, 4 Pumps.

REESE, T. R. & SON
Dusky Diamond Mine, Slopes.
PO—Audenreid, Pa.; SP—Same; CTY—Luzerne; RR—C. R. R. of N. J. & L. V.
PR—T. R. Reese.......Audenreid, Pa.
GM—T. R. Reese, " "
MS—T. R. Reese, " "
MS—T. R. Reese, " "
PA—E. C. Reese..........Eckley, Pa.
SM—E. C. Reese, " "
S of H—Elec. and steam.
S of M—Hand.
PP—1 Return tubular boiler, total 90 H.P., elec. power pruchased.
EMP—9. Last fiscal year output 3,117 tons.

RISSINGER BROTHERS & CO., INC.
Out of business.

SACANDAGA COAL CO.
General Office, Scranton, Pa.
PR—David Boies ....Scranton, Pa.
TR—Chas. B. Staats,....Albany, N. Y.
GM—E. H. Leaning ... Scranton, Pa.
PA—J. D. McNulty, " "
EM—E. H. Leaning, " "
GS—J. R. Bryden, Jr., " "
MM—James Delaney, " "
CE—M. S. Knight, " "
EE—Wm. Mulrooney, " "

Mowhawk Colliery, Rock Slopes and Tunnels, County, Clark and Dunmore Veins, 24 to 108 in. thick.
PO—Carbondale; SP—Same; CTY—Lackawanna; RR—D. & H., Honesdale br.
Sales Agents, New York & New England Coal Co., Albany, N. Y.
MS—Frank Conaboy, ..Carbondale, Pa.
S of H—Mules, rope, 2 elec. and 2 steam locos. Track gauge 36 in.
S of M—2 elec. and 2 comp. air mach
PP—2 return tubular boilers, total 200 H. P., 3 phase, 60 cycles, A. C. 2 air comp., 2 pumps. Buy power.
EMP—100. Last fiscal year output 51,498 tons.

ST CLAIR COAL CO. (THE)
General Office, Scranton, Pa.
St. Clair Mine, Shaft, Slope, Drift and Stripping, Mammoth, Skidmore and Buck Mountain Seams, 4 to 60 ft. thick.
PO—St. Clair, Pa. SP—Same. CTY—Schuylkill. RR—P. & R.
PR—Wm. H. Taylor ...Scranton, Pa.
GM—Wm. H. Taylor, " "
TR—N. G. Taylor, " "
PA—T. M. Voyle........Scranton, Pa.
GS—Wm. T. Smythe..St. Clair, Pa.
EE—L. D. Bauter, " "
EM—H. W. Althouse...Pottsville, Pa.
SCO—The Schuylkill Supply Co. Buyer, H. B. Siewell, St. Clair, Pa.
S of H—6 elec., 9 steam locos., mules and rope. Track gauge 36 in.
S of M—Hand.
PP—2 water tube, 18 return tubular boilers, total 3,000 H. P., 4 pumps.
Sales agent, W. H. Taylor, Scranton, Pa.

SCRANTON COAL CO.
General Office, Scranton, Pa.
PR—John B. Kerr, ..New York, N.Y.
TR—R. D. Rickard, " " "
GM—Wm. L. Allen, ...Scranton, Pa.
PA—F. E. Platt, " "
EM—Frank G. Wolfe, " "
ME—F. L. Moore, " "
Sales Agency, Dickson & Eddy, New York, N.Y.

Pine Brook, Capouse and Mt. Pleasant Mines; Shaft.
PO—Scranton, Pa.; SP—Same; CTY—Lackawanna; RR—N.Y. O. & W., D. L. & W.
MS—Daniel Young, ...Scranton, Pa.
S of H—8 Elec. and 1 steam loco; track gauge 36 in.
S of M—Hand.
PP—1 Water tube, 18 tubular boilers, 12 cylindrical, total 3,560 H.P., 44 gen. units, 290 volts D.C., 4 compressors, 12 pumps.
EMP—1,955. Last fiscal year output 738,081 tons.

West Ridge Mine; Slope.
PO—Scranton, Pa.; SP—Providence Station, Pa.; CTY—Lackawanna; RR—N. Y. O. & W.
MS—Daniel Young, ...Scranton, Pa.
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—6 Return tubular boilers, total 490 H.P.; 10 gen. units.
EMP—253. Last fiscal year output 58,132 tons.

Richmond No. 3 Mine; Shaft.
PO—Scranton, Pa.; SP—Throop, Pa.; CTY—Lackawanna; RR—N. Y. O. & W.
MS—Daniel Young, ...Scranton, Pa.
S of H—Mules; 1 steam loco.; track gauge 36 in.
S of M—Hand.
PP—4 Water tube, 2 return tubular boilers, total 1,000 H.P., 10 gen. units, 2 pumps.
EMP—238. Last fiscal year output 112,780 tons.

Johnson Mine; Shaft and slope.
PO—Dickson City, Pa.; SP—Same; CTY—Lackawanna; RR—N. Y. O. & W.
MS—J. K. Berkheiser, Olyphant, Pa.
S of H—3 Elec., 3 steam loco. and mules; track gauge 36 in.
S of M—1 Elec. mach. and hand .
PP—17 Tubular boilers, total 2,100 H.P., 31 gen. units 550 volts D.C., 1 compressor, 8 pumps.
EMP—862. Last fiscal year output 283,481 tons.

(Continued on Next Page.)

Scranton Coal Co.—Cont.
Raymond Mine; Shaft, slope and drifts.
PO—Archbald, Pa.; SP—Winton, Pa.; CTY—Lackawanna; RR—N. Y. O. & W.
MS—James W. Smith, Peckville, Pa.
S of H—2 Elec., 3 steam loco and mules; track gauge 36 in.
S of M—Hand.
PP—11 Return tubular boilers, total 1,185 H.P., 19 gen. units 275 volts D. C., 1 compressor, 9 pumps.
EMP—692. Last fiscal year output 268,532 tons.

Ontario Mine; Shaft, tunnel and drift; Operate Washery.
PO—Peckville, Pa.; SP—Winton, Pa.; CTY—Lackawanna; RR—N. Y. O. & W.
MS—James W. Smith, Peckville, Pa.
S of H—2 Elec., 4 steam loco. and mules; track gauge 36 in.
S of M—Hand.
PP—25 Cylinder, 12 tubular boilers, total 1,600 H.P., 43 gen. units 275 volts D.C., 1 compressor, 7 pumps.
EMP—1,025. Last fiscal year output 394,278 tons.

Riverside Mine; Shaft.
PO—Winton, Pa.; SP—Same; CTY—Lackawanna; RR—N. Y. O. & W.
MS—James W. Smith, Peckville, Pa.
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—7' Return tubular boilers, total 1,015 H.P., 12 gen. units, 1 compressor, 2 pumps.
EMP—215. Last fiscal year output 77,538 tons.

SCRANTON ANTHRACITE COAL CO.
General Office, Burr Building, Scranton, Pa.
Oak Hill Colliery; Drift; Clark and No. 3 Dunmore Seam; 42 to 66 in. thick.
PO—Scranton, Pa.; SP—Moosic, Pa. on the N. Y. O. & W. R. R. and Minooka, Pa. on the D. & H.; RR—N. Y. O. & W., Moosic Br.
PR—Richard R. Walsh, . . . Scranton, Pa.
TR—John T. O'Toole, " "
GM—M. J. Rafferty, " "
GS—John T. O'Toole, " "
PA—M. J. Rafferty, " "
MS—W. J. Madden, " "
CE—H. A. Dawson, " "
EM—Chas. Guldan, " "
MM—J. J. McGuire, " "
S of H—Mule, rope, gravity.
S of M—Hand.
PP—2 loco. boilers, 1 air comp.
EMP—156. Output 50,000 tons.

SHAMOKIN RED ASH COAL CO.
Operate Washery.
PO—Shamokin, Pa.; SP—Mt Carmel, Pa.; CTY—Northumberland; RR—P. R. R.
PR—D. H. McGhee . . . . . . Shamokin, Pa.
TR—Joseph J. Evans, . . Shamokin, Pa.
GM—D. H. McGhee, " "
GS—D. H. McGhee, " "
PA—D. H. McGhee, " "
PP—Boiler 150 H.P.
Sales Agency, John Hersker, Mahanoy City, Pa.

SHIPMAN KOAL CO.
Colbert Mine; Shaft and Drift; Mammoth, Gamma and Buck Mtn. Seams, 36 to 96 in.
PO—Shamokin, Pa.; SP—Same; CTY—Northumberland; RR—P. R. R, Lancaster Br.
PR—Hon. John B. Corliss, Shamokin, Pa.
TR—J. M. Stauffer, " "
GM—J. M. Stauffer, " "
GS—J. M. Stauffer, " "
PA—R. E. Fetter, " "
MM—Wm. Stonecker, " "
S of H—2 Gasoline loco.; track gauge, 44 in.
S of M—Hand.
PP—3 B. & W. Stirling water tube boilers, total 1200 H. P., 2 compressors, 2 pumps.
EMP—432.
Sales Agency, Pattison & Bowns, No. 1 Broadway, New York, N. Y.

SMITH, H. H., & CO.
Hudson Washery.
PO—Shaft, Pa.; SP—Shenandoah, Pa.; CTY—Schuylkill; RR—P. & R.
PR—H. H. Lineaweaver, Philadelphia, Pa.
GM—Godfrey Laudeman . . . Pottsville, Pa.
PP—4 Return tubular boilers.
EMP—41. Last fiscal year output 87,000 tons.

SOUTH SIDE COAL CO.
Suuth Side Washery.
PO—Scranton, Pa.; SP—Same; CTY—Lackawanna; RR—D. & H.
GM—F. P. Benjamin . . Scranton, Pa.
PA—F. P. Benjamin, " "
PP—2 Boilers, total 160 H. P.

SPENCER COAL CO.
Spencer Mine, 2 Shafts, Clark & Dunmore Seam.
PO—Dunmore, Pa.; SP—Same; CTY—Lackawanna; RR—Erie.
PR—C. W. Robbins . . . . . . Dunmore, Pa.
GM—F. M. Spencer, " "
TR—F. M. Spencer, " "
MS—A. J. McHale, " "
PA—F. H. Wills, " "
S of H—Mules, rope and 5 elec. loco; track gauge Standard.
S of M—Hand.
PP—4 Boilers, total 575 H.P.
EMP—250. Last fiscal year output 70,000 tons.

SPRUKS COAL CO.
Drift Mine; No. 2 Dunmore Seam.
PO—Scranton, Pa.; SP—Same; CTY—Lackawanna; RR—Erie.
PR—S. S. Spruks . . . . Scranton, Pa.
TR—David Spruks " "
GM—David Spruks, " "
PA—G. A. Dickerson " "
MS—Johathan Vipond " "
S of H—2 elec. and gasoline loco. Track gauge 30 in.
S of M—Hand.
PP—Power purchased.
EMP—30. Output 20,000 tons.
Successors to the East Mountain Coal Co.

STACKHOUSE, E. S., COAL CO.
Salem Colliery, Drift, Baltimore, Ross and Middle Dunmore Seams, 2 to 10 ft. thick. Operate Washery.
PO—Shickshinny, Pa.; SP—Same; CTY—Luzerne; RR—D., L. & W. D. & H., P. R. R.
PR—E. S. Stackhouse, Shickshinny, Pa.
TR—E. S. Stackhouse, " "
GM—E. S. Stackhouse, " "
GS—E. S. Stackhouse, " "
PA—Wm. C. Cortright, Box 259 " "
MF—P. F. Mitchell, " "
EE—Peri DeMartin, " "
EM—Chas. S. Miles, Wilkes-Barre, Pa.
SCO—Hill Store, Buyer, Frank Jayne, Shickshinny, Pa.
S of H—4 Elec. loco.; track gauge 3 ft.
S of M—Hand.
PP—1 Erie Return Tubular Boiler, 150 H. P., 1 gen. unit, 250 volts D. C., 1 air compressor and 3 pumps; also purchase power.
EMP—218. Last fiscal year output 75,113 tons.

SUSQUEHANNA COAL CO.
General Office, Wilkes-Barre, Pa.
PR—Morris Williams . . Philadelphia, Pa.
TR—Arthur Haviland . . Philadelphia, Pa.
GM—Robt. A. Quin . . Wilkes-Barre, Pa.
PA—Address the Co., " "
Mech Eng—F. J. McMahon, " "
EE—Harry Reese, " "
Sales agency, Address Philadelphia Office

Short Mtn. and Williamstown Collieries (Lykens Div.) Shaft, Slope and Drift, Lykens, Buck Mtn., Holmes and Primrose Seams, 2 to 10 ft. thick. Operate washeries.
PO—Lykens, Pa. SP—Same and Williamstown, Pa. CTY—Dauphin RR—P. R. R., Northern Central Branch.
MS—David J. Randall . . . . . Lykens, Pa.
S of H—10 elec., 5 steam locos. and mules. Track gauge 40 and 47 3-4 in.
PP—91 B. & W. water tube, 9 loco. type boilers, total 11,620 H. P., 5 gen. units, 275 and 300 volts D. C., 7 air comp., 26 pumps.
EMP—2469. Last fiscal year output 634,608.08 tons.

William Penn Colliery, Shaft, Drift and Stripping.
PO—Shaft, Pa. SP—Shenandoah, Pa. CTY—Schuylkill. RR—P. R. R.
MS—W. W. Williams . . . . Shaft, Pa.
S of H—1 steam loco. and mules. Track gauge 48 in.
S of M—Hand.
PP—6 B.&W. water tube, 10 Vulcan return tubular boilers, total 2,300 H. P., 1 comp., 1 emergency pump.
EMP—594. Last fiscal year output 324,483.11 tons.

Collieries Nos. 5, 6 and 7 Mines (Wyoming Div.), Shafts, Slopes and Drifts, George, Mills, Hillman, Cooper, Forge, Twin, Ross, Lee Seams. Operate washery.
PO—(5-7) Nanticoke, Pa. (6) Glen Lyon, Pa. SP—Same. CTY—Luzerne. RR—P. R. R., Sunbury Div.
MS—F. H. Kohlbraker . Nanticoke, Pa.
S of H—11 Elec., 10 comp. air, 17 steam loco. and mules. Track gauge 36 and 42 in.
S of M—1 elec. machine and hand.
PP—54 water tube, 18 Cylinder boilers, total 14,662 H. P., 2 gen. units 275 and 300 volts D C., 4 gen. unit 2,300 volts A. C., 3 phase, 60 cycles, 11 comp. and 8 pumps.
EMP—3959. Last fiscal year output 1,361,939.03 tons.

Lytle Colliery Mine, Shaft, Buck Mtn., Skidmore, Mammoth, 3 Splits, Four Foot, Holmes, Primrose, Diamond and Tracy Seams, 3 to 13 ft. thick.
PO—Minersville, Pa. SP—Lytle, Pa. CTY—Schuylkill. RR—P. R. R., Minersville Branch.
MS—E. A. Van Horn . . . Minersville, Pa.
S of H—4 Elec. 1 Steam loco and mules. Track gauge 44 in.
S of M—Hand.
PP—2 B. & W. water tube, 23 Vulcan return tubular boilers, total 3,950 H. P., 1 gen. unit 2,300 volts A. C., 3 phase, 60 cycles, 2 gen. units 575 volts D. C., 3 compressors, 1 pump.
EMP—864. Last fiscal year output 362,379.18 tons.

Luke Fidler Colliery, Slopes, Drifts and Shaft, Nos. 2, 4, 8, 9, 10, 11 and 12 Seams, 3 to 8 ft. thick.
PO—Shamokin, Pa. SP—Same. CTY—Northumberland. RR—P. R. R.
MS—Wm. A. Auman . . . . . Shamokin, Pa.
S of H—3 steam loco. and mules. Track gauge 40 in.
S of M—Hand.
PP—10 B. & W. water tube, 6 Vulcan, return tubular boilers, total 2,120 H. P., 2 gen. units, 2,300 volts A. C., 2 comp., 2 pumps.
EMP—609. Last fiscal year output 162,203.15 tons.

Cameron Colliery, Slopes, Drifts and Shaft, Nos. 2, 4, 5, 6, 7, 7½, 8, 9, 9½, 9 3-4, 10, 10½, 11, 12, 13 and 14 Seams, 2 to 12 ft. thick.
PO—Shamokin, Pa.; SP—Same; CTY—Northumberlind; RR—P. R. R.
MS—Wm. Auman . . . . Shamokin, Pa.
S of H—3 Elec., 2 steam loco. and mules; track gauge 39 in.
S of M—Hand.
PP—16 B. & W. water tube boilers, total 1,980 H. P., 1 gen. unit, 275-300 volts D. C., 1 comp., 3 pumps.
EMP—1087. Last fiscal year output 351,975.14 tons.

Scott Colliery; Shafts; Nos. 4, 6, 8, 9, 9½ Seams, 3 to 8½ ft. thick.
PO—Shamokin, Pa.; SP—Kulpmont, Pa.; CTY—Northumberland; RR—P. R. R.
MS—Wm. A. Auman . . . . . Shamokin, Pa.
S of H—2 Elec. loco. and mules; track gauge 44 in.
S of M—Hand.
PP—16 B & W water tube boilers, total 2000 H. P., 2 gen. units 2300 volts A. C., 1 compressor.
EMP—827. Last fiscal year output 241,610.03 tons.

Richards Colliery; Slopes and drifts; Nos. 4, 5, 6, 8, 9, 9½, 9 3-4, 10, 10½ and 11 Seams, 3 to 8 ft. thick.
PO—Mount Carmel, Pa.; SP—Same; CTY—Northumberland; RR—P.R.R.
MS—Wm. A. Auman . . . . . Shamokin, Pa.
S of H—4 Elec ., 4 steam loco. and mules; track gauge 48 in.
S of M—Hand.
PP—18 Vulcan, return tubular boilers, total 2700 H. P., 1 gen. unit 275-300 volts D. C., 1 compressor, 1 pump.
EMP—973. Last fiscal year output 303,541.19 tons.

Hickory Ridge Colliery; Slopes; Nos. 4, 8, 9, 9½ ft. Seams; 3 to 8 ft. thick.
PO—Shamokin, Pa.; SP—Same; CTY—Northumberland; RR—P. R. R.
MS—Wm. A. Auman . . . . . Shamokin, Pa.
S of H—2 Elec., 6 steam loco. and mules; track gauge 44 in.
S of M—Hand.
PP—6 B. & W. water tube, 16 Vulcan, return tubular boilers, total 3650 H. P., 1 comp., 8 pumps.
EMP—852. Last fiscal year output 251,344.14 tons.

Pennsylvania Colliery; Slopes; Nos. 4, 5, 8, 9, 9½, 9 3-4. 10 10½, 11 Seams, 2 to 7 ft. thick.
PO—Mount Carmel, Pa.; SP—Same; CTY—Northumberland; RR—P.R.R.
MS—Wm. A. Auman . . . . . Shamokin, Pa.
S of H—5 Elec., 2 steam loco. and mules.
S of M—Hand.
PP—16 Vulcan return tubular boilers, total 2400 H. P., 1 gen. unit 275, 300 volts D. C., 6 pumps.

EMP—1055. Last fiscal year output 351,380.12 tons.

Hickory Swamp washery. Abandoned.

TEMPLE COAL CO.
General Office, Scranton, Pa.
PR—S. B. Thorne . . . . . . Scranton, Pa.
VP—F. H. Hemelright, " "
Secy-Treas—A. M. Bingham, " "
PA—A. C. Twitchell, " "
EM—Geo. H. Engel, " "
MM—Alexander Kethel, " "
EE—Alexander Kethel, " "
Asst MM—John Mellow . . . . Jermyn, Pa.
Sales Agents, Thorne, Neale & Co., Philadelphia, Pa., and Dickson & Eddy, New York, N. Y.

NORTHWEST COLLIERY CO.
Northwest Colliery, Slope.
PO—Simpson, Pa., SP—Carbondale, Pa. CTY—Lackawanna. RR—N. Y., O. &W.
MS—Tudor Aston . . . . Simpson, Pa.
S of H—Mules, 1 elec. and 2 steam locos. Track gauge 36 in.
S of M—Hand
PP—3 B. & W. water tube boilers, total 750 H. P., 1 gen. unit, 250 volts D. C., 2 air comp., 1 pump.
EMP—284. Last fiscal year output 87,235.14 tons.

LACKAWANNA COAL CO., LTD.
Lackawanna Colliery, Shaft.
PO—Olyphant, Pa.; SP—Same; CTY—Lackawanna. RR—O. & W.
MS—Joseph Reese, ... Olyphant, Pa.
S of H—Mules. 2 steam and 8 elec. locos. Track gauge 36 in.
S of M—Hand.
PP—3 B. & W., 4 Maxine water tube boilers, total 2,100 H. P., 250 volts D. C.. 2 pumps.
EMP—732. Last fiscal year output 321,549.02 tons.

STERRICK CREEK COLLIERY CO.
Sterrick Creek Colliery, 2 Shafts and 1 Drift.
PO—Peckville, Pa. SP—Same. CTY—Lackawanna. RR—D. L. & W., Erie and D. & H.
MS—Joseph Reese . . . . Blakely, Pa.
S of H—Mules, 2 elec. and 3 steam locos. Track gauge 36 in.
S of M—Hand and 2 electric machines.
PP—4 Maxim and 4 Sterling water tube. boilers, total 1,850 H. P., 2 gen. units, 2,300 volts A. C., 2 phase, 60 cycles. 2 air comp., 3 pumps.
EMP—899. Last fiscal year output 443,281.06 tons.

FORTY-FORT COAL CO.
Forty-Fort Colliery.
PO—Maltby, Pa. SP—Luzerne, Pa. CTY—Luzerne. RR—D. L. & W., L. V.
MS—James J. McCarthy, Luzerne, Pa.
S of H—Mules and tail rope. Track gauge 42 in.
S of M—Hand.
PP—7 Sterling water tube boilers, total 1,800 H. P., 1 gen. unit, 440 A. C., 3 phase, 60 cycles, 2 pumps.
EMP—758. Last fiscal year output 278,484.06 tons.

Harry E. Colliery.
PO—Luzerne, Pa. SP—Same. CTY—Same. RR—D. L. & W., L. V.
MS—James J. McCarthy, Luzerne, Pa.
S of H—1 elec. 1 steam loco. and rope. Track gauge 42 in.
S of M—1 elec. mach. and hand.
PP—7 Sterling water tube boilers, total 1,600 H. P., 1 gen. unit D. C., 2 pumps. Purchase power for haulage and pumping.
EMP—756. Last fiscal year output 261,167.03 tons.

MT. LOOKOUT COAL CO.
Mt. Lookout Colliery, Shaft.
PO—Wyoming, Pa. SP—Same. CTY—Luzerne. RR—D. L. & W., Lehigh Valley.
MS—Seward Button . . . . . Wyoming, Pa.
S of H—Mules, 1 steam and 9 elec. locos. Track gauge 36 in.
S of M—Hand and 2 elec. mach.
PP—10 Sterling water tube boilers, total 2,300 H. P., 3 gen. units, 250 volts D. C., 3 air comp., 3 pumps
EMP—826. Last fiscal year output 313,935.09 long tons.

THOMAS COLLIERY CO.
General Office, Philadelphia, Pa.
Kehley's Run Colliery; Slopes and strippings; Mammoth, Buck Mtn., Seven Foot and Skidmore Seams, 3 to 40 ft. thick.
PO—Shenandoah, Pa.; SP—Same; CTY—Schulykill; RR—Reading.
PR—Percy C. Madeira . Philadelphia, Pa.
TR—Louis C. Madeira, " "
GM—W. G. Thomas . . . . . Pottsville, Pa.
GS—W. G. Thomas " "
PA—W. G. Thomas " "
EM—Charles J. Graff . . . . Pottsville, Pa.
MM—Elmer Eisenhower, Shenandoah, Pa.
MS—John Price . . . . Shenandoah, Pa.
S of H—4 Steam loco. and mules; track gauge 44 in.
S of M—2 Comp. air mach. and hand.

PP—7 Vulcan, 2 Erie, 4 Kendall, return tubular boilers, total 195 H. P., 1 comp. and 4 pumps.
EMP—595. Last fiscal year output 258,206 tons. Sales Agency, Madeira, Hill & Co., Philadelphia, Pa.

TRADERS COAL CO.

General Office, Scranton, Pa.
Ridgewood Mine; Shaft, Slope and drift; Red Ash, Ross, and Baltimore Seams, 24 to 72 in. thick.
PO—Laflin, Pa.; SP—Hudson, Pa.; CTY—Luzerne; RR—C. R. R. of N. J., Erie, D. & H., Everhart Br.
PR—Ed. B. Jermyn......Scranton, Pa.
GM—Ed. B. Jermyn, " "
TR—Chas. Schlager, " "
PA—Chas. Schlager, " "
GS—John Corcoran....Old Forge, Pa.
CE—Frank Smith........Hudson, Pa.
MM—Frank Smith, " "
EM—Leon Whaite........Renham, Pa.
MS—John Conway and Edw. Jenkins, Laflin, Pa.
S of H—6 Elec. loco.
S of M—Hand.
PP—3 Pumps.
EMP—410. Last fiscal year output 146,275 tons.
Sales Agent Chas. Schlager, Scranton, Pa.

TREVORTON COLLIERY COMPANY.

General Office, 1004 Citizen Bldg., Cleveland, Ohio.
Katherine Mine, Drift and Slope.
PO—Shamokin, Pa., Box 324; SP—Dunkleberger, Pa.; CTY—Northumberland. RR—P. & R., Herndon Branch.
PR—J. P. Burton......Cleveland, O.
TR—C. Burton, " "
PA—C. Burton, " "
GS—C. T. Starr........Shamokin, Pa.
MS—Robert Kramer, " " "
S of H—Mules, rope and 1 gasoline loco. Track gauge 44 in.
S of M—Hand and comp. air mach.
PP—3 Sterling Maxim return tubular boilers total 900 H. P., 1 air comp.; 2 pumps.
EMP—300. Last fiscal year output 120,000 tons.

UPPER LEHIGH COAL CO.

General Office, Philadelphia, Pa.
Upper Lehigh Mine, Slope and Stripping, Buck Mtn. Seam, 3-7 ft. thick.
PO—Upper Lehigh, Pa.; SP—Same. CTY—Luzerne. RR—C. R. R. of N. J., Upper Lehigh Branch.
PR—J. S. Wentz.....Philadelphia, Pa.
TR—H. B. Price, " "
GM—T. E. Snyder.......Hazleton, Pa.
PA—A. J. Kotch, " "
MS—C. H. Rohland..Upper Lehigh, Pa.
EM—B. C. Osler..........Maryd, Pa.
EE—John E. Culp...Upper Lehigh, Pa.
SCO—Upper Lehigh Supply Co., Ltd., Buyer, W. S. Singley, Hazleton, Pa.
SM—Jacob Powell, Upper Lehigh, Pa.
S of H—7 Steam loco. and mules; track gauge 4 ft. 3½ in.
S of M—Hand and steam shovel.
PP—5 Water tube boilers, total H.P. 1,750, 3 return tubular boilers, 450 H.P., 2 gen. units, 115 volts, 1 compressor, 2 pumps.
EMP—234. Last fiscal year output 171,529 gross tons.
Sales Agent, H. C. Barr, Phila., Pa.

VAN WICKLE, A. S. (EST)

General Office, Hazleton, Pa.
Coleraine Colliery, Slope, 3 ft. 8 in. to 25 ft. thick.
PO—Leviston, Pa.; SP—Same. CTY—Carbon; RR—L. V., C.R.R. of N.J., P. & R.
GM—Frank Pardee.......Hazleton, Pa.
GS—John Harvey, " "
PA—A. P. Platt, " "
EM—J. E. Anderson, " "
MM—Wm. J. Thomas....Leviston, Pa.
SCO—Coleraine Supply Co., Buyer W. T. Britt, Beaver Meadow, Pa.
S of H—6 Steam loco. and mules; track gauge 42 in.
S of M—Hand.
PP—2 Water tube, 16 return tubular, Vulcan and Climax, boilers, total 2150 H. P.
EMP—627. Last fiscal year output 264,354.03 long tons.
Sales Agent, Henry C. Pearson, Phila, Pa.

WACHNA-TAYLOR ANTHRACITE COAL CO.

Wachna-Taylor Mine, Slope. B and C Seam; 3½ ft. thick.
PO—Mildred, Pa.; SP—Bernice, Pa.; CTY—Sullivan; RR— Lehigh Val.
PR—E. J. Taylor, 608 Pine St., Scranton, Pa.
GM—E. J. Taylor, 608 Pine St., Scranton, Pa.
MS—E. J. Taylor, 608 Pine St., Scranton, Pa.
PA—E. J. Taylor, 608 Pine St., Scranton, Pa.
CE—E. J. Taylor, 608 Pine St., Scranton, Pa.
EM—E. J. Taylor, 608 Pine St., Scranton, Pa.
TR—T. H. Wachna.......Bernice, Pa.
MM—Ed. Hohues........Mildred, Pa.
S of H—Mules and rope, track gauge 3 ft.
S of M—Hand.
PP—2 Keller return tubular boilers total 160 H. P.; 1 pump.
Sales agent, W. J. Schrad, Mildred, Pa.

WENTZ, J. S. & CO.

Hazelbrook Mine, Slopes, Buck Mtn. Seam
PO—Hazlebrook, Pa SP—Same. CTY—Luzerne; RR—L. V.
TR—H. B. Price....Philadelphia, Pa.
GM—T. E. Snyder......Hazleton, Pa.
PA—A. J. Kotch, " "
MS—Chas. H. Rohland, Upper Lehigh, Pa.
SM—S. V. Widzbor, Hazle Brook, Pa.
EM—B. C. Osler.........Hazleton, Pa.
MM—Geo. Nemschick..Hazlebrook, Pa.
S of H—1 Gasoline loco. and mules.
S of M—5 Comp. air mach and hand.
PP—12 Return tubular boilers, 1 compressor, 5 pumps.
EMP—250.
Sales Mgr. H. C. Barr, Phila., Pa.

WEST END COAL CO.

General Office, Scranton, Pa.
West End and Melville Mines; Shaft, drift and slope.
PO—Mocanaqua, Pa.; SP—Same CTY—Luzerne; RR—P. R. R. & C. R. R. of N. J.
PR—H. H. Brady......Scranton, Pa.
TR—H. H. Brady, " "
PA—F. C. Fuller......Scranton, Pa.
MS—H. A. Filmore....Mocanaqua, Pa.
EM—C. S. Robbins,...Shickshinny, Pa.
MM—Harry Johnson, " "
EE—Jacob L. Remaly, " "
SCO—Shickshinny Store Co., Buyer, John Reidy, Shickshinny, Pa.
S of H—Mules, Rope, Gravity, Comp. air, 18 Elec. and 6 Steam locos. track gauge 36 in.
S of M—Hand.
PP—10 B. & W. and Maxine return tubular boilers, total 3300 H. P., 5 gen. units 250 volts, D. C., 4 compressors and 8 pumps.
EMP—1250. Last fiscal year output 578,000 tons.
Sales Agent, Meeker & Co., 143 Liberty St., New York, N. Y.

WEST MOUNTAIN COAL CO.

Rush Brook Mine, Drifts, Dunmore 1-2 and Clark Seam, 3 ft. thick.
PO—Jermyn, Pa; SP—Same; CTY—Lackawanna; RR—N.Y.O & W. and D. & H.
PR—John A. Komara.
GM—John A. Komara.
PA—John A. Komara
MS—Thomas Kennedy.
CE—Guy Rinker.
EE—Guy Rinker.

EM—T. Campbell.
SCO—Buyer, J. A. Komara.
S of H—Rope and mules; track gauge 28 in.
S of M—Hand and 1 elec. mach.
PP—2 Return tubular boilers, total 300 H.P., 3 gen. units, 125 volts and 1 pump.
EMP—75. Last fiscal year output 32,000 tons.
Sales Agent, John A. Komara.

WEST NANTICOKE COAL CO.

General Office, Wilkes-Barre, Pa.
West Nanticoke Mine, Slope, Tunnel and Drift, Red Ash and Ross Seam.
PO—West Nanticoke, Pa.; SP—Same; CTY—Luzerne RR—P. R. R. Sunbury Div.
PR—A. D. W. Smith, Commercial Trust Bldg., Philadelphia, Pa.
GM—A. D. W. Smith, Commercial Trust Bldg., Philadelphia, Pa.
Secy—Carl B. Metzgar, Commercial Trust Bldg., Philadelphia, Pa.
MS—E. W. Davis....Dorranceton, Pa.
S of H—1 Steam loco., and mules; track gauge 42 in.
S of M—Hand.
PP—gen. units 220 volts, A. C., 3 phase, 60 cycles; power purchased.
EMP—156. Last fiscal year output 93,718 tons.
Sales agent, Susquehanna Coal Co.

WHITE & CO.

Howard Colliery; Slope; Primrose Seam, 5 to 10 ft. thick.
PO—Pottsville, Pa.; SP—Same; CTY—Schuylkill; RR—P. R. R.
GM—Robert White.......Pottsville, Pa.
PA—Robert White, " "
MS—Robert White, " "
S of H—Mules and 1 steam loco. Track gauge 36 in.
S of M—Hand.
PP—5 return tubular boilers, total 675 H. P., 4 pumps.
EMP—236. Last fiscal year output 100,185 tons.

WHITE, JAMES MINING CO.

White Coal Co.; Slope; Checker; 84 in. thick.
PO—Pittston, Pa.; SP—Pittston Junction; CTY—Luzerne RR—L. V., D. L. & W. Junction; Pittston town track.
PR—R. A. White
TR—W. T. Ainsworth,..New York City
GM—Jas. White......Wilkes-Barre, Pa.
GS—Jas. White " "
PA—W. T. Ainsworth,..New York City
EE—Harry White
EM L. V. Crew..........Pittston, Pa.
SM—James White, " "
S of H—Mules and Rope. 1 elec. loco. Track gauge 36 in.
S of M—Hand.
PP—Power purchased.
EMP—22. Daily output 75 tons.
Sales Agency, Lehigh Valley Coal Co.
Note—Expect to double output shortly.

WILKES-BARRE ANTHRACITE COAL CO.

Hillman Mine, Shaft, Hillman and Staton Seams. Operate washery.
PO—Wilkes-Barre, Pa.; SP—Same; CTY Luzerne; RR—L. V.
GM—Thos. H. Price..Wilkes-Barre, Pa.
PA—J. O. Thompson, " "
EM—H. H. Kudlich " "
S of H—Mules, rope and gravity.
S of M—Hand.
PP—4 Boilers, total 1200 H. P., gen. unit 250 volts D. C., 1 comp. and 3 pumps.
(Old information.)

WILKES-BARRE COLLIERY CO.

General Office, Philadelphia, Pa.
Madeira Mine; Slopes and Drifts.
PO—Wilkes-Barre, Pa.; SP—Hudson, Pa.; CTY—Luzerne; RR—D. & H., P. R. R., Erie.
PR—Percy C. Madeira......Phila., Pa.
TR—Louis C. Madeira, " "
GM—W. G. Thomas .....Pottsville, Pa.
EM—F. B. Davenport..Wilkes-Barre, Pa.
EE—Jos. Linden..........Plains, Pa.
MF—Wm. Powell...Miner's Mills, Pa.
S of H—2 Elec. loco. and mules; track gauge 36 in.
S of M—2 Elec. mach. and hand.
PP—440 volts A. C., 3 phase and 25 cycles; Purchase power.
Last fiscal year output 147,340 tons.
Sales Agency, Madeira-Hill & Co., Philadelphia, Pa.

WOLFE COLLIERIES CO., INC., (THE)

General Office, Hudson, Pa.
Wolfe Colliery; Slope; Buck Mtn Seam, 48 to 144 in. thick.
PO—Freeland, Pa.; SP—Lattimer, Pa.; CTY—Luzerne; RR—L. V.
PR—A. F. Wolfe, ...Hudson, Pa.
TR—A. F. Wolfe, " "
GS—Joseph G. Saricks, Freeland, Pa.
GM—Jos. G. Saricks, " "
MS—John G. Saricks, " "
PA—C. E. Banker, " "
SCO—Wolfe Supply Co., " "
S of H—1 Steam loco. and mules.
S of M—Hand.
PP—3 Return tubular boilers.
EMP—200.
Sales Agency, Lehigh Valley Coal Co.

WOLF CREEK COAL CO.

Wolf Creek Mine, Slope, White Ash Seam. Operate Washery.
PO—Minersville, Pa.; SP—Same, CTY—Schuylkill; RR—Reading.
PR—Edward B. Sturges, 17 Battery Place, N. Y.
GM—C. B. Sturges, 17 Battery Place, N. Y.
TR—F. E. Platt.........Scranton, Pa.
GS—C. H. Strange.....Minersville, Pa.
PA—S. E. Lott, " "
MS—Elic McAlarney, " "
S of H—Steam.
S of M—Hand.
PP—3 Pumps.
EMP—25. Last fiscal year output 8,801 tons.

YOST MINING CO.

Out of business.

KEYSTONE
THE.
MINING
CATALOG
COMBINED WITH
COAL FIELD
DIRECTORY
CONSOLIDATED PUBLISHING
COMPANY INC.

MINING CATALOGUES

PENNSYLVANIA BITUMINOUS

For List of Abbreviations See Page 622.

ACME GAS COAL CO.

General Office, Greensburg, Pa.
Acme Mine—Drift, L. Kittanning Seam, 40 to 62 in. thick.
PO—Rimersburg, Pa.; SP—Same; CTY—Clarion; RR—P. R. R., Sligo Br.
PR—Julian B. Huff.....Greensburg, Pa.
TR—J. R. Eisaman, " "
PA—A. N. Pershing, " "
EM—Robert Morris, " "
GS—L. B. Lewis.......Rimersburg, Pa.
SCO—Rimersburg Supply Co., Rimersburg, Pa.
S of H—5 Elec. lcoo.
S of M—11 Elec. mach.
PP—4 Return tubular boilers, total 600 H. P., gen. units 2400 volts A. C., 250 volts D. C., 3 pumps.
EMP—360. Last fiscal year output 310,507.95 tons.

ADA COAL & COKE COMPANY

Ada Mine; Drift; Pittsburgh Seam; 60 to 78 in. thick.
PO—Cheat Haven, Pa.; SP—Same; CTY—Fayette; RR—B. & O.
TR—J. D. Springer.....Uniontown, Pa.
GM—J. V. Rhodes, " "
S of H—Gravity. Track gauge 42 in.
S of M—Hand.
PP—2 pumps.
Note—Successors to Ada Coke Co.

ADAMSBURG GAS COAL CO.

Mine exhausted.

AJAX-HOCKING COAL COMPANY

General Office, Baltimore, Md.
Two mines in West Virginia, 5 mines in Pennsylvania.
PR—Richard M. Duvall, Baltimore, Md.
TR—Edwin W. Adams, " "
GM—James G. Pugh, " "
PA—James G. Pugh, " "
GS—D. J. Riordan......Houtzdale, Pa.
MS—Wm. O. Houck,....Meyersdale, Pa.

Hocking No. 2 Mine; Slope; C Prime Seam; 54 in. thick.
PO—Meyersdale, Pa.; SP—Berlin, Pa.; CTY—Somerset; RR—B. & O.
S of H—Motor and rope.
S of M—2 Sullivan elec. mach.

Fort Hill Mine; Drift; "D" Vein; 42 in. thick.
PO—Fort Hill, Pa.; SP—Same; CTY—Somerset.
S of H—Mules.
S of M—Hand.

Red Jacket No. 2 Mine; Drift; Miller Vein; 48 in. thick.
PO—Phillipsburg, Pa.; SP—Same; CTY—Clearfield; RR—Penna., Tyrone & Clearfield Br.
S of H—Mules.
S of M—Hand.

Davis Mine; Drift; Moshannon Seam; 48 in. thick.
PO—Osceola Mills, Pa.; SP—Same; CTY—Clearfield; RR—Penna., T. & C. Br.
S of H—Mules.
S of M—Hand.

Fernwood Mine; Drift; Moshannon Vein; 42 in. thick.
PO—Fernwood, Pa.; SP—Same; CTY—Clearfield; RR—P. & S.
S of H—Mules.
S of M—Hand.
Note—Consolidation of Ajax Cons. Coal Co. and Hocking Coal Co.

ALADDIN COAL & COKE CO.

General Office, Leechburg, Pa.
Aladdin Mine, Drift, Upper Freeport Seam, 40 to 46 in. thick.
PO—Luscesco, Pa.; SP—Aladdin; CTY—Armstrong
PR—P. C. Madeira....Philadelphia, Pa.
TR—L. C. Madeira, " "
GM—L. W. Hicks......Leechburg, Pa.
S of H—Mules; track gauge 37 in.
S of M—Hand.
EMP—123. Last fiscal year output 70,818 tons

ALLEGHENY COAL CO.

General Office, Cleveland, O.
Harwick Mine, Shaft, Freeeport Seam, 6½ to 8 ft. thick.
PO—Harwick, Pa.; SP—Cheswick, Pa.; CTY—Allegheny; RR—P.R.R., B. & L.E.
PR—W. D. B. Alexander, Cleveland, O.
TR—C. A. Nicola, " "
GS—P. Townsend, " "
PA—C. L. Terry, " "
MS—Geo. S. Greene.....Cheswick, Pa.
CE—John M. Rayburn, Pittsburgh, Pa.
SCO—McCracken Supply Co., " "
S of H—3 Elec. loco.; track gauge 42 in.
S of M—Elec. machines.
PP—8 Erie Return Tubular Boilers, total 1,200 H.P., 2 gen. units, 250 volts, 1 air comp., 1 pump.
Sales Agent, C. L. Terry, Cleveland, O.

ALLEGHENY COAL & COKE CO.

General Office, Brackenridge, Pa.
PR—L. W. Hicks,.......Leechburg, Pa.
GM—L. W. Hicks, " "
GS—L. W. Hicks, " "
PA—L. W. Hicks, " "
CE—E. A. Waters, " "
EM—E. A. Waters, " "

Avenue Mine; Drift; Upper Freeport Seam; 32 to 44 in. thick.
PO—Brackenridge, Pa.; SP—Same; CTY—Allegheny; RR—West Penn.
S of H—3 elec. locos. Track gauge 39 in.
S of M—5 elec. mach.
PP—4 pumps. Purchase power.
EMP—80. Last fiscal year output 102,386 tons.

ALLEGHENY RIVER MINING CO.

General Office, Kittanning, Pa.
PR—Dwight C. Morgan, Kittanning, Pa.
TR—H. S. Hastings....St. Mary's, Pa.
SECY—F. A. Schmidt, Kittanning, Pa.
GS—Arnold Hirst......Kittanning, Pa.
PA—J. T. Armstrong, " "
EM—Fred Norman, " "
EE—Fred Norman....Kittanning, Pa.
SCO—Shawmut Commercial Co., Buyer, E. J. McLaughlin, St. Mary's Pa.
Supt. of Shops, David Whamond, Furnace Run, Pa.

Conifer Mine, Drift, Brookville Seam, 40 to 60 in. thick.
PO—Conifer, Pa.; SP—Same; CTY—Jefferson; RR—P. S. & N., Conifer Branch.
MS—John Woodall........Conifer, Pa.
SM—Oscar Swanson, " "
S of H—10 Elec. loco.; track gauge 36 in.
S of M—4 elec. and 52 comp. air mach.
PP—10 Return tubular, Union Iron Works boilers, total 1,500 H.P., 2 gen. units, 2400 volts A. C. and 250 volts D. C., 4 compressors and 2 pumps.
EMP—487. Last fiscal year Output 381,688 tons.

Seminole Mine, Drift, Up. Freeport Seam, 36 to 60 in. thick.
PO—Seminole, Pa., SP—Same; CTY—Armstrong; RR—P. S. & N. Oakland Br.
MS—Arthur White ......Seminole, Pa.
SM—Geo. J. Matthews, " "
S of H—7 Elec. loco.; track gauge 42 in.
S of M—24 Elec. mach.
PP—4 Return tubular, Phoenix boilers, total 600 H.P., 2 gen. units, 250 volts D.C., 2 pumps.
EMP—521. Last fiscal year output 508,653 tons.

Chickassaw Mine, Drift, L. Kittanning Seam, 36 to 60 in. thick.
PO—Chickasaw, Pa.; SP—Same; CTY—Armstrong; RR—P., S. & N., Tidal Branch.
MS—Hugh Ferguson....Chickasaw, Pa.
SM—F. W. Nangle, " "
S of H— 14 elec. loco.; track gauge 42 in.
S of M—13 elec. mach.
PP—4 Return tubular, Phoenix boilers, total 600 H.P., 2 gen. units, 250 volts D. C., and 2 pumps.
EMP—235. Last fiscal year output 210,839 tons.

Furnace Run Mine, Drift, L. Kittanning and Up. Freeport, 36 to 60 in. thick.
PO—Furnace Run, Pa.; SP—Same; CTY—Armstrong RR—P. S. & N. Main Line.
MS—Richard Morris, Furnace Run, Pa.
SM—M. A. Black, " " "
S of H—10 Elec. loco.; track gauge 42 in.
S of M—15 Elec. mach.
PP—Buy power. 2 gen. units, 2400 volts A. C., 3 phase, 60 cycles.
EMP—239. Last fiscal year output 105,739 tons.

Hunts Run Mine, Drift, Brookville Seam, 36 to 48 in. thick.
PO—Conifer, Pa.; SP—Norman, Pa.; CTY—Jefferson RR—P. S. & N., Conifer Br.
MS—John Woodall........Conifer, Pa.
S of H—1 Elec. loco., track gauge 42 in.
S of M—2 elec. mach.
PP—3 Return tubular, Economic boilers, total 300 H.P., 1 gen. unit, 250 volts D. C., and 1 pump.
EMP—47. Last fiscal year output 34,000 tons.

Cadogan Mine; Drift; Upper Freeport & L. Kittanning Seam; 36 to 60 in. thick.
PO—Kittanning, R. D. No. 5; SP—Cadogan; CTY—Armstrong; RR—Pittsburgh & Shawmut.
MS—Samuel Woodall, R. D. No. 5, Kittanning, Pa.
SM—Leo Garlerino, R. D. No. 5, Kittanning, Pa.
S of H—4 elec. loco.
S of M—14 elec. mach.
PP—2 return tubular boilers, total 900 H. P., 2 gen. units, 2400 volts A. C., 3 phase, 60 cycles, 1 pump.
EMP—109. Last fiscal year output 22,553 tons.

ALTOONA COAL & COKE CO.

General Office, Altoona, Pa.
Delaney No. 5 and Horse Shoe; Slope Lemon or "E" Seams, 50 ins. thick.
PO—Coupon, Pa.; SP—Kittanning Point, Pa.; CTY—Cambria; RR—P. R. R., Kittanning Run Branch.
PR—John Lloyd, Sr., ..Altoona, Pa.
TR—John Lloyd, Sr., " "
PA—W. D. Canan, " "
GM—T. L. Jones........Latrobe, Pa.
GS—John L. Munro.......Coupon, Pa.
MS—John L. Munro, " "
MM—Edward Eckenrode, " "
EE—James E. Holmberg, " "
CE—Jos. Sillyman & Co...Altoona, Pa.
SCO—Horse Shoe Supply Co. Buyer, W. D. Canan, Altoona, Pa.
S of H—2 Elec. loco. and mules. Track gauge 36 in.
S of M—5 elec., 2 comp. air mach. and hand.
PP—5 Return tubular boilers, total 660 H. P., 250 volts D. C., 1 air comp. Also power purchased.
EMP—262. Coke ovens, 70 Bee Hive. Last fiscal year output, 185,421 tons. Sales agent, Wm. Arble, Altoona, Pa.

ALVERTON COAL & COKE CO.

Alverton, Pa. No report.

AMERICAN CONNELLSVILLE COAL & COKE CO.

General Office, Pittsburgh, Pa.
PR—Eugene S. Reilly, Pittsburgh, Pa.
TR—M. B. Kelly, " "
GM—M. B. Kelly, " "
PA—J. P. Kelly, " "
GS—F. W. Byrne,......Braznell, Pa.
MS—F. W. Byrne, " "
EM—H. Burchinal ....Uniontown, Pa.
Sales Agency, American Steel Co., Pittsburgh, Pa.

American No. 1 Mine.
Drift; Pgh. Seam, 96 to 120 in. thick.
PO—Braznell, Pa.; SP—Linn, Pa.; CTY—Fayette; RR—P. V. & C.
S of H—1 Elec. loco.
S of M—2 Elec. mach.
PP—Power purchased, 1 pump.
Coke ovens 142 Bee Hive.

American No. 2 Mine.
Drift; Pgh. Seam, 96 to 120 in. thick.
PO—RFD No. 15, Masontown, Pa.; SP—Martin, Pa.; CTY—Fayette; RR—Monon.
S of H—1 Elec. loco.
S of M—1 Elec. mach.
PP—3 Return tubular boilers, 1 gen. unit 250 volts D.C. Coke ovens—240 Bee Hive..
NOTE—Can ship 20,000 tons of coal and 20,000 tons of coke monthly.
Formerly the Francis Nos. 1, 2 and Cyrilla Mines of the Sunshine Coal & Coke Co.

AMERICAN MANGANESE MFG. CO.

General Office, Philadelphia, Pa.
Furnace Nos. 1 and 2 Mines; Slope and drift; Up. Freeport Seam, 42 to 72 in. thick.
PO—Dunbar, Pa.; SP—Same; CTY—Fayette; RR—P. R. R., B. & O., P. & L. E., W. Md.
PR—E. E. Marshall, Philadelphia, Pa.
GM—(Asst.) L. S. Kirchner, Dunbar, Pa.
GS—L. S. Kirchner, " "
PA—R. Palmer, " "
MS—John Greaves, " "
MM—Adam Worthman, " "
CE—S. W. Henshaw, Uniontown, Pa.
S of H—Comp. air loco., mules aand rope.
S of M—14 Comp. air mach. and hand.
PP—2 Rust water tubes, 6 return tubular boilers, total 1,000 H.P., 3 compressors, 8 pumps.
EMP—95. Coke ovens—220 Bee Hive (not in operation).
Last fiscal year output (No. 1) 55,000 tons.
Sales Agency, Shimer & Co., Pittsburgh, Pa. and Philadelphia, Pa.
Formerly the Dunbar Furnace Plant.

AMERICAN SHEET & TIN PLATE CO.

General Office, Frick Building, Pittsburgh, Pa.
Kirkpatrick Mine; Drift; Up. Freeport Seam.
PO—Leechburg, Pa.; SP—Same; CTY—Armstrong; RR—P. R. R.
GM—A. H. Beale....Vandergrift, Pa.
PA—M. S. Dennis....Pittsburgh, Pa.
EM—G. C. Kimball, " "
MS—S. T. Shoff......Leechburg, Pa.
S of H—Mules.
S of M—Hand.
EMP—40. Last fiscal year output

Scottdale Mine.
PO—Scottdale, Pa.
CTY—Fayette.
EMP—22. Last fiscal year output State report.

AMERICAN ZINC AND CHEMICAL CO. (COAL DEPT.)

General Office, 228 Oliver Bldg., Pittsburgh, Pa.
Langeloth Mine; Shaft and Slope, Pittsburgh No. 8 Seam; 56 to 60 in. thick.
PO—Langeloth, Pa.; SP—Burgettstown, Pa.; CTY—Washington; RR—P. C. C. & St. L., Langeloth Br.
PR—Archibald Jones....Langeloth, Pa.
MS—W. Geo. Schallcross, " "
TR—Julian P. Beatty, 61 Broadway, New York City.
GM—Geo. T. Kirkbride..Pittsburgh, Pa.
PA—Geo. T. Kirkbride " "
EE—Chas. Cunningham, Langeloth, Pa.
EM—Geo. S. Baton & Co., Pittsburgh, Pa.
SCO—Langeloth Mercantile Co., Langeloth, Pa.
S of H—6 elec. loco. Track gauge 36 in.
S of M—9 elec. mach.
PP—1 pump, 3 phase, 60 cycle, 660 volts D. C. Central power plant connected with the zinc plant.
EMP—250. Last fiscal year output 96,000 tons.
Sales agents, Langeloth Coal Co., 228 Oliver Bldg., Pittsburgh, Pa.

ANITA COAL MINING CO.

General Office, Punxsutawney, Pa.
Anita Nos. 6 and 7 Mines; Slopes; Up. Freeport Seam 5½ ft. thick.
PO—Horatio, Pa.; SP—Same, CTY—Jefferson; RR—P. R. R.
PR—Thos. Fisher....Philadelphia, Pa.
TR—W. S. Blaisdell, Punxsutawney, Pa.
PA—Geo. Sheldon, " "
MM—J. A. Davis, " "
GM—W. S. Blaisdell, " "
MS—N. S. White,......Horatio, Pa.
SCO—Anita Supply Co., Mgr., J. B. Williams, West Punxsutawney, Pa.
S of H—3 elec. loco. Track gauge 40 in.
S of M—8 Comp. air mach.
PP—7 Sterling, 3 Alton and 2 Meadville boilers, 3 compressors and 3 pumps.
EMP—350. Last fiscal year output 250,000 tons.

APOLLO COAL CO.

General Office, Greensburg, Pa.
North West Mine, Drift, Freeport Seam, 4½ ft. thick.
PO—Salina, Pa.; SP—Same; CTY—Westmoreland; RR—P. R. R.
PR—H. C. Burket.....Greensburg, Pa.
PA—H. C. Burket, " "
TR—J. R. Eisaman, " "
MS—H. H. Tussey........Salina, Pa.
S of H—Mules and 2 elec. loco. Track gauge 40 in.
S of M—Hand and 3 elec. mach.
PP—1 Pump, power purchased.
EMP—84. Last fiscal year output 75,400 tons.
Sales Agent, H. C. Burket.

ARGYLE COAL CO.
General Office, Greensburg, Pa.
Argyle No. 1 and 2 Mines; Drift; Miller or "B" Seam, 32 to 54 in. thick.
PO—South Fork, Pa.; SP—Same; CTY—Cambria; RR—Penna., Main Line.
TR—A. N. Pershing.....Greensburg, Pa.
GM—A. N. Pershing, " "
PA—A. N. Pershing, " "
CE—Robt. Morris, " "
EM—Robt. Morris, " "
GS—M. J. Bracken.. ..Gallitzin, Pa.
MS—J. A. Dunsmore....South Fork, Pa.
SCO—South Fork Supply Co., South Fork, Pa.
S of H—Mules, rope and gravity.
S of M—Hand.
PP—6 Reurn tubular boilers, total 490 H. P., 1 air compressor, 5 pumps.
EMP—260. Last fiscal year output 224,189.75 net tons.

ARMERFORD COAL MINING CO.
General Office, Blairsville, Pa.
Armerford Mine; Drift; Miller Seam.
PO—Dilltown, Pa.; SP—Scott Glenn, Pa.; CTY—Indiana; RR—P. R. R., C. & C. Div.
PR—D. E. Thompson, Blairsville, Pa.
GM—D. E. Thompson, " "
GS—D. E. Thompson, " "
PA—D. E. Thompson, " "
TR—C. F. Armstrong..Leechburg, "
CE—E. E. Hewitt......Dilltown, "
MS—J. R. Shaffer, " "
SCO—Armerford Supply Co. Buyer, D. E. Thompson, Blairsville, Pa.
S of H—2 elec. hoists.
S of M—Hand.
PP—1 pump.
EMP—75. Output 400 tons daily.
Sales Agency, J. Tatnall Lea & Co., Philadelphia, Pa.

ARMSTRONG COUNTY COAL CO.
General Office, 718 Farmers Bank Bldg., Pittsburgh, Pa.
Armstrong Mine, Drift, Upper Freeport Seam, 40 to 60 in. thick.
PO—Leechburg, Pa.; SP—Same; CTY—Armstrong; RR—P. R. R., Conemaugh Div.
PR—P. C. Madeira....Philadelphia, Pa.
TR—L. C. Madeira, " "
GM—L. W. Hicks......Leechburg, Pa.
EM—E. A. Watters, " "
S of H—Mules and 2 elec. loco. Track gauge 39 in.
S of M—20 Comp. air machines.
PP—4 Water tube, Eric boilers, total 400 H.P., 2 air compressors and 5 pumps.
EMP—200. Last fiscal year output 101,781 tons.

ARROW COAL MINING CO.
Arrow Colliery; Drift; B or Miller Seam 48 in. thick.
PO—Arrow, Pa.! SP—Same; CTY—Somerset; RR—P. R. R., Southfork Branch.
PR—William Gahagen.....Windber, Pa.
GM—William Gahagen, " "
GS—Melvin Gahagen,.......Arrow, Pa.
TR—Clarence Gahagen, " "
PA—C. Gahagen, " "
CE—Harry Gahagen......Windber, Pa.
EE—P. Wirick, ...Arrow, Pa.
SCO—Elizabeth Supply Co., Buyer, Clarence Gahagen, Arrow, Pa.
S of H—3 elec. and 1 steam loco. track gauge 42 in.
S of M—3 elec. mach.
PP—1 Sterns return tubular boilers, 100 H.P., gen. unit 250 volts D.C.; power purchased.
EMP—200. Last fiscal year output 179,200 tons.

ASHMAN COAL CO.
General Office, Philadelphia, Pa.
PR—P. C. Maderia, Philadelphia, Pa.
TR—Louis C. Maderia, " "
GS—W. R. Wilburn, Philipsburg, "
PA—W. R. Wilburn, " "
CE C. O. Messinger, " "
EM—F. F. Morgan, " "
MM—Wm. Beuner, " "
EE—W. H. Webb, Munson, "
Sales agency, Maderia, Hill & Co. Philadelphia, Pa.

Ghem Mine, Drift, "B" Seam, 36 to 42 in. thick.
PO—Munson, Pa. SP—Same. CTY—Clearfield. RR—N. Y. C. & H. R.
MS Allen Jaap......Morrisdale, Pa.
S of H—2 Elec. loco. and mules. Track gauge 34 in.
S of M—Hand.
PP—3 Phoenix and Keeler return tubular boliers, total 300 H. P. 2 gen. units 250 volts D. C. 12 pumps.
EMP—85. Last fiscal year output 99,060 tons.

ATHERTON & BARNES.
Bloomington No. 14 and Troy Mines; Drift; A Seam.
PO—Philipsburg, Pa.; SP—Same ;CTY—Centre; RR—N. Y. C.
GM—John Barnes, Jr., Philipsburg, Pa.
PA—John Barnes, Jr., " "
MS—John Barnes, Jr., " "
S of H—Elec. loco.
S of M—Hand.
EMP—165.

ATLANTIC BIG VEIN COAL CO.
Keystone Mine; Drift; Pittsburgh Seam; 84 to 116 in. thick.
PO—Meyersdale, Pa.; SP—Keystone, Pa.; CTY—Somerset; RR—B. & O., Salisbury branch.
PR—F. B. Black.......Meyersdale, Pa.
TR—W. T. Hoblitzell, " "
GM—J. M. Black, " "
PA—J. M. Black, " "
GS—J. J. Hoblitzell, " "
CE—J. J. Hoblitzell, " "
EM—J. J. Hoblitzell, " "
S of H—Rope.
S of M—Hand.
PP—2 return tubular boilers, total 300 H. P., 1 air compressor.
EMP—80.
Note—Successors to Keystone Coal Co.

ATLANTIC COAL CO.
General Office,...... Meyersdale, Pa.
PR—F. B. Black. " "
GM—F. B. Black, " "
GS—J. M. Black, Boswell, "
PA—J. M. Black, " "
TR—J. M. Black, " "
EM—J. J. Hoblitzell, Meyersdale, Pa.

Atlantic No. 1 Mine, Slope; C Prime Seam, 4½ to 5½ ft. thick.
PO—Boswell, Pa. SP—Same. CTY—Somerset. RR—B. & O., Quemahoning Branch.
S of H—Rope and mules. Track gauge 42 in.
S of M—Hand.
PP—5 Return tubular boilers, total 500 H. P. 1 compressor.
EMP—125. Last fiscal year output 142,000 tons.
Atlantic No. 2 Mine, Drift, "B" and "A" Seams, 7 to 8 ft. thick.
PO—Meyersdale, Pa. SP—Atlantic No. 2 Siding, Pa. CTY—Somerset. RR—B. & O., Connellsville Div.
S of H—Mules. Track gauge 42 in.
S of M—Hand.
PP—1 Return tubular boiler. 30 H. P. Last fiscal year output 150,000 tons.

ATLANTIC COAL MINING CO.
General Office, Philipsburg, Pa.
Atlantic Mine; Drift "E" and "D" Seams; 24 to 84 in. thick.
PO—Philipsburg, Pa.; SP—Same; CTY—Clearfield; RR—P. R. R., and P. & S.
PR—Chas. D. Loraine..Philipsburg, Pa.
PA—Chas. D. Loraine, " "
TR—H. McD. Loraine, " "
S of H—Rope and mules; track gauge, 36 in.
S of M—Hand.
PP—Motor, 100 H. P. Purchase power.

ATLANTIC CRUSHED COKE CO.
General Office, Greensburg, Pa.
PR—H. C. Burket.....Greensburg, Pa.
TR—J. R. Eisaman....Greensburg, Pa.
GM—H. C. Burket, " "
PA—H. C. Burket, " "
EM—Robert Morris, " "
SCO—Atlantic Sup. Co., New Derry, Pa.
Atlantic No. 1 Mine, Slope, Pittsburgh seam, 6 ft. thick.
PO—Bradenville, Pa.; SP—Same; CTY—Westmoreland.
S of H—Rope; track gauge 40 in.
S of M—Hand.
PP—3 Return tubular boilers, total 325 H.P.
EMP—50. Annual output 58,000 tons.

Atlantic No. 2 and 3 Mines, Shaft, Pittsburgh Seam, 6 ft. thick.
PO—New Derry, Pa.; SP—Derry, Pa.; CTY—Westmoreland.
S of H—4 Elec. Loco; track gauge 40 in.
S of M—Hand.
PP—2 Water tube, 4 return tubular boilers, total 1,000 H.P., 2 gen. units, 250 volts D.C..
EMP—319. Last fiscal year output 317,500 tons; coke ovens, Bee Hive 120, rectangular 60.

ATLAS COAL CO.
Atlas Mine; Shaft; Pittsburgh Seam; 58 to 72 in. thick.
PO—Atlasburg, Pa.; SP—Burgettstown, P.; CTY Washington; RR P. C. C. & St. L., Hickton branch.
PR—John A. Bell......Atlasburg, Pa.
GM—J. H. Sanford, " "
GS—G. F. Osler, " "
PA—R. P. Haverstick, " "
MS—J. P. McCune, " "
MM—P. King, " "
SCO—Atlas Mercantile Co.
S of H—7 elec. locos. Track gauge 44 in.
S of M—12 elec. mach.
PP—4 Erie City return tubular boilers, 2 gen. units, 250 volts D. C., 2 pumps.
EMP—240.

ATLAS COKE COMPANY.
General Office, Leetonia, Ohio.
Lafayette Mine, Slope, Pittsburg Seam, 8 to 9 ft. thick.
PO—Helen, Pa. SP—Same. CTY—Fayette. RR—Penna. R. R., Keister Branch.
PR—John McKeefrey, ...Leetonia, O
TR—N. J. McKeefrey, " "
GM—W.. D. McKeefrey, " "
MS—Jas. Henderson, Uniontown, Pa.
PA—Jas. Henderson........Helen, Pa.
MM—Jas. Steele, " "
SCO—Lafayette Supply Co., buyer, Geo. Tarr, Helen, Pa.
S of H—Mules and rope. Track gauge 42 in.
S of M—Hand.
PP—6 Return Tubular Boilers, Erie, total 550 H. P. 2 generating units, 240 volts, D. C. 2 air compressors, 3 pumps.
EMP—220. Coke ovens, 220 Bee Hive.

AULD RUN COAL CO.
Now Hill Top Coal Mining Co.

AURORA COAL COMPANY.
Oakland 4 & 5 Mines; Drift; C and D Seams.
C—42 to 48 in. thick.
D—30 to 32 in. thick.
PO—Coalport, Pa; SP—Same; CTY—Clearfield; RR—Penna., C. & I. Division.
GM—Chas. E. Potter, .. Coalport, Pa.
MS—Chas. E. Potter.....Coalport, Pa.
S of H—Mules.
S of M—Hand.
EMP—30. Last fiscal year output, 12,000 tons.

AUXILIARY COAL MINING CO.
General Office, Philipsburg, Pa.
Carbon Mine, Drift, "D" Moshannon Seam, 36-40 in. thick.
PO—Clearfield, Pa.; SP—Curwensville, Pa.; CTY—Clearfield, Pa.; RR—P. R. R., Tyrone Div.
PR—H. M. Fair.........Altoona, Pa.
GM—H. M. Fair. " "
TR—Jacob Swires .....Philipsburg, Pa.
PA—Jacob Swires, " "
GS—H. H. Homer, " "
EM—P. E. Wolmesdorf, " "
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—2 Pumps.
EMP—50. Last fiscal year output 26,738 tons.
Sales Agent. H. M. Fair. Altoona, Pa. (Old information.)

AVELLA COAL CO.
General Office, Greensburg, Pa.
Penobscot Mine, Drift, Pittsburgh Seam, No. 6, 4 ft. 8 in. thick.
PO—Avella, Pa., R.F.D. No. 2; SP—Virginia, W. Va.; CTY—Washington; RR—W. P. T. Ry.
PR—R. H. Jamison.....Greensburg, Pa.
TR—W. R. Turney, " "
GM—W. R. Turney, " "
PA—W. R. Turney, " "
MS—Eli Rohr, Avella, Pa., R.F.D. No. 2.
SCO—Avella Supply Co. Buyer, E. G. Garton, R. F. D. No. 2, Avella Pa.
S of H—Mules and 1 elec. loco.; track gauge 42 in.
S of M—5 Elec. chain machines.
PP—1 Erie City and 1 Phoenix Return Tubular Boilers, total 275 H.P., 250 volts D.C., 2 pumps.
EMP—130. Last fiscal year output 130,000 tons.
Sales Agents, Moreland Coke Co., Pittsburgh, Pa.

AVONMORE COAL & COKE CO.
Avonmore Mine, Drift.
PO—Leechburg, Pa.; SP—Edri, Pa.; CTY—Armstrong; RR—West Penn.
GM—L. W. Hicks,....Leechburg, Pa.
PA—L. W. Hicks, " "
S of H—Rope.
S of M—Hand.
PP—2 Return tubular boilers, total 240 H. P., 1 gen. unit, 3 pumps.
EMP—151. Last fiscal year output 163,477 tons.

B VEIN MINING COMPANY
Turkey Run Mine; Drift; Lower Kittanning Seam; 36 to 48 in. thick.
PO—Sligo, Pa SP—Same; CTY—Clarion. RR—Penna. Sligo. Branch
PR—R. B. Stewart, ... Sligo, Pa.
MS—R. B. Stewart, " "
EM—R. B. Stewart, " "
S of H—Mules; Track gauge 36 in.
S of M—Hand.
EMP—20.

BAGDAD COAL & COKE CO.
Bagdad Mine, Drift.
PO—Leechburg, Pa.; SP—Same, CTY—Armstrong; RR—West Penn.
PA—L. W. Hicks,.......Leechburg, Pa.
MS—L. W. Hicks, " "
S of H—Mules.
S of M—Hand.
EMP—55. Last fiscal year output 59,101 tons.

BAILEY, GEO. W. COMPANY.
General office, Lafayette Bldg., Philadelphia, Pa.
Priscilla No. 5 Mine; Drift; Miller Seam; 36 to 54 in. thick.
PO—Mineral Point, Pa; SP—Same CTY—Cambria; RR—Penn'a.
PR—Howard L. Merrick, Philadelphia, Pa.
TR—Howard G. Merrick, Philadelphia, Pa.
MS—A. G. Houston, Mineral Point, Pa.
S of H—Mules.
EMP—9. Last fiscal year output, 15,000 tons.
Note—Formerly operated by the Styer Coal Company.

BAKER, SAMUEL & SON
Bakers; Drift; Big Vein Bit. Seam; 96 in. thick.
PO—Boynton, Pa.; SP—Same; CTY—Somerset; RR—B. & O.; Grassy Run Branch.
PR—Samuel Baker ......Boynton,, Pa.
TR—C. H. Baker " "
GM—C. H. Baker " "
GS—C. H. Baker " "
PA—C. H. Baker, " "
S of H—Mules.
S of M—Hand.
EMP—12. Daily output about 100 tons.

BAKER-HAWK MINING COMPANY
See Memacolin Coal Co.

BAKER-WHITELEY COAL CO.
General Office, Keyser Bldg., Baltimore, Md.
Elma Nos. 1 and 2; Drift; "B" Seam 3 ft. 8 in. to 4 ft. thick
PO—Hooversville, Pa.; SP—Same; CTY—Somerset; RR—B. & O., S. M. Div
PR—James S. Whiteley..Baltimore, Md.
TR—Geo. A. Smith, " "
GM—Chas. H. Brown..Hooversville, Pa.
EE—E. Harshberger, " "
MS—John B. Hughes, " "
SCO—Calvert Supply Co., Buyer, J. D. Yost, Hooversville, Pa.
S of H—5 Elec. loco., track gauge 36 in.
S of M—4 Elec. mach. and hand.
PP—4 Return tubular boilers total 600 H. P., 2 gen. units 550 volts D. C., 2 pumps.
EMP—315. Last year output 201,000 tons.

BALDAUF COAL & COKE CO.
General Office, Punxsutawney, Pa.
Baldauf No. 1 Mine; Drift; Lower Kittanning Seam, 36 in. thick.
PO—Stratonville, Pa.; SP—Same; CTY—Clarion; RR—L. E. F. & C.
PR—J. H. Fink....Punxsutawney, Pa.
TR—J. H. Fink, " "
GM—J. M. Harvey...Strattonville, Pa.
PA—J. M. Harvey, " "
MS—J. M. Harvey, " "
SCO—Brush Run Supply Co. Buyer J. M. Harvey, Strattonville, Pa.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
EMP—10. Last fiscal year output 5,000 tons.

BALD HILL COAL COMPANY.
Bald Hill Mine; E. Seam 36 to 60 in thick.
PO—Lecontes Mills Pa; SP—Bald Hill (Prepay) CTY—Clearfield. RR—N. Y. C. River Line, Bald Hill, Br.
PR—Pembrandt Peale, New York, N. Y.
TR—John Peale, St. Benedict, Pa.
GM—Richard Peale, St. Benedict, Pa.
GS—Richard H. George, Winburne, Pa.
PA—G. E. Metzger, St. Benedict, Pa.
MS—A. Mont[illegible], Lecontes Mills, Pa.
CE—Merritt Hutton, St. Benedict, Pa.
EM—P. V. Reilly, " " "
MM—E. K. Davis, " " "
EE—E. K. Davis, " " "
SCO—Bald Hill Supply, Lecontes Mills, Pa. Buyer, E. T. Harvey, Lecontes Mills, Pa.
S of H—2 elec. Locos. Track gauge 36 inches.
S of M—4 elec. machs.
PP—Purchase Power.
EMP—60. Daily output 300 tons.

BANKS COAL COMPANY
General Office, Punxsutawney, Pa.
Burtner No. 1 Mine; Drift; B Seam; 46 to 52 in. thick.
PO—Sidney, Pa.; SP Same; CTY—Indiana; RR—Penna., Bellwood.
PR—H. G. Bowers,...Punxsutawney, Pa.
GM—H. G. Bowers, " "
GS—W. A. Bowers, " "
PA—H. G. Bowers, " "
TR—George W. Fink, " "
CE—Kanarr & McCartney, " "
MS—James Pratt, " "
MM—Joseph Sample.......Sidney, Pa.
SCO—Sidney Supply Co. Buyer, W. A. Rhoads, Sidney, Pa.
S of H—2 elec. locos. Track gauge 36 in.
S of M—4 elec. mach.

(Continued on Next Page.)

Banks Coal Co.—Cont.
PP—2 Erie return tubular boilers, total 250 H. P., 500 volts D. C., 1 pump.
EMP—154. Last fiscal year output 101,076 tons.

BANNER COAL MINING CO.

General Office, 617 Munsey Bldg., Baltimore, Md.
Banner No. 1 Mine; Drift; Lower Kittanning or "B" Seam, 34 to 36 in. thick.
PO—Osceola Mills, Pa.; SP—Same; CTY—Clearfield; RR— P. R. R., Moshannon & Clearfield Br.
PR—C. Francis Brown, Baltimore, Md.
TR—Horace Brown, " "
PA—C. B. Maxwell....Morrisdale, Pa.
MS—J. B. Maxwell, Osceola Mills, Pa.
S of H—1 Elec. loco.
S of M—Hand.
PP—2 pumps. Power purchased.
NOTE—Purchased the Peerless No. 4 Mine from the Dollie Coal Mining Company.

BANNING-CONNELLSVILLE COKE CO.

Wineland Mine, Drift, Pittsburgh Seam, 96 in. thick.
PO—Banning, Pa.; SP—Same; CTY—Fayette; RR—B. & O.
PR—Elias Wineland..Philadelphia, Pa.
TR—R. W. Gilmore.....Uniontown, Pa.
GM—J. W. Abraham, " "
PA—J. W. Abraham, " "
GS—J. W. Abraham, " "
MS—John F. McArdle,...Banning, Pa.
MM—H. L. Burchinall, " "
EE—H. L. Burchinall, " "
EM—H. L. Burchinall, " "
SCO—Wineland Supply Co. Buyer, W. N. Pravin, Banning, Pa.
S of H—Mules; 1 steam loco.; track gauge 42 in.
S of M—Hand.
PP—250 volts A. C. Buy power.
EMP—90. Last fiscal year output 60,000 tons; 76 Beehive coke ovens.
Sales Agent, R. W. Gilmore, Uniontown, Pa.

BARNES, JOHN & SONS.

Lancashire No. 2 Mine. CTY—Clearfield.
GS—E. H. Hughes......Philipsburg, Pa.
State report.

BARNES & TUCKER CO.

General Office, Harrison Bldg., Phila., Pa
Lancashire Nos. 10 and 12; Drift; "D" and "E" Seam, 3 ft. 8 in. to 5 ft. thick.
PO—Barnesboro, Pa.; SP—Same; CTY—Cambria.
PR—John Barnes..........Phila., Pa
GM—John Barnes, " "
TR—H. E. Bird, " "
PA—J. T. Slinger....Barnesboro, Pa.
MM—Owen Harris, " "
EE—Owen Harris, " "
MS—Richard Todhunter, " "
SCO—Barnes & Tucker Store Co., Buyer, C. T. Griest, " "
CE—C. Schlicher......Spangler, Pa.
S of H—11 Elec. loco., track gauge 42 in.
S of M—Hand and elec. machines.
PP—5 water tube boilers, total 1,150 H. P., 2 gen. units 250 volts D. C and 5 pumps.
EMP—520. Last fiscal year output 415,361 tons.
Sales Agency, address the Phila. office.

BARNET COAL CO.

Brisbin, Pa. No report.

BEACHLY COAL CO.

General Office, Johnstown, Pa.
Beachly Mine, Drift, C Prime Seam, 3 1-2 to 4 1-2 ft. thick.
PO—Beachly, Pa., SP—Same, CTY—Somerset.
RR—B. & O., White Creek Branch.
PR—A. B. Crichton.....Johnstown, Pa.
GS—C. G. Masters......Beachly, Pa.
EM—C. H. Gates, " "
CE—Andrew B. Critchton, Johnstown, Pa.
SCO—Masters Supply Co., Beachly, Pa. Buyer, C. G. Masters, " "
S of H—Rope; track gauge 40 inches.
S of M—Hand, and 6 comp. air mach.
PP—Erie boiler, 150 H.P., 2 Engines. 1 air compressor.
EMP—50.
Last fiscal year output 30,800 tons.
Sales Agent, A. B. Crichton, Johnstown, Pa.

BEAR ROCK COAL CO.

Bear Rock Colliery No. 1; Drift and Slope; "B" Seam; 45 to 50 in. thick.
PO—Lilly, Pa., SP—Bens Creek, Pa.; CTY—Cambria; RR—P. R. R., Main Line.
PR—John Leahey (owner)..Lilly, Pa.
GM—H. M. Leahey, " "
PA—H. M. Leahey, " "
GS—Edw. Leahey, " "
S of H—Mules, 3 Steam, 1 gasoline loco., and rope; track gauge 36 in.
S of M—Hand.
PP—5 Erie Water tube boilers, total 450 H. P., 2 gen. units, 2 pumps.
EMP—85.

BEAVER CANNEL COAL CO.

Darlington, Pa. No report.

BEAVER COAL CO.

Beaver No. 1 Mine; Drift; "D" Seam, 38 in. thick.
PO—Spangler, Pa.; SP—Barnesboro, Pa.; CTY—Cambria; RR—P. R. R., Gardner Run Br.
PR—D. B. Beaver......Spangler, Pa.
GS—D. B. Beaver, " "
TR—L. W. Maurer........Patton, Pa.
PA—L. W. Maurer, " "
S of H—Rope and mules.
S of M—7 Comp. air mach. and hand.
PP—1 Water tube boiler, total 80 H. P., 1 compressor.
Last fiscal year output, 50,000 tons.
Sales Agent, L. W. Maurer, Patton, Pa.

BEAVER COAL & COKE CO.

Beaver Mine No. 6; Drift; Kittanning Middle Seam; 36 to 42 in. thick.
PO—Wampum, Pa.; SP—Same; CTY—Lawrence; RR—P. R. R., E. & H. Div.
PR—G. L. Patterson, New Castle, Pa.
GM—H. K. Hartsuff....Wampum, Pa.
PA—H. K. Hartsuff, " "
MS—J. H. Larning, " "
MM—J. H. Larning, " "
CE—G. B. Zahnizer, New Castle, Pa.
EM—G. B. Zahnizer, " " "
S of H—Mules and 1 Elec. loco.; track gauge 37 in.
S of M—Hand, 3 elec. machines.
PP—2 Return tubular Erie City Iron Works Boilers, total 160 H.P., 1 gen. unit, 250 volts D.C.
EMP—6. Last fiscal year output 1420 tons.

BEAVER RUN COAL CO.

General Office, 916 Penn Bldg., Philadelphia, Pa.
Beaver Mine, Slope and Drift, E. Lennon Seam, 3¼ to 4 ft. thick.
PO—Beaverdale, Pa. SP—Lloydell, Pa. CTY—Cambria; RR—P. R. R., South Fork Branch.
PR—N. D. Cortright, Mauch Chunk, Pa.
TR—W. A. Cortright.....Beverly, N. J.
GS—I. A. Boucher.....Beaverdale, Pa.
PA—I. A. Boucher, " "
EM—A. B. Creichton, Johnstown, Pa.
SCO—Beaver Store Co., Buyer, H. L. Heilman, Beaverdale, Pa.
S of H—Rope, mule and 2 elec. loco.; track gauge 3½ ft.
S of M—Hand and 7 elec. and 4 comp. air mach.
PP—2 Erie Return Tubular Boilers., total 220 H. P., 1 gen. unit, 210 volts A. C., 3 pumps.
EMP—225. Last fiscal year output 150,000 tons.
Sales Agent, Cortright Coal Co., Philadelphia, Pa.

BECCARIA OPERATION.

General office, 1110-15 Penn Square building Philadelphia, Pa.
Beccaria No. 1 and 4 Mines; Drifts; E Veins; 30 to 34 in. thick.
PO—Glassgow, Pa.; SP—Same; CTY—Cambria; RR— Penna.
GS—H. L. Cannon, .. Glasgow, Pa.
MS—H. L. Cannon, " "
PA—F. Frank Bartholomew, Philadelphia, Pa.
S of H—Mules & Rope. Track gauge 36 inches.
S of M—Hand.
PP—2 Return tubular Boilers total 200 H. P.
EMP—90. Last fiscal year output 32,363 tons. Coke ovens, 80 Bee Hive.

BELLE VERNON COKE CO.

General Office, Oliver Bldg, Pittsburg, Pa.
Belle Vernon Mine; Drift; Pgh. Seam, 78 to 84 in. thick.
PO—Belle Vernon, Pa.; SP—Same; CTY—Fayette; RR—P. & L. E., P. R. R.
PR—J. H. Hillman......Pittsburg, Pa.
GM—W. L. Affelder, " "
PA—Jos. M. Leithead.... " "
MS—M. C. Nairn....Belle Vernon, Pa.
EE—James Dewalt, " " "
SCO—Belle Vernon Merc. Co.,
EM—E Gebhard........Masontown, "
S of H—Elec. motor; track gauge, 42 in.
S of H—Hand.
PP—Power purchased.
EMP—65. Last fiscal year output 19,020 tons.

BELLFIELD COAL & COKE CO.

General Office, 35 Central Trust Bldg., Altoona, Pa.
Bend No. 5 Mine, Slope, Miller Seam, 4 ft. 2 in. to 3 ft. 10 in. thick.
PO—Blandburg, Pa.; SP—Figart, Pa.; CTY—Cambria; RR—P. R. R., Stroud Branch.
PR—E. E. Davis.......Johnstown, Pa.
TR—F. P. McFarland....Altoona, Pa.
GM—F. P. McFarland, " "
MS—F. P. McFarland, " "
PA—F. P. McFarland, " "
EM—Jos. S. Sillyman & Co., " "
SM—C. E. Martz......Blandburg, Pa.
S of H—Mules; track gauge 3 ft.
S of M—Hand.
EMP—45. Last fiscal year output 23,000 tons.
Sales Agent, F. P. McFarland, Altoona, Pa.

BELLMORE COAL CO.

Bellmore No. 2 Mine, Drift, "D" Seam, 2 ft. 4 in. to 4 ft. 8 in. thick.
PO—Burnside, Pa.; SP—Same; CTY—Clearfield; RR—N. Y. C.
PR—E. E. Kantz........Burnside, Pa.
GM—E. E. Kantz, " "
TR—S. N. Wigton......Philipsburg, Pa.
PA—S. N. Wigton, " "
GS—E. E. Kantz........Burnside, Pa.
S of H—Mules; track gauge 3 ft.

BELLS MILL COAL CO.

Bells Mill; Drift; "B" or L. Kittanning Seam; 3 ft. 8 in. thick.
PO—Blairsville, Pa.; SP—Josephine, Pa. CTY—Indiana. RR—B. R. & P., P.R.R Clearfield & Cresson Div.
PR—J. W. Campbell.......Phila., Pa.
TR—Wilber P. Graff ..Blairsville, Pa.
GM—F. M. Graff, " "
PA—F. M. Graff, " "
MS—Ernest Fletcher....Saltsburg, Pa.
CE—Albert Smith, " "
S of H—Mules and rope, track gauge 42 in.
S of M—12 Comp. air mach. and hand.
PP—2 Erie Return tubular boilers, total 275 H. P., 1 haulage engine; 1 comp. and 3 pumps.
EMP—92. Last fiscal year output 51,771 tons.
Sales Agent, Knickerbocker Fuel Co., New York, N. Y.

BEN FRANKLIN COAL CO.

General Office, Freeport, Pa.
2 Mines in Pa; 1 mine in W. Va.
Braeburn and Metcalf Mines, Drift, Up. Freeport Seam, 4½ to 5 ft. thick.
PO—Braeburn, Pa.; SP—Same; CTY—Westmoreland; RR—B. & A. V.
PR—M. J. McQuade..Moundsville, W.Va.
GM—M. J. McQuade, " "
GS—M. J. McQuade, " "
PA—M. J. McQuade, " "
MS—Thos. McQuade ....Braeburn, Pa.
S of H—3 Elec. loco.; track gauge 42 in.
S of M—5 Elec. mach.
PP—3 Return tubular boilers, total 450 H. P., 2 gen. units, 250 volts D. C.

BENS CREEK COAL MINING CO.

General Office, Altoona, Pa.
Plane Mine, Drift, "E" or Leamon Seam 4 ft. thick.
PO—Lilly, Pa.; SP—Same; CTY—Cambria; RR—P. R. R., Bens Creek Br.
PR—John A. Leap ....Lilly, Pa.
GM—John A. Leap, " "
PA—John A. Leap, " "
MS—John A. Leap, " "
CE—Jos. S. Sillyman....Altoona, Pa.
S of H—Mules and gravity; track gauge, 36 in.
S of M—Hand.
EMP—40. Last fiscal year output 24,000 tons.

BERLIN SMOKELESS COAL & CLAY CO.

Smokeless or Top Coal Seam; 48 to 66 in. thick.
PO—Macdonaldton, Pa.; SP—Same; CTY—Somerset; RR—B. & O.
PR—A. J. Hillegass.......Berlin, Pa.
GS—A. J. Hillegass, " "
SM—A. J. Hillegass, " "
TR—H. E. Landis, " "
GM—W. H. Miller, " "
PA—W. H. Miller, " "
MS—H. L. Gray.....Macdonaldton, Pa.
CE—J. M. Cable, " "
EM—J. M. Cable, " "
S of M—Hand.

BERMOSHAN COAL COMPANY

Bermoshan No. 1 Mine; Drift; Moshannon or "D" Seam, 30 in. thick.
PO—Ramey, Pa.; SP—Same; CTY—Clearfield; RR—Penna. & P. & S., P. R. R. Branch.
TR—P. E. Womelsdorff, Philipsburg, Pa.
GM—G. F. Dunkle " "
EM—Womelsdorff & Dunkle " "
Note—Formerly Eureka No. 16 Mine of the Berwind-White Coal Mining Co.

BERTHA COAL COMPANY

General Office, 2406—1st Natl. Bank Bldg., Pittsburgh, Pa.
Bertha Mine; Drift; Pittsburgh Seam; 62 to 68 in. thick.
PO—Burgettstown, Pa., R. F. D. No. 3; SP—Dinsmore, Pa.; CTY—Washington; RR—P. C. C. & St. L.
PR—J. E. Stewart ....Pittsburgh, Pa.
GM—J. E. Stewart " "
PA—J. E. Stewart " "
TR—D. C. Eaton " "
GS—Wm. L. McCoy, Burgettstown, Pa.
CE—M. D. Gibson " "
EM—M. D. Gibson " "
SCO—Four States Supply Co.
S of H—Mules and 2 elec. locos. Track gauge 42 in.
S of M—7 elec. mach.
PP—1 pump, 1 gen. unit, 275 volts D. C. Purchase power.
EMP—160. Sales Agency, Bertha Coal Co.
New Mine.

BERWIND-WHITE COAL MINING CO.

General Office, Commercial Trust Bldg., Philadelphia, Pa.
PR—Edward J. Berwind, No. 1 Broadway, New York.
TR—H. C. Middleton....Phila., Pa.
GM—Thos. Fisher, " "
PA—W. W. Whitney, " "
GS—J. D. Simpson......Windber, Pa.
Cons. EE—Geo. R. Wood...Phila., Pa.
Efficiency Engr—C. E. Watts, Windber, Pa.
Chief Engr—E. A. Delaney, " "
MM—H. Lehman, " "
ME—M. C. Benedict, " "
SCO—Eureka Stores Co., Buyer, G. A. Smith, Windber, Pa.

Eureka Nos. 30, 31, 34, 35, 35½, 36, 37, 39, 40, 42; Drifts; Miller Seam;
PO—Windber, Pa. SP—Same. CTY—Somerset and Cambria. RR—P.R. R., South Fork Branch.
S of H—78 Elec. loco.
S of M—226 Elec. and 188 comp. air machines.
PP—3 Central Power Plants contain the following equipment: 1 5000 K. W. and 4 1,500 K. W.units, A. C. voltage up to 13200 on long transmission lines. Eight sub-stations where rotary converters, motor generators sets and transformers reduce the voltage to 550 volts D. C. and 440 volts A.C.; 1-400 K.W. Portable sub-station; 550 volts D.C. 4-400 K.W. D.C. 550 volts generators; driven by C.&G. Cooper Cross Compound Corliss Condensing engines; 3 motor driven compressors direct connected to 300 H.P. 6600 volt A. C. motor driven compressors, driven air compressors, 3-600 H.P. steam driven air compressors, 22 300 H.P. and 4-600 H.P. Stirling water tube boilers.
EMP—4,200.

Eureka Mines Nos. 28 and 29; Shafts; "B" or Miller Seam; 48 in. thick.
PO—Houtzdale, Pa.; SP—Same; CTY—Clearfield; RR—P. R. R., Tyrone Div.
MS—W. R. Cameron....Houtzdale, Pa.
S of H—Elec., loco.; track gauge 36 in.
S of M—Elec. mach.
PP—Gen. units, 500 volts D. C.

BESSEMER COAL & COKE CO.

General Office, Oliver Bldg., Pittsburgh, Pa.
Bessemer No. 1 Mine; Shaft; Freeport Seam, 7 ft. thick.
PO—Russellton, Pa.; SP—Same; CTY—Allegheny; RR—B. & L. E.
PR W. W. Keefer, Wabash Bldg., Pittsburgh., Pa.
TR—E. M. Love, " "
GM—F. S. Love, " "
GS—J. G. Bart ...... Russelton, Pa.
PA—F. C. Bortz.....Pittsburgh, Pa.
CE—M. P. Clark......Russellton, Pa.
EM—Robert McVicker....Russellton, Pa.
MM—J. M. Collier, " "
EE—Chas. Ganss, " "
SCO—Bessemer Supply Co., Russellton, Pa., buyer, Ambrose Eves.
S of H—5 Elec. locos., track gauge 42 in.
S of M—11Elec. mach.
PP—8 Return tubular boilers, total H. P. 1200; 2 gen. units, 550 volts A. C., 3 phase 60 cycles.
EMP—500. Last fiscal year output 584,000 tons.
Sales Agency, F. S. Love, 2212 Oliver Bldg., Pittsburgh, Pa.

BESSEMER COAL MINING CO.

General Office, Reynoldsville, Pa.
Drift Mine; Seam 48 in. thick.
PO—Hilliard, Pa.; SP—Argentine, Pa.; CTY—Butler; RR—B. & L. E.
PR—F. D. Smith, Reynoldsville, Pa.
GM—F. D. Smith, " "
TR—W. B. Alexander, " "
SECY—S. M. McKnight, " "
S of H—Elec. loco. and mules.
S of M—Elec. mach. and hand.
PP—3 Erie water tube boilers, 1 compressor, 1 pump.

BESSEMER COKE CO.
General Office, Oliver Bldg., Pgh., Pa.
PR—J. H. Hillman, Jr., Pittsburgh, Pa.
TR—A. B. Sheets, " "
GM—W. L. Affelder, " "
PA—Jos. M. Leithead, " "
EM—F. E. Gebhart.....Masontown, Pa.
SCO—Unity Supply Co., Buyer, M. P. Sullivan, Pittsburgh, Pa.
Sales Agency, J. H. Hillman & Sons Co., Pittsburgh, Pa.

Griffin No. 1 Mine, Drift, Connellsville Seam 90 to 102 in. thick.
PO—Masontown, Pa.; SP—Ifield, Pa.; CTY—Fayette; RR—P. R. R., Monongahela Div.
MS—D. R. DePriest....Masontown, Pa.
S of H—3 Elec. loco. and mules; track gauge 36 in.
S of M—Hand.
PP—Power furnished from Griffin No. 2 Mine.
EMP—300. Last fiscal year output 285,962 tons. Coke ovens, 200 rectangular.
Griffin No. 2 Mine, Slope, Connellsville Seam; 90 to 102 in. thick.
PO—Masontown, Pa.; SP—Ifield, Pa., CTY—Fayette; RR—P. R. R., Monongahela Div.
MS—A. N. Young......Masontown, Pa.
SM—C. L. Sangston, " "
S of H—Rope and mules; track gauge 36 in.
S of M—Hand.
PP—4 Return tubular boilers, total 725 H. P. 2 gen. units, 250 volts D. C., 1 comp. and 2 pumps.
EMP—200. Last fiscal year output 214,142 tons. Coke ovens, 196 Bee Hive.

Humphreys Mine, Slope, Connellsville Seam 84 to 108 in. thick.
PO—Greensburg, Pa., R.D. No. 6; SP—Trauger, Pa;. CTY—Westmoreland, RR—P.R.R, Sewickley Branch.
MS—A. B. Kelly......Greensburg, Pa.
SM—H. H. McDowell, " "
S of H—Rope; track gauge 44 in.
S of M—Hand.
PP—2 Return tubular boilers, total 300 H. P., 1 gen. unit,, 250 volts D. C., 2 pumps.
EMP—150. Last fiscal year output, 145,104 tons. Coke ovens, 145 Bee Hive.

BETZ COAL MINING CO.
Gen. Office, Betz Bldg., Phila., Pa.
Betz No. 2 Mine, Drift, "B" Seam, 4 to 5 ft. thick.
PO—Madera, Pa.; SP—Same; CTY—Clearfield.
PR—John F. Betz, 3rd, Philadelphia, Pa.
TR—Roberts Lowrie, " "
S of H—Mules.
S of M 9 comp. air mining mach.
PP 2 Return tubular boilers, total 200 H. P., 1 gen. unit, 1 comp.

BICKFORD FIRE BRICK CO.
Bickford Mine; Drift; "D" Seam; 40 in. thick.
PO—Curwensville, Pa.; SP—Same, CTY—Clearfield.
PR—H. T. Janney....Williamsport, Pa.
TR—J. W. Villinger, " "
GM—J. M. McKinley..Curwensville, Pa.
PA—Rosser Thomas, " "
GS—J. M. McKinley, " "
MS—F. M. Bailey, " "
MM—C. M. Wall, " "
CE—E. W. Hess........Clearfield, Pa.
S of H—Mules.
S of M—Hand.
EMP—37. Last fiscal year output 22,500 tons.

BIG BEND COAL MINING CO.
General Office, 1410 R. E. Trust Bldg., Philadelphia, Pa.
Nonpareil No. 1 Mine, Drift, Lower Kittanning Seam, 3.08 to 3.10 ft. thick.
PO—Expedit, Pa.; SP—Twin Rocks, Pa. CTY—Cambria; RR—P. R. R., Black Lick Br., Cresson Div.
PR—Theron I. Crane, Philadelphia, Pa.
TR—Wm. S. Pilling, " "
Sec'y—J. A. Jardine, " "
GM—Jos. W. Harrison.....Expedit, Pa.
GS—Jos. W. Harrison, " "
PA—Jos. W. Harrison, " "
SCO—Big Bend Supply Co., " "
S of H—5 Elec. loco.; track gauge 3 ft.
S of M—17 Elec. machines.
PP—5 Return tubular boilers, total 810 H. P., 3 gen. units, 250 volts D. C., 3 pumps.
EMP—250. Last fiscal year output 140,977 tons.
Sales Agents, Pilling & Crane, Phila. Pa,

BINDER COAL MINING COMPANY
General Office, Carrolltown, Pa.
Binder Mine; Drift; B or Miller Vein; 42 in. thick.
PO—Carrolltown, Pa.; SP—Bakerton, Pa.; CTY Cambria; RR Penna., Susquehanna branch.
PR—E. M. Binder......Barnesboro, Pa.
TR—C. C. Adams,....Carrolltown, Pa.
GM—James Green, " "
GS—James Green, " "
PA—Chas. Adams, " "
EM—O. T. Scollons, " "
S of H—Mules.
S of M—Hand.
Note—New mine started shipping coal Dec. 23rd, 1915.

BIRD COAL CO.
General Office, 718 Harrison Building, Philadelphia, Pa.
Bird No. 1 Mine; Slope; "C" Prime Seam, 60 to 66 in. thick.
PO—Johnstown, Pa.; SP—Same; CTY—Cambria; RR—B. & O.
PR—John Barnes....Philadelphia, Pa.
TR—John Barnes, " "
GM—John Barnes, " "
PA—John Barnes, " "
MS—R. Todhunter,.....Johnstown, Pa.
CE—Dickey & Co., " "
EM—Dickey & Co., " "
EE—O. Hannas, " "
S of H—Mules and 4 elec. loco. Track gauge, 42 in.
S of H—Hand.
PP—2 Return tubular boilers, total 200 H. P., 1 gen. unit, 250 volts D. C.
EMP—102. Last fiscal year output 155,000 tons.

BIXLER COAL & COKE CO.
General office, Fulton Bldg., Pittsburgh, Pa.
Little Glen Mine; Drift; Pittsburgh Seam; 72 to 80 in. thick.
PO—Adamsburg, Pa.; SP—Penns Station; CTY—Westmoreland; RR—B. & O., Hempfield Br.
PR—S. N. Birney......Pittsburgh, Pa.
TR—Ira. E. Bixler, " "
GM—Ira. E. Bixler, " "
PA—S. N. Birney, " "
MS—Robert Ainsley....Adamsburg, "
S of H—Elec. hoist and mules. Track gauge 42 in.
PP—Power purchased.
EMP—50. Last fiscal year output 40,300 tons. 40 Bee Hive Coke Ovens.

BLACK, A. J.
Nos. 1 and 3 Mines; Drift; Fulton and Barnett Seams; 2 to 5 ft. thick.
PO—Broad Top, Pa.; SP—Dudley, Pa.; CTY—Huntingdon. RR—H. & B. T. M.
GM—A. J. Black....Broad Top, Pa.
TR—A. J. Black, " "
PA—A. J. Black, " "
GS—N. W. Black, " "
SM—N. W. Black " "
MS—George Matheny, " "
CE—P. E. Wormelsdorf, " "
S of H—Mules and gasoline loco. Track gauge 36 in.
S of M—Hand.
EMP—100. Last fiscal year output 82,000 tons.

BLACK LICK MINING CO.
Out of business.

BLACK OAK COAL CO.
Olympia Mine has been sold to Walter J. Bennett, Syracuse, N. Y.

BLACK WATCH COAL COMPANY
General Office, 1031 Land Title Bldg., Philadelphia, Pa.
Black Watch No. 1 and 2 Mines; Drifts; "B" and "C" Seams.
PO—Osceola Mills, Pa.; SP—Same; CTY—Clearfield; RR—Penna.
PR—J. O. MacIntosh..Philadelphia, Pa.
TR—C. C. Renshaw, " "
GM—F. O. Renshaw, Osceola Mills, Pa.
S of H—Mules.
S of M—Hand.
Daily output, 50 tons.

BLAINE COAL CO.
General Office, House Bldg., Pittsburgh, Pa.
Blaine Mine; Drift; Pgh. Seam, 6 ft. thick; operate washery.
PO—Lock No. 3, Pa.; SP—Same; CTY—Allegheny; RR—P. & L. E.; Main Line.
PR—J. H. McCrady.....Pittsburgh, Pa.
TR—A. H. Stolzenbach, " "
GM—A. H. Stolzenbach, " "
PA—A. J. Soisson, " "
CE—Geo. S. Baton & Co., " "
SCO—Elizabeth Store Co. Buyer, S. A. Barnum, Elizabeth, Pa.
S of H—7-Elec. loco., rope and mules; track gauge 44 in.
S of M—14 Elec. mach.
PP—7 Return tubular boilers, total 1050 H. P., 7 gen. units and 4 pumps.
EMP—571. Last fiscal year output 561,520 tons.
Sales Agency, C. M. Budd, Pittsburgh, Pa.

BLAIR BROS. COAL CO.
General Office, Tyrone, Pa.
Orient Mines No. 3 and 4, Drift, "A" and "B" Seam, 3½ to 6 ft. thick.
PO—Powelton, Pa.. SP—Same; CTY—Centre; RR—P. R. R.
PR—C. F. Blair.
TR—S. S. Blair.
PA—S. S. Blair.
MS—S. B. Isenberg, Osceola Mills, Pa.
S of H Mules and gravity; track gauge 3 ft.
S of M—Hand.
EMP—32. Last fiscal year output 21,320 tons.

BLAIR COAL COMPANY
General Office, Indiana, Pa..
Kregar No. 1 Mine; Drift; C or Quemahoning Seam; 44 to 48 in. thick.
PO—Kregar, Pa.; SP—Jones Mills, Pa.; CTY—Westmoreland; RR—Indian Creek Valley, Blairs branch.
PR—David Blair,........Indiana, Pa.
TR—James S. Blair, " "
PA—James S. Blair, " "
GM—H. G. Smith........Kregar, Pa.
GS—H. G. Smith, " "
MS—D. S. Miller, " "
MM—John Slater, " "
CE—Mr. A. Smith........Kregar, Pa.
EM—Mr. A. Smith.......Kregar, Pa.
SCO—F. E. Phillippi Store. Buyer, F. E. Phillippi, Kregar, Pa.
S of H—Gravity.
S of M—Hand.
Note—Mine being developed.

BLAIR-CAMBRIA COAL COMPANY
General Office, Altoona, Pa.
Blair-Cambria No. 1 Mine; Drift; "C" Prime Seam; 62 to 67 in. thick.
PO—Dougherty, Pa.; SP—Same; CTY—Cambria RR—Altoona-Northern.
PR—S. Morris...........Altoona, Pa.
TR—W. N. Hare, " "
GM—W. N. Hare, " "
GS—W. N. Hare, " "
PA—W. N. Hare, " "
MS—John Howard, " "
CE—J. S. Sillyman & Co. " "
EM—J. S. Sillyman & Co. " "
SCO Dougherty Store Co. Buyer, C. Dougherty, Dougherty, Pa.
EMP—36. Last fiscal year output 22,214 tons.

BLAIR, JAMES S.
General Office, Indiana, Pa.
Brewster Mine; Drift; Middle Kittanning Seam; 36 in thick.
PO—Evans City, Pa.; SP—Same; CTY—Butler; RR—B. & O.
PA—J. S. Blair.........Indiana, Pa.
GM—J. S. Blair, " "
MS—James Robertson...Evans City, Pa.
S of H—Mules.
S of M—Hand.
EMP—20. Last fiscal year output 2400 tons.

BLAND, FRED, JR.
General office, Blandburg, Pa.
Fred Bland, Jr. Mine; Drift; E Seam; 30 in. thick.
PO—Blandburg, Pa; SP—Figart; CTY—Cambria; RR—Penn'a., Bellwood, Division.
PR—Fred Bland, Jr., .. Blandburg, Pa.
GM—Fred Bland, Jr. " "
PA—Fred Bland, Jr. " "
MS—Fred Bland, Jr. " "
SCO—Bland's Store, " "
S of H—Mules.
S of M—Hand.
EMP—15. Last fiscal year output, 12000 tons.

BLOSSBURG COAL CO.
General Office, Scranton, Pa.
PR—W. A. May.........Scranton, Pa.
TR—F. H. Wright, " "
GS—C. G. Richardson......DuBois, Pa.
PA—W. R. Collins...New York, N.Y.
EM—A. MacDonald......DuBois, Pa
SCO—H. H. Roberts Trading Co., Arnot, Pa.

Nos. 1, 2, 5, & Maple Hill Mine; Drift; Blossburg Seam, 2½ to 5 ft. thick.
PO—Arnot, Pa.; SP—Same; CTY—Tioga; RR—Erie, Tioga Div.
MS—R. E. Logan.........Arnot, Pa.
S of H—3 elec., 3 steam locos., and mules; track gauge 26 and 36 in.
S of M—Hand.
PP—5 Return tubular boilers, total 550 H. P., 1 gen. unit, 250 volts D. C.
EMP—525. Last fiscal year output 286,828 tons.

BOGGS COAL & MINING CO.
General Office, Kittanning, Pa.
Boggs No. 1 and 2 Mines; Drift; Lower Kittanning and Upper Freeport Seam; 48 to 54 in. thick.
PO—Kittanning, Pa.; SP—Same; CTY—Armstrong; RR—P. S. & N.
PR—W. H. Reynolds....Kittanning, Pa.
TR—A. W. Smith " "
GM—Auth Smith, " "
GS—Auth Smith " "
PA—Auth Smith " "
CE—Chas. F. Smith " "
MS—J. J. Sobiski " "
S of H—Mules. Track gauge 30 in.
S of M 2 elec. mach.
PP—440 volts A. C. Power purchased.

BOLIVAR COAL & COKE CO
Out of business.

BOWERSVILLE COAL CO.
General Office, Punxsutawney, Pa.
Bowersville Colliery Mine; Slope; Up. Freeport Seam; 48 to 52 in. thick.
PO—Bowersville, Pa.; SP—Same, CTY—Jefferson; RR—P. R. R.; Bellwood Div.
PR—S. A. Rinn....Punxsutawney, Pa.
TR—H. G. Bowers, " "
GM—H. G. Bowers, " "
PA—H. G. Bowers, " "
EM—Harry Knarr, " "
GS—W. N. Trusell, " "
MS—Madison Williams..Bowersville, Pa.
SCO—Hillman Supply Co., " "
S of H—3 elec. loco. Track gauge 42 in.
S of M—2 Elec. and 8 comp. air mach.
PP—3 Return tubular boilers, total 400 H. P., 2 gen. units, 2 comp. and 3 pumps.
EMP—120. Last fiscal year output 91,636 tons.

BOWMAN BROS. CO.
Fairview Mine, Drift, Pittsburgh Seam, 66 to 78 ins. thick.
PO—McKeesport, Pa.; CTY—Allegheny.
PR—S. M. Bowman.....McKeesport, Pa.
TR—T. H. Bowman, " "
GS—Adam Gephart, " "
PA—J. M. Lyle, " "
EE—Fred Lang, " "
S of H—Mules.
S of M—1 Elec. mach.
PP—Power purchased.
EMP—12. Last fiscal year output 8,790 tons. Coke ovens, 6 Bee Hive.

BOWMAN, C. K. & CO.
Chapman No. 1 and 2 Mines; Drifts; Redstone or Sewickley Seams; 52 in. thick.
PO—Boynton, Pa.; SP—West Salisbury, CTY—Somerset; RR—B. & O. Salisbury Br.
TR—C. K. Bowman......Boynton, Pa
GM—C. K. Bowman " "
PA—C. K. Bowman, " "
S of H—Mules. Track gauge 42 in.
S of M—Hand.

BOWMAN COAL MINING CO.
Bowman Mine; Drift; Pgh. Seam, 66 in. thick.
PO—Saltsburg, Pa.; SP—Same; CTY—Indiana. RR—P. R. R., Conemaugh Div.
PA—S. J. Robinson......Saltsburg, Pa.
MS—S. J. Robinson, " "
EM—Albert Smith, " "
S of H—Mules, track gauge 36 in.
S of M—Hand.
EMP—75.

BOYD, GEORGE E., COAL CO.
Elizabeth Mine; Drift; Freeport Seam, 46 to 52 in. thick.
PO—Tarentum, Pa.; SP—Edgecliff, Pa; CTY—Allegheny; RR—P. R. R., Conemaugh Div.
PR—Geo. E. Boyd......Tarentum, Pa.
TR—Geo. E. Boyd, " "
GM—George E. Boyd, " "
PA—George E. Boyd, " "
MS—J. E. Milson........Arnold, Pa.
S of H—1 Elec. loco.; track gauge 42 in.
S of M—2 elec. mach.
PP—Power purchased.
EMP—18. Last fiscal year output 11,000 tons.

BOYNTON COAL CO.
Chapman Nos. 3, 4 and Black Diamond Mines; Drift; Pgh. Seam, 86 in. thick.
PO—Elk Lick, Pa.; SP—West Salisbury, Pa.; CTY—Somerset; RR—B. & O., Salisbury Br.
PR—F. A. Maust........Elk Lick, Pa.
GM—F. A. Maust and H. H. Maust, Elk Lick, Pa.
PA—F. A. Maust and H. H. Maust, Elek Lick, Pa.
TR—H. H. Maust, " "
GS—Fred Wagner, " "
MS—Fred Wagner, " "
S of H—Mules.
S of M—Hand.
Last fiscal year output, 40,000 tons.

BRADENVILLE COAL & COKE CO.
General Office, Blairsville, Pa.
Bradenville Mine; Slope and drift; Pgh. Seam, 72 to 108 in. thick.
PO—Bradenville, Pa.; SP—Same; CTY—Westmoreland; RR—P. R. R., Main Line.
PR—F. M. Graff, ...Blairsville, Pa.
GM—M. W. Saxman.....Latrobe, Pa.
PA—M. W. Saxman, " "
TR—W. P. Graff, ...Blairsville, Pa.
GS—C. M. Cunningham, " "
MS—C. M. Cunningham, " "
CE—Albert Smith, ...Saltsburg, Pa.
SM—R. J. Bomblatus...Bradenville, Pa.
SCO—Kisimentas Supply Co. Buyer, M. G Fletcher, Blairsville, Pa.

(Continued on Next Page.)

Bradenville Coal & Coke Co —Cont.
S of H—Mules and rope; track gauge 36 in.
S of M—Hand.
PP—3 Return tubular boilers, total 325 H.P.
EMP—135. Coke ovens—244 Bee Hive.
Sales Agency, Knickerbocker Fuel Co.

BRADLEY & REED.
No. 3 Mine, Slope, "B" Seam.
PO—Gallitzin, Pa.; SP—Same; CTY—Cambria; RR—P. R. R.
PA—F. X. Bradley, ..Gallitzin, Pa.
SM—F. X. Bradley, " "
S of H—Rope.
S of M—Hand.
PP—Boiler, 30 H. P.

BRANDENBURG COAL MNG. CO.
Rockwood Mine; Drift; B. Seam; 30 in. thick.
PO—Rockwood, Pa.; SP—Same; CTY—Somerset; RR—B. & O.
PR—W. L. O'Brien........Bolivar, Pa.
TR—W. L. O'Brien, " "
GM—W. L. O'Brien, " "
GS—W. M. Fetters......Rockwood, Pa.
PA—W. M. Fetters, " "
CE—James Fluk.........Somerset, Pa.
EM—James Fluk, " "
EE—Parks & Co.
S of H—2 elec. locos. Track gauge 36 in.
S of M—1 elec. mach.
PP—2 Erie water tube boilers, total 300 H. P.
EMP—20. Last fiscal year output 8000 tons.
Note—Successors to Ivy Ridge Coal Co.

BRIER HILL COKE CO.
Brier Hill Mine, Shaft, Pittsburgh Seam.
PO—Brier Hill, Pa.; SP—Republic; CTY—Fayette; RR—Monongahela.
PR—W. H. Stambaugh..Youngstown, O.
TR—Jno. Todd, " "
GM—Thos. McCaffrey, Brier Hill, Pa.
PA—Thos. McCaffrey, " "
MS—Thos. McCaffrey, " "
SCO—Brier Hill Supply Co. Buyer, W. W. Higinbotham, Brier Hill, Pa.
S of H—4 comp. air loco.
S of M—Hand and 7 comp. air mach.
PP—5 boilers, total 1,500 H. P., gen. units, 250 volts D. C., 4 air. comp.
EMP—495. Coke ovens, 470. Last fiscal year output 326,723 tons.

BROAD TOP COAL & MINERAL CO.
General Office, Huntingdon, Pa.
Jacobs Mine, Drift.
PO—Jacobs, Pa.; SP—Same; CTY—Huntingdon. RR—East Broad Top. and J. & S.
PR—H. C. Ross........Harrisburg, Pa.
TR—W. M. Oglesby, " "
GM—Robt. F. Powers..Huntingdon, Pa.
PA—Robt. F. Powers, " "
EM—J. Murray Africa..Huntingdon, Pa.
MS—H. G. Cockill........Jacobs, Pa.
SM—J. O. McClain " "
S of H—Rope and mules and 1 gasoline loco.; track gauge 30 in.
S of M—Hand and 2comp. air mach
PP—1 Return tubular boiler, total 110 H. P., 1 air comp., 2 pumps.
EMP 120. Last fiscal year output, 80,000 tons.

BROTHERS VALLEY COAL CO.
Gen. Office, 90 West St., New York, N.Y.
PR—Henry B. Reed, " " "
TR—D. V. Reynolds, " " "
PA—B. A. Polhemus, " " "
GS—C. F. Roy......Macdonaldton, Pa.
EM—G. B. Fluck, " "
MM—A. L. Lowry, " "
EE—Chas. Brick " "
SCO—Pen Mar Supply Co. Buyer, A. C. Polhemus, MacDonaldton, Pa.
Sales Mgr., John M. Leonard.
New York City, N.Y.

Pen-Mar No. 2, Shaft, Miller Vein or "B" Lower Kittanning Seam 48 to 60 in. thick.
PO—Macdonaldton, Pa.; SP—Same; CTY—Somerset; RR—B. & O., Berlin Branch.
MS—M. S. Purcell..Macdonaldton, Pa.
S of H—Rope and 3 elec. loco. Track gauge 42 in.
S of M—10 comp. air and elec. mach.
PP—4 Boilers, 800 H. P., 1 motor gen. set, 4 comp. and 3 pumps. Power purchased.
EMP—251. Last fiscal year output 209,898 tons.

Pen-Mar No. 3 Mine; Slope; B. & L. Kittanning Seams; 54 to 60 in. thick.
PO—Macdonaldton; SP—Same; CTY—Somerset; RR—B. & O., Berlin Br.
MS—Patrick Purcell Macdonaldton, Pa.
S of H—3 Elec. loco.; track gauge 42 in.
S of M—2 elec. short Wall cutting mach.
PP—3 Boilers, 900 H. P., Motor gen. set, A. C. Power purchased.
EMP—315. Last fiscal year output 290,314 tons.

Pen Mar No. 4 Mine; Drift; B or Miller Vein; 48 to 60 in. thick.
PO—Macdonaldton, Pa.; SP—Same; CTY—Somerset; RR—B. & O., Berlin Branch.
PP—Power purchased.
S of H—Elec. loco. Track gauge 42 in.
S of M—Hand and 1 elec. mach.,
EMP—40.

BROWN BROS. COAL CO.
See Tyrone Fuel & Supply Co.

BROWN & COCHRAN.
Nellie Mine, Drift, Seam 9 ft. thick.
PO—Dawson, Pa.; SP—Dickerson Run, CTY—Fayette; RR—P. & L. E.
PR—W. Harry Brown....Pittsburgh, Pa.
TR—W. Harry Brown, " "
GM—J. S. Laughrey......Dawson, Pa.
PA—J. S. Laughrey, " "
GS—J. S. Laughrey, " "
CE—T. M. Zimmerman, " "
MM—Oliver Knight, " "
EE—Oliver Knight, " "
SCO—Jos. Cochran Store Co., Buyer, Paul Taggart, Vanderbilt, Pa.
S of H—Mules and elec. loco. Track gauge 54 in.
S of M—Hand.
PP—5 Erie water tube boilers, 1 gen. unit, 250 volts D. C., 2 phase, 60 cycles, 100 K. W., 2 pumps.
Last fiscal year output 500,000 tons.
Coke ovens, 100 Bee Hive.

BROWN, W. E. COAL CO.
General Office, Ligonier, Pa.
Darlington No 1 Mine; Drift; Upper Freeport Seam; 42 to 72 in. thick.
PO—Ligonier, Pa.; SP—Darlington; CTY—Westmoreland; RR—Ligonier Valley.
PR—I. F. Heaton........Viaduct, Pa.
GM—W. E. Brown.......Ligonier, Pa
GS—W. E. Brown, " "
PA—W. E. Brown, " "
MS—Jos W. Petrosky.....Ligonier, Pa.
S of H—Mules and gravity; track gauge 36 in.
S of M—Hand.
PP—1 boiler, 15 H. P., 2 pumps.
EMP—15. Last fiscal year output 16,500 tons.

BROWN, W. HARRY.
Alicia Mine, Seam 8¼ ft. thick.
PO—Alicia, Pa.; SP—Same; CTY—Fayette; RR—P.R.R., Mon. Div
PR—W. Harry Brown, owner.
GM—W. C. Reynolds.......Alicia, Pa
CE—C. E. Taylor.
SCO—Brown Supply Co., " "
S of H—3 Elec. and 1 steam loco.
S of M—7 Elec. mach.
PP—3 Boilers, total 1,125 H.P., 1 compressor and 1 pump.
EMP—550. Last fiscal year output 189.676 tons. Coke ovens, 400 Rectangular.
Sales Agent, C. F. Colbert, Jr.

BROWNFIELD CONNELLSVILLE COKE CO.
General Office, Uniontown, Pa.
PR—I. H. Brownfield...Uniontown, Pa.
TR—I. H. Brownfield, " "
GM—W. J. White, " "
PA—W. J. White, " "
GS—Wm. Beal, " "
EE—Sam Brownfield, " "
Sales Agency, Brownfield Coal & Coke Co., Uniontown, Pa.

Myers Mine; Drift; Pgh. Seam 8½ ft to 11 ft. thick..
PO—Tarr, Pa.; SP—Same; CTY—Westmoreland; RR—P.R.R.
MS—R. L. Goff..........Tarr, Pa
S of H—Mules and elec.; track gauge 44 in.
S of M—Hand.
PP—Purchase power, 1 pump.
EMP—19. Coke ovens 32; Bee Hive. Last fiscal year output 45000 tons.

Marie and Martha Mines; Drift and Slope; Sewickley Seam 5½ to 6½ ft. thick.
PO—Uniontown, Pa.; SP—Same; CTY—Fayette; RR—P.R.R.
MS—Wm Beal........Uniontown, Pa
S of H—Mules and rope; track gauge 44 in.
S of M—Hand.
PP—Power purchased 1 pump.
EMP—80. Last fiscal year output 105,000 tons.
(Old information.)

BROWNING COKE CO.
General Office, Uniontown, Pa
Browning No. 2 Mine; Drift; Pittsburgh Seam; 7 to 10 ft. thick
PO—Dunbar, R. D. 32; SP—Vance Mill Junction; CTY—Fayette; RR—Penna. Mono. Div. Bittner Br.
PR—A. O. Davis.......Uniontown, Pa.
GM—A. O. Davis, " "
MS—A. O. Davis, " "
TR—F. R. Hess, " "
S of H—Mules and 1 steam loco. Track gauge 44 in.
S of M—Hand.
EMP—21. Output for 2 months, 3000 tons.
Coke ovens 20 Bee Hive.
Sales Agents, Harris-Smith Coke & Coal Co., Uniontown, Pa.

BROWNSVILLE COKE CO.
General Office, Uniontown, Pa.
Magee Mine, Slope and Drift, Pgh. Seam, 9 ft. thick.
PO—R.F.D. No. 3, Latrobe, Pa.; SP—Brownsville; CTY—Westmoreland; RR—Monongahela.
PR—I. W. Semans.....Uniontown, Pa.
TR—I. W. Semans, " "
GM—J. W. Abraham, " "
GS—J. W. Abraham, " "
PA—J. W. Abraham, " "
CE—F. G. Christopher, " "
MS—Samuel Stone ....Brownsville Pa.
S of H—Elec.; track gauge 42 in.
S of M—Hand.
PP—Buy power.
EMP—48. Last fiscal year output 21,568 tons. Coke ovens, 50 Bee Hive.
Sales Agents, Producers Coke Co., Uniontown, Pa.

BRUIN COAL CO.
Bruin Mine, Drift, Seam 5 to 6 ft. thick.
PO—Bruin, Pa.; SP—Same; CTY—Butler; RR—B. & O., P. & W. Div.
PR—Don. Rose.
TR—Roy Rose.
GM—J. H. Thompson...Pittsburgh, Pa.
GS—J. H. Thompson, " "
PA—J. H. Thompson, " "
MS—W. G. Christy........Bruin, Pa.
EM—E. L. Burnside...Grove City, Pa.
S of H—Mules; track gauge 42 in.
S of M—Elec.
PP—Gas Engine, 85 H. P., 250 volts D. C., 1 pump.

BRUSH CREEK COAL MINING CO.
General Office, Punxsutawney, Pa.
PR—L. W. Robinson, Punxsutawney, Pa.
TR—F. H. Beck, " "
PA—H. C. Smith, " "
EE—L. W. Householder, " "
GM—F. M. Fritchman....Indiana, Pa.
CE—G. W. Brymer, " "
EM—Geo. Rodgers....Homer City, Pa.
SCO—Traders Supply Co. Buyer, J. F. Campbell, Indiana, Pa.

Waterman Mine; Drift; "B" Miller Seam.
PO—Waterman, Pa.; SP—Same; CTY—Indiana; RR—B. R. & P., Indiana branch.
MS—L. O. Mellinger...Waterman, Pa.
S of H—5 elec. locos. Track gauge 42 in.
S of M—8 elec. mach.
PP—10 pumps. Power purchased.

Luciusboro Mine; Drift; "E" Upper Freeport Seam.
PO—R. D. 1, Homer City, Pa.; SP—Luciusboro; CTY—Indiana; RR—B. R. & P., Indiana branch.
MS—W. K. Ray,
R. D. 1, Homer City, Pa.
S of H—4 elec. locos. Track gauge 42 in.
S of M—4 elec. mach.
PP—5 pumps. Power purchased.

Snyder Nos 1, 2 & 3 Mines; Drifts; "B" Miller Seam.
PO—Homer City, Pa.; SP—Snyder Mines, Homer City, Pa.; CTY Indiana; RR—B. R. & P., Indiana branch.
MS—M. M. Nolan, ...Homer City, Pa.
S of H—6 elec. locos. Track gauge 42 in.
S of M—8 elec. mach.
PP—1 pump. Power purchased.

Coy Mine; Drift; "E" Upper Freeport Seam.
PO—Homer City, Pa.; SP—Coy Mines, Homer City, Pa.; CTY—Indiana; RR—B. R. & P., Indiana branch.
MS—M. M. Nolan,... Homer City, Pa.
S of H—3 elec. locos. Track gauge 42 in.
S of M—5 elec. mach.
PP—Power purchased.

BRUSH RUN COAL & COKE CO.
Brush Run Mine, Slope, Pgh. Seam, 7½ ft. thick.
PO—Mt. Pleasant, Pa.; SP—Same; CTY—Westmoreland; RR—B. & O.
PR—J. S. Hitchman..Mt. Pleasant, Pa.
GM—J. D. Hitchman, " "
GS—R. E. Burns, " " "
MS—Sam Smith......Mt. Pleasant, Pa.
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—1 Return tubular boiler, 100 H.P.
EMP—34. Last fiscal year output 8,259 tons. Coke ovens, 30 Bee Hive.

BUFFALO & SUSQUEHANNA COAL & COKE CO.
General Office, Du Bois, Pa.
PR—James R. Caseley.....Du Bois, Pa.
GM—James R. Caseley, " "
PA—James R. Caseley, " "
GS—James Harvey, " "
CE—C. D. Oldknow, " "
TR—F. R. Lehr........Buffalo, N. Y.
SCO—Keystone Store Co. Buyer, A. R. McHenry, Sagamore, Pa.

Sagamore Mine—Drift, Up, Freeport Seam, 68 in. thick.
PO—Sagamore, Pa.; SP—Same; CTY—Armstrong; RR—B. & S.
MS—H. A. Moulder......Sagamore, Pa.
S of H—14 elec. loco. Track gauge 42 in.
S of M—72 Comp. Air mach.
PP—10 Water tube boilers, total 3500 H. P., 7 gen. units 550 volts D. C. 4 compressors, 4 pumps.
EMP—1011.

DuBois No. 1 Mine, Shaft, Lower Freeport Seam.
PO—DuBois, Pa. SP—Same. CTY — Clearfield. RR—B. & S.
MS—Wm. Chick, ... DuBois, Pa.
S of H—2 elec. mach.
S of M—Comp. air.
PP—9 boilers, total 1,200 H. P., 5 gen. units, 500 volts D. C.
EMP—350.

DuBois No. 2 Mine, Shaft, Lower Freeport Seam.
PO—DuBois, Pa. SP—Same. CTY — Clearfield. RR—B. & S.
MS—Hugh McCutcheon,.. DuBois, Pa.
S of H—5 elec. loco.
S of M—Comp. air.
PP—7 boilers, total 2100 H. P., 250 volts D. C.
EMP—550.

BULAH SHAFT COAL CO.
PR—John H. Minds, Philadelphia, Pa.
TR—W. R. Minds, 120 Broadway, N. Y.
GM—Jas. H. Minds.......Ramey, Pa.
PA—Jas. H. Minds, " "
EM—Womelsdorff & Dunkel,
Philipsburg, Pa.
SCO—W. R. Minds & Co., New York City, Buyer, W. C. Schwamb, Ramey, Pa.
Sales Agents, Bulah Coal Mining Co., 120 Broadway, New York City.

Bulah Shaft No. 1, Shaft, "D" or Moshannon Seam, 6 to 3 ft. thick.
PO—Ramey, Pa.; SP—Same; CTY—Clearfield; RR—P.R.R., P. & S. of N.Y.C.
S of H—Mules and 4 elec. loco. Track gauge 36 in.
S of M—Hand and 6 elec. mach.
PP—4 Erie water tube boilers, 2 gen. units, 1—150 K. W., 1—200 K. W., 250 volts D. C.
EMP—250. Last fiscal year output 175,988 tons.

Webster No. 4, Drift, "D" or Moshannon Seam, 6 to 3 ft. thick.
PO—Ramey, Pa.; SP—Same; CTY—Clearfield; RR—P.R.R.
S of H—Mules; track gauge 3 ft.
S of M—Hand.
PP—2 Water tube boilers, 2 gen. units.
EMP—49. Last fiscal year output 23,261 tons.

BULGER BLOCK COAL CO.
Gen. Office, 6366 Frankstown Ave., Pittsburgh, Pa.
Bulger Mine, Shaft, Pittsburgh Seam, 5½ ft. thick.
PO—Bulger, Pa.; SP—Same; CTY—Washington; RR—P.C.C. & St. L.
PR—D. J. Kennedy....Pittsburgh, Pa.
TR—S. C. Orr. " "
GM—D. J. Kennedy, " "
GS—D. J. Kennedy, " "
PA—D. J. Kennedy, " "
CE—Andrews & Southard, " "
EM—Andrews & Southard, " "
MM—Fred Culp............Bulger, Pa.
EE—Wm. Jameison.........Midway, Pa.
MS—Leon Randnour........Bulger, Pa.
S of H—3 Elec. loco.; track gauge 42 in.
S of M—12 Elec. machines.
PP—3 Monroe Return Tubular Boilers, total 450 H.P., 2 gen. units, 2300 volts A. C., 3 phase, 60 cycles, and 200 volts D. C., 2 pumps.
EMP—350. Last fiscal year output 235,879 tons.
Sales Agent, J. W. Woomer, Pgh., Pa.

BURNS, M.
General Office, Houtzdale, Pa.
PR—M. Burns ....Houtzdale, Pa.
TR—M. Burns, " "
GM—Wm. Burns, " "
PA—W. M. Burns, " "
SCO—Grampian Supply Co., Buyer, J. W. Scurman, Grampian, Pa.

Sales Agent, Wm. Burns, Houtzdale, Pa.

Penn No. 3 Mine, Drift, D. & E. Seam, 4 ft. thick.
PO—Grampian, Pa.; SP—Same; CTY—Clearfield; RR—P.R.R., Penn Br.
MS—H. P. Burns.......Houtzdale, Pa.
S of H—Mules.
S of M—Hand.
PP—1 Pump.
EMP—68. Last fiscal year output 36,000 tons.

Penker Mine, Drift, D. & B. Seam, 4 to 4½ ft. thick.
PO—Puritan, Pa.; SP—Same; CTY—Cambria; RR—P.R.R.
MS—Mr. McLarney, ... Puritan, Pa.
S of H—Mules.
S of M—Hand.
EMP—85.

Penn No. 1 Mine, Drift and Slope; "D" Moshannon Seam, 5 ft. thick.
PO—Houtzdale, Pa.; SP—Same; CTY—Clearfield; RR—P.R.R., M. & C. Branch.
MS—M. Burns ....Houtzdale, Pa.
S of H—1 Gasoline motor, mules and rope; track gauge 3 ft.
S of M—Hand.
EMP—31. Last fiscal year output 32,000 tons.

BURTNER, C. P.

Claire Mine, Slope, Lemon "E", Seam 3 1-2 to 4 1-2 ft. thick.
PO—Ashville, Pa., SP—Same, CTY—Cambria.
RR—Penna. R. R.
GM—C. P. Burtner......Altoona, Pa.
MS—John St. John,.....Ashville "
EM—Jos. S. Sillyman & Co., ..Altoona, Pa.
SCO—Ashville Supply Co.
Buyer—John St. John....Ashville, Pa.
S of H—Mule and rope, track gauge 36 in.
S of M—Hand.
PP—1 150-H. P. boiler, Altoona.
EMP—125.
Sales Agent, C. P. Burtner.

BUTLER JUNCTION COAL CO.

Butler Junction Mine, Drift.
PO—Leechburg, Pa. SP—Butler Jct. CTY—Armstrong. RR—West Penn.
GM—L. W. Hicks, ..Leechburg, Pa.
PA—L. W. Hicks, " "
MS—Wm. Gilson, " "
EM—E. A. Watters, " "
S of H—Elec. loco.
S of M—Hand.
EMP—67. Last fiscal year output 84,377 tons.

BYRNE COAL & COKE CO.

General Office, Scottdale, Pa.
Virgie Mine; Drift; Irwin Seam, 96 in. thick.
PO—Yukon, Pa.; SP—Same; CTY—Westmoreland; R.R.—P R. R., Yukon Branch.
PR—Francis W. Byrne, Scottdale, Pa.
TR—Arthur L. Byrne, " "
GM—Ed. Byrne, " "
GS—Ed. Bryne, " "
MS—Ed. Bryne, " "
CE—E. C. McCullough, Uniontown, Pa.
MM—Geo. Keller..........Arona, Pa.
EM—Robert Collins.....Uniontown, Pa.
SCO—Superior Supply Co., Madison, Pa., Buyer, Ed. Bryne, Scottdale, Pa.
S of H—Mules and 1 elec. loco.
S of M—3 Goodman elec. mach.
PP—1 motor generator set, 250 volts D. C., 2 pumps. Power purchased.
EMP—147. Daily output 800 tons. Coke ovens, 34 Bee Hive.

JAMES BYRNE & CO.

Finley Mine; Drift; Lower Connellsville Seam; 96 in. thick.
PO—New Salem, Pa.; SP—Same; CTY—Fayette; RR—M. R. R.
PR—James Byrne........Everson, Pa.
TR—F. W. Byrne " "
GM—James Byrne " "
PA—James Byrne " "
S of H—Mules.
S of M—Hand.
PP—1 return tubular boiler, total H. P. 30.
EMP—30. 32 Bee Hive coke ovens.

CAMBRIA-SMOKELESS COAL COMPANY.

General Office, Johnstown, Pa.
Cambria No. 1 Mine; Drift; Miller or B Seam; 42 to 54 in. thick.
PO—Coalport, Pa.; SP—Same; CTY—Clearfield; RR—Pennsylvania.
PR—Frank D. Baker....Johnstown, Pa.
TR—Chas. A. Owen, " "
GM—Chas. A. Owen, " "
PA—Chas. A. Owen, " "
MS—George Forsythe ......Coalport, Pa.
S of H—4 elec locos. Track gauge 42 in.
S of M—6 elec. mach.
PP—1 Gen. Units, 250 Volts D. C., (Pump delivering water to the surface; Power purchased.

EMP—160.
Sales Agt., B.E.Taylor, Brockwayville, Pa.
Successors to Blain Run Coal Co.

CAMBRIA STEEL CO.

General Office, Widener Bldg., Philadelphia, Pa.
PR—A. C. Dinkey, Widener Bldg., Philadelphia, Pa.
PA—F. C. Yeates......Pittsburgh, Pa.
TR—D. B. Gehly....Philadelphia, Pa.
GM—E. E. Slick, .. Johnstown, Pa.
ASST GS OF M—Henry Lubkin, Johnstown, Pa.
EM—M. G. Moore, " "
MM—C. J. Hannigan, " "
EE—C. W. Parkhurst, " "

Rolling Mill Mine, Drift, Cement Seam, 3½ to 4 ft. thick Operate washery.
PO—Johnstown, Pa. SP—Same. CTY—Cambria. RR—P. R. R. and B. & O.
MS—John Broderick....Johnstown, Pa.
S of H—Mules, rope, 7 comp. air and 1 storage battery loco. Track gauge 36 in.
S of M—Hand and 52 comp. air mach.
PP—8 B. & W. water tube boilers, total 2200 H. P., 6 air comp., 4 pumps.
EMP—651. Last fiscal year output 651,164 tons.

Franklin No. 1 Mine; Drift; Cement Seam; 3 to 4 ft. thick.
PO—Johnstown, Pa. SP—Same. CTY Cambria. RR—P. R. R. and B. & O.
MS—Frank Boyd.......Johnstown, Pa.
S of H—Rope and 7 elec. locos. Track gauge 45 in.
S of M—8 elec. mach.
PP—From Steel Works, Central Plant.
EMP—374. Last fiscal year output 496,704 tons. Coke ovens, 370.

Franklin No. 2 Mine; Slope; Miller "B" Seam; 36 to 48 in. thick.
PO—Johnstown, Pa.; SP—Same; CTY—Cambria; MS—Frank Boyd, Johnstown, Pa.
S of H—6 elec. locos. Track gauge 45 in.
S of M—8 elec. mach.
PP—2 pump. Receive power from Steel Works Central Plant.
EMP—220. Last fiscal year output 256,413 tons.

Franklin No. 3 Mine; Drift; Cement "C" Seam; 36 to 42 in. thick.
PO—Johnstown, Pa.; SP—Same; CTY—Cambria.
MS—Frank Boyd.......Johnstown, Pa.
S of H—1 elec. loco. Track gauge 45 in.
S of M—1 elec. mach.
PP—Receive power from Steel Works Central plant.
EMP—22. Last fiscal year output 3,698 tons.

Franklin No. 4 Mine Drift; Miller "B" Seam! 42 to 54 in. thick.
PO—Johnstown, Pa.; SP—Same; CTY—Cambria.
MS—Frank Boyd.......Johnstown, Pa.
S of H—1 elec. loco. Track gauge 45 in.
S of M—2 elec. mach.
PP—Receive power from Steel Works Central plant.
EMP—28. Last fiscal year output 9,020 tons.

Conemaugh Mine; Slope; Upper Freeport "E" Seam 36 to 42 in. thick.
PO—Johnstown, Pa.; SP—Same; CTY—Cambria.
MS John Broderick....Johnstown, Pa.
S of H—Mules and rope. Track gauge 42 in.
S of M—6 comp. air mach.
PP—3 B. & W. return tubular boilers, total 300 H. P., 3 pumps, and 1 air compressor.
EMP—95. Last fiscal year output 117,350 tons.

CANN COAL CO

Carver Mine, Shaft, Brookville, Bed A Seam, 4½ ft. thick.
PO—Stoneboro, Pa.; SP—Same, CTY—Mercer; RR—N. Y. C.
PR—Robt. P. Cann,...Stoneboro, Pa.
TR—John C. Cann " "
GM—Robt. P. Cann " "
PA—Robt. P. Cann " "
GS—Robt. P. Cann " "
EM—L. J. Cann " "
S of H—Mules, Rope and 1 elec. loco., Track gauge 36 inches.
S of M—Hand, and 1 elec. machine.
PP—3 Return tubular boilers, total 450 H. P., 4 gen. units 250 volts D. C., 3 pumps.
(Not in operation)

CANONSBURG GAS COAL CO.

General Office, Marine Bank Bldg., Pittsburgh, Pa.
Shaft Mine; Pgh. Seam, 66 in. thick.
PO—Canonsburg, Pa.; SP—Same; CTY—Washington; RR—P. C. C. & St. L.
PR—H. A. Davis,.....Pittsburgh, Pa.
TR—H. A. Davis, " "
GM—H. A. Davis, " "
PA—H. A. Davis, " "
CE—Randolph-Means Co., " "
EM—Chaney & Armstrong, Washington, Pa.
SCO—Canonsburg Merc. Co. Buyer, R. W. Davis, Canonsburg, Pa.
S of H—Mules.
S of M—3 elec. mach.
PP—Power purchased.
EMP—80. Last fiscal year output 10,500 tons.

CARBON COAL & COKE CO.

General Office, 85 Devonshire St., Boston, Mass.
Cambria No. 3, Carbon No. 4, and Ocean Nos. 2, 3, 4 and 5 Mines; Shaft and Drifts; Fulton, Kelly, and Barnett Seams, 46 to 72 in. thick.
PO—Langdondale & Dudley, Pa.; SP—Same; CTY—Huntingdon and Bedford; RR—H. & B. T.
PR—Arthur E. Doe....Providence, R. I.
TR—J. Milton Payne, Pawtucket, R. I.
PA—W. W. E. Shannon, Dudley, Pa.
MS—W. W. E. Shannon, " "
SCO—Broad Top Supply Co. Buyer, W. W. E. Shannon, Dudley, Pa.
S of H—Elec. and mules.
S of M—Hand.
PP—4 boilers, total 600 H. P., 1 pump.
EMP—415. Last fiscal year output 160,000 tons.

CARDIFF COAL CO

See Tunnel Coaling Co.

CARNEGIE COAL CO.

General Office, Park Bldg., Pittsburgh, Pa.
PR—John A. Bell, ...Pittsburgh, Pa
TR—J.T.M. Stoneroad, " "
GM—J. H. Sanford, " "
GS—Geo. F. Osler, " "
PA—R. B. Haverstick, " "
EM—J. W. Adams, ... Oakdale, "
SCO—Carnegie Supply Co., Pgh., "
Sales Agent, Milton Griest " "

Carnegie Mine, Drift, Pittsburgh Seam, 4½ to 6 ft. thick.
PO—Carnegie, Pa. SP—Same. CTY—Allegheny. RR—P. C. C. & St. L.
MS—Arch Robertson, .. Carnegie, Pa.
S of H—1 elec. loco. and mules. Track gauge 42 in.
S of M—2 elec. mach. and hand.
PP—3 Erie City boilers, total 300 H. P., 1 gen. unit, 500 volts D. C., 1 pump.
EMP—64. Last fiscal year output, 68,459 tons.

Oakdale Mine, Drift, Pittsburgh Seam, 5 to 6 ft. thick.
PO—Oakdale, Pa. SP—Same. CTY—Allegheny. RR—P.C.C.&St.L.
MS—Jos. Linden, ... Oakdale, Pa.
SM—S. M. Reed, " "
S of H—2 elec. locos. and mules. Track gauge 42 in.
S of M—14 elec. mach.
PP—2 Erie City Boilers, total 200 H. P., 1 gen. unit, 500 volts, D. C., 6 pumps.
EMP—380. Last fiscal year output 361,038 tons.

Primrose Mine, Drift, Pgh. Seam, 5 to 6 ft. thick.
PO—Primrose, Pa.; SP—Same; CTY—Washington; RR—P. C. C. & St. L.
MS—Joseph Linden......Primrose, Pa.
SM—J. A. Daudet, " "
S of H—4 elec. loco. and mules. Track gauge 42 in.
S of M—22 elec. mach.
PP—4 Erie City boilers, total 400 H.P. 1 gen. unit, 500 volts D. C., 8 pumps.
EMP—523. Last fiscal year output 382,706 tons.

CARNWATH COAL CO

General office, Winburne, Pa.
Carnwath Nos. 1 and 2 Mines; Drift "D" or L. Freeport Seam, 34 to 40 in. thick.
PO—Carnwath, Pa.; SP—Same; CTY—Clearfield; RR—N. Y. C., Potts Run Br.
PR—M.C. Buchanan, Chambersburg,Pa.
TR—Robt.H.Somerville, Winburne, Pa.
GM—Robt.H.Somerville, " "
CE—E. W. Hess......Clearfield, Pa.
EE—Fred Patterson..New Millport, Pa.
MS—James Gray........Carnwath, Pa.
PA—James Gray........Carnwath, Pa.
SCO—Carnwath Supply Co. Buyer J. M. Fleck, New Millport, Pa.
S of H—5 elec. loco. Track gauge 36 in.
S of M—3 Elec. mach. and hand.
PP—2 Return tubular boilers, total 250 H. P., 1 gen. unit 250 volts D: C. Purchase power No. 2 Mine.
EMP—223. Last fiscal year output 170,143 tons.
Sales Agencies—C. L. Amos Coal Co., Syracuse, N. Y., Glen Brook Coal Co., Philadelphia, Pa.
Note—Are now developing Mine No. 3.

CARROLLTOWN COAL CO.

Victor Nos. 1, 2, 3, 4, 6, 10, 12, 14, 15, and 17 mines; Drifts and Slopes; Lower Freeport Seam.
PO—St. Benedict, Pa. SP—Same. CTY—Cambria. RR—N. Y. C.
PR—Rembrandt Peale, St. Benedict, Pa.
VP—Richard Peale, " "
TR—N. B. Oakes, " "
PA—G. E. Metzger, St. Benedict, Pa.
GS—Alex Dunsmore, " "
EM—Merritt Hutton, " "
CE—Merritt Hutton, " "
MM—E. Kent Davis, " "
EE—E. Kent Davis, " "
SCO—Benedictine Stores Nos. 2 and 3, St. Benedict, Pa. Buyer, F. N. Artley.
S of H—9 elec. locos., mules and rope.
S of M—20 elec. and 18 comp. air machines and hand.
PP—12 return tubular boilers, total 1,730 H. P., 3 air compressors, 10 pumps.
EMP—515. Last fiscal year output 473,324 tons.

CASCADE COAL & COKE CO.

General Office, Buffalo, N. Y.
PR—Hugh Kennedy ....Buffalo, N.Y.

TR—H. M. Van Horn " "
PA—H. M. Van Horn " "
GM—Hugh Kennedy, " "
GS—C. C. Gadd......Sykesvlle, Pa.
CE—The W. G. Wilkins Co., Pittsburgh, Pa.

Sykesville Mine, Shaft, Lower Freeport Seam, 5 1-2 ft. thick.
PO—Sykesville, Pa., SP—Sykes, CTY—Jefferson.
RR—Buff. and Susq. and B. R. & P.
MS—C. C. Gadd....... Skyesville, Pa.
S of H—10 Elec. loco., track gauge 42 in.
S of M—28 Compressed air machines.
PP—6 B. & W. Water tube boilers, total H. P. 1812, 3 gen. units 2200 volts A. C. and 250 D. C. 3 Air compressors, [illegible] pumps.
EMP—462. Last fiscal year output 490,000 tons.
200 Bee Hive coke ovens.
200 Rectangular coke ovens.

Tyler Mine, Drift, Kittanning "B" seam, 44 in. thick, operate Washery.
PO—Tyler, Pa., Sp—Same, CTY—Clearfield.
RR—Buff. & Susq. and Penna. R. R.
MS—G. J. Baummer........Tyler, Pa.
S of H—13 Elec. loco., track guage 36 in.
S of M—Hand.
PP—6 B. & W. Water tube boilers, total 1208 H. P., 3 gen. units 250 volts D. C., and 2200 volts A. C.
EMP—659. Last fiscal year output 450,000 tons.
400 Bee Hive coke ovens.

CASEY COAL CO.

Shamrock Mine; Drift; Pgh. Seam, 60 to 66 in. thick.
PO—Carnegie, Pa.; SP—Leasdale, Pa.; CTY—Allegheny; RR—P. C. C. & St. L.
PR—D. C. Casey........Carnegie, Pa.
TR—D. C. Casey, " "
PA—D. C. Casey, " "
GM—D. J. McGarry, " "
S of H—Gravity; track gauge, 30 in. thick.
S of M—Hand.
EMP—9. Last fiscal year output, 8,200 tons.

CASSIDY COAL CO.

Drift Mine; Moshannon Seam; 42 in. thick.
PO—Curwensville, Pa.; SP—Hyde, Pa.; CTY—Clearfield; RR—B. R & P.
PR—M. A. Caldwell, Curwensville, Pa.
TR—M. A. Caldwell " "
PA—M. A. Caldwell, " "
GM—C. O. Norris, " "
MS—C. O. Norris, " "
CE—E. W. Hess,.......Clearfield, Pa.
EM—E. W. Hess " "
S of H—Mules.
S of M—Hand.
EMP—60. Last fiscal year output 48,384 tons.
Sales Agent, M. A. Caldwell, Curwensville, Pa.

CEDAR HILL COAL MINING CO.

General Office, Harrison Bldg., Philadelphia, Pa.
PR—John Casanave...Philadelphia, Pa.
TR—W. F. Eisenhower, " "
GM—F. D. Casanave, Jr., " "
VP—C. W. Bickford, Osceola Mills, Pa.
GS—Thomas Green, Osceola Mills, Pa.
PA—C. W. Bickford, " "
EM—H. Shillingford. " "

(Continued on Next Page.)

Cedar Hill Coal Mng. Co.—Cont.
Lenore Nos. 1 and 2 Mines; Drifts; "E" Seam, 30 to 34 in. thick.
PO—Brisbin, Pa.; SP—Same; CTY—Clearfield; RR—P. R. R.
MS—Chas. W. Isenberg....Brisbin, Pa.
S of H—Mules; track gauge, 30 in.
S of M—Hand.
EMP—38.

Mountain Branch Mine; Drift.
PO—Houtzdale, Pa.; SP—Same; CTY—Clearfield; RR—P. R. R.
MS—Chas. W. Isenberg....Brisbin, Pa.
S of H—Mules.
S of M—Hand.
Last fiscal year output, 50.000 tons.

Caswin Mine No. 1; Drift .
PO—Osceola Mills, Pa.; SP—Same; CTY—Clearfield; RR—P. R. R.
MS—Jonathan Taylor, Osceola Mills, Pa.
S of H—Mules.
S of M—Hand.
Last fiscal year output, 50,000 tons.

CENTRAL YOUGH COAL CO.
General Office, Farmers Bank Bldg., Pittsburgh, Pa.
Shaner Mine; Drift; Pittsburgh Seam, 73 in. thick.
PO—Shaner, Pa.; SP—Same; CTY—Westmorelaind; RR—B. & O.
PR—Walter R. Calverly, Pittsburgh, Pa.
GM—Walter R. Calverly, " "
GS—Walter R. Calverly, " "
PA—W. A. Luce, " "
TR—W. A. Luce, " "
EM—Geo. S. Baton & Co. " "
MS—J. W. A. Luce....Yohoghany, Pa.
S of H—1 elec. loco.
S of M—2 Elec. mach.
PP—Power purchased, 1 pump.
EMP—42. Last fiscal year output 43,961.78 tons.

CENTRE COAL & COKE CO.
General Office, Osceola Mills, Pa.
PR—C. H. Rowland, ..Phillipsburg, Pa.
GM—C. H. Rowland " "
TR—C. A. Rickenbaugh, Osceola Mills, Pa.
PA—C. A. Rickenbaugh, " "

Weston Mine, Drift, "B" Seam, 4 to 6 ft. thick.
PO—Osceola Mills, Pa.; SP—Same; CTY—Clearfield.
RR—P. R. R.
MS—J. R. O'Neill...Osceola Mills, Pa.
S of H—1 Elec. loco., track guage 36 in.
S of M—Hand.
PP—Power purchased, 2 pumps.
EMP—90. Last fiscal year output 73,445 tons.

Union No. 3 Mine, "A" Seam 4 ft. thick.
PO—Osceola Mills, Pa.; SP—Same; CTY—Clearfield.
RR—P. R. R.
MS—Eroc Cowfer....Osceola Mills, Pa.
S of H—Mules, track gauge 36 in.
S of M—Hand.
EMP—9. Last fiscal year output 3,555 tons.

CENTURY COKE CO.
General Office, Uniontown, Pa.
Century Mine, Drift.
PO—Brownsville, Pa.; SP—Simpson, Pa. RR—Monongahelia.
PR—C. E. Lenhart....Uniontown, Pa.
GM—C. E. Lenhart, " "
TR—G. S. Harah, " "
MS—D. C. Sheets.....Brownsville, Pa.
PA—D. C. Sheets, " "
CE—Fayette Engineering Co.
SCO—Century Supply Co., Buyer, L. A. Lenhart, Brownsville, Pa.
S of H—1 elec. loco. and mules. Track gauge 44 in.
S of M—Hand and 2 elec. mach.
PP—Boiler, 100 H. P., 4 pumps. Buy power.
EMP—180. Last fiscal year output 87,653 tons. Coke ovens 205.

CHAMBERS & UZZELL COAL CO.
No. 10 Mine; Drift; "B" Seam, 48 to 66 in. thick.
PO—Clarence, Pa.; SP—Snow Shoe, Pa.; CTY—Centre; RR—P. R. R., Sugar Camp Br.
PR—David Chambers......Clarence, Pa.
GM—David Chambers, " "
MS—David Chambers, " "
S of H—Mules.
S of M—Hand.
EMP—80. Last fiscal year output, 48,000 tons.
Successors to the Clarence Coal Co.

CHAMPION CONNELLSVILLE COKE CO.
General Office, Connellsville, Pa.
Champion Mine; Drift; Pittsburgh Seam; 92 to 108 ins. thick.
PO—Brownsville, Pa.; SP—Same; CTY—Fayette; RR—Monongahela.
PR—M. F. Pickard...Connellsville, Pa.
TR—John E. Hess .....Uniontown, Pa.
GM—John E. Hess " "
GS—A. B. Nedrow.....Brownsville, Pa.
PA—A. B. Nedrow " "
CE—M. F. Pickard...Connellsville, Pa.
ME—Fayette Eng. Co....Uniontown, Pa.
S of H—Mules.
S of M—Hand.
PP—2 pumps. Purchase power.
40 Bee Hive coke ovens.

CHAPMAN COAL COMPANY
Chapman No. 1 Mine; Drift; "D" Moshannon Seam; 44 in. thick.
PO—Barnesboro, Pa.; SP—Same; CTY—Cambria; RR—Penna. Walnut Run Branch.
PR—F. A. Kline.....Carrolltown, Pa.
GS—F. A. Kline " "
EM—F. A. Kline " "
TR—L. W. Maurer.......Patton, Pa.
PA—L. W. Maurer " "
S of H—Mules.
S of M—Hand.
EMP—20. Sales Mgr., L. W. Maurer, Patton, Pa.

CHARTIERS CREEK COAL COMPANY
General Office, Park Bldg., Pittsburgh, Pa.
Hazel Mine; Slope; Pittsburgh Seam; 54 to 72 in. thick.
PO—Canonsburg, Pa.; SP—Same; CTY—Washington; RR—P. C. C. and St. L.
PR—A. M Marion, Park Bldg., Pittsburgh, Pa.
TR—A. M. Marion, Park Bldg., Pittsburgh, Pa.
MS—Emil Gerry.......Canonsburg, Pa.
S of H—21 elec. locos.
S of M—26 elec. mach.
PP—15 water tube boilers, total 2250 H. P., 250 volts D. C., 10 pumps. Purchase power.
Note—Successors to Pittsburgh-Buffalo Co.

CHERRY TREE COAL CO.
General Office, St. Benedict, Pa.
Emeigh Nos. 1 and 3 Mines, Slopes and Drifts. Lower Freeport Seam.
PO—Emeigh, Pa. SP—Cherry Tree, Pa. CTY—Cambria. RR—N. Y. C.
PR—Rembrandt Peale, St. Benedict, Pa.
VP—Richard Peale, " "
TR—N. B. Oakes, " "
PA—G. E. Metzger, " "
EM—Merritt Hutton, " "
CE—Merritt Hutton, " "
MM—E. Kent Davis, " "
MS—A. M. Dunsmore. St. Benedict, Pa.
SCO—Central Trading Co. Buyer, E. T. Harvey, Philipsburg, Pa.
S of H—Rope and 1 elec. loco.
S of M—8 elec. and 23 comp. air machines.
PP—4 return tubular boilers, total 600 H. P., 2 air comp., 4 pumps.
EMP—274. Last fiscal year output 248,480 tons.

CHESTNUT RIDGE COAL CO.
Chestnut Ridge Mine. CTY—Clarion.
GS—M. A. Lehner....Rimersburg, Pa.
No report.

CHESTNUT RIDGE COAL MINING CO.
See W. L. Irish & Co.

CHESTON COAL CO.
Cheston Mines, Drift, C. Prime and D. Prime Seam, 36 to 48 in. thick.
PO—Hastings, Pa.; SP—Same; CTY—Cambria; RR—P. R. R., Hastings branch.
PR—Chas. E. Brown......Hastings, Pa.
GM—Chas. E. Brown, " "
GS—Chas. E. Brown " "
PA—Chas. E. Brown " "
MS—Wm. G. Tyler " "
EM—Chas. E. Schlicher, Spangler, Pa.
S of H—Gravity & Mules; Track Gauge 36 in.
S of M—Hand.
EMP—10. Last fiscal year output 4,921 tons.
Sales Agent, Jas. Pierpoint & Sons, Co., Philadelphia, Pa.

CHURCH HILL MINING CO.
Church Hill Mine; Drift; Kittanning Seam, 42 to 48 in. thick
PO—Leechburg, Pa.; SP—Monterey, Pa..
GM—L. W. Hicks......Leechburg, Pa.
PA—L. W. Hicks, " "
EM—E. A. Watters, " "
MS—A. J. Watson..West Monterey, Pa.
S of H—Elec. loco.
S of M—Elec.
EMP—125. Last fiscal year output 82,282 tons.

CITIZENS COAL CO.
Gauties, Green Hill and Dale Mines. Slope and Drift; "B" or Miller Seam; and "E" or Coke Yard Seam; 3 ft. 9 in. thick.
PO—Johnstown, Pa.; SP—Same; CTY—Cambria. RR—P. R. R., and B. & O.
PR—W. J. Kuntz......Johnstown, Pa.
TR—A. M. Custer, " "
GM—Geo. T. Robinson, " "
PA—J. K. Bole, " "
MS—J. E. Ashley, " "
SM—J. K. Bole, " "
EM—S. E. Dickey, " "
S of H—Mules and Elec., track gauge 3 ft.
EMP—200. Last fiscal year output 125,000 tons.
Sales Agent, Operators Coal Co

CLARE COKE CO.
General Office, Greensburg, Pa.
Clare Mines; 3 openings; Drift; Connellsville Seam, 96 in. thick.
PO—R. F. D. Mt. Pleasant, Pa.; SP—Trauger, Pa.; CTY—Westmoreland; RR—P. R. R., Mammoth branch.
PR—James A. Bennett..Greensburg, Pa.
TR—L. E. Walters, " "
GM—L. E. Walters, " "
PA—L. E. Walters, " "
MS—H. L. Hartzell, R. F. D., Mt. Pleasant, Pa.
CE—Harrop, Hopkins & Taylor, Pgh, Pa.
MM—George Miller.....Lycippus, Pa.
SCO—Welty Supply Co. Buyer, W. S. Miller, R. F. D. Mt. Pleasant, Pa.
S of H—2 steam loco. and rope. Track gauge 40 in.
S of M—Hand.
PP—3 Erie Return tubular boilers, total 240 H. P., 3 compressors and 2 pumps.
EMP—150. Last fiscal year output 91,000 tons. Coke ovens, 150 Bee Hive.
Sales Agency, Walter-Wallingford & Co., Cincinnati, O.

CLARION COAL MINING COMPANY.
General Office, 740 Land Title Bldg., Philadelphia, Pa.
Clarion No. 1, Drift; Lower Kittanning Seam; 3 to 4½ ft. thick.
PO—Huey, Pa.; SP—Same; CTY—Clarion. RR—P. R. R., Sligo Br.
PR—Henry M. Tracy..Philadelphia, Pa.
TR—Frank Yeakle......Norristown, Pa.
GM—H. B. Scott......Phillipsburg, Pa.
PA—H. B. Scott, " "
MS—Thomas J. Reese........Huey, Pa.
S of H—2 Elec. loco., track gauge 36 in.
S of M—4 Elec. and 7 comp. air mach.
PP—Boilers total 500 H. P., 150 K. W., 500 volts D. C., 7 compressors, 4 pumps.
EMP—100.
Sales Agent, Mark A. Thompson, Syracuse, N. Y.

CLARK BROS. COAL MINING CO.
General Office, Commonwealth Bldg., Philadelphia, Pa.
PR—J. O. Clark...Glen Campbell, Pa.
TR—S. L. Clark.........Phila., Pa.
PA—J. H. Miller..Glen Campbell, Pa.
CS—J. H. Miller, " " "
SM—W. S. Martz, " " "
Sales Agency, address the Phila. office.

Falcon Nos. 5½ and 7 Mines, Drift; "C" Seam; 5 ft. thick.
PO—Glen Campbell, Pa.; SP—Same; CTY—Indiana. RR—P. R. R., Cush Creek.
MS—John Stewart..Glen Campbell, Pa.
S of H—Mules, track gauge 3 ft.
EMP—20. Last fiscal year output 18.500 tons.

Falcon No. 3 Mine, Drift; "D" Seam, 2 ft. 4 in. thick.
PO—Beccaria, Pa.; SP—Same; CTY—Clearfield. RR — Penna., Moshannon & Maderia Branches.
MS—Thos. Stoker....Smoke Run, Pa.
S of H—Mules, track gauge 3 ft.
S of M—Hand.
EMP—30. Last fiscal year output 15,000 tons.

Falcon No. 4, Drift; "D" Seam; 2 ft. 10 in. thick.
PO—McCartney, Pa.; SP—Same; CTY—Clearfield. RR—P.R.R., Masbannon & Maderia Branches.
MS—Arthur Dufore,....McCartney, Pa.
S of H—Track gauge 3 ft.
S of M—Hand.
EMP—4. Last fiscal year output 1,000 tons.
Mines Nos. 1, 2, 5, 6 and 8 abandoned.

CLARK, H. E.
Indiana Nos. 3, 4, 5 and 8 Mines; Drifts; "E" Seam, 3½ to 4 ft. thick.
PO—Glen Campbell, Pa.; SP—Same; CTY—Indiana; RR—P. R. R., N. Y. C.
GM—H. E. Clark, 1536 Commercial Trust Bldg., Philadelphia, Pa.
SCO—Mammoth Supply Co., Buyer George Scott, Philipsburg, Pa.
S of H—1 Elec. loco. and mules.
S of M—2 Elec. mach. and hand.
PP—2 Keeler, return tubular boilers, total 225 H.P. gen. units 500 volts D. C., 1 pump.
EMP—55. Last fiscal year output 35,000 tons.

CLEAR CREEK COAL CO.
General Office, Altoona, Pa.
Clear Creek No. 1 Mine; Drift; Upper Freeport Seam; 30 to 32 in. thick.
PO—Flinton, Pa.; SP—Coalport, Pa.; CTY—Cambria; RR—P. R. R., Cresson and Coalport branch.
PR—M. R. Keesey, ...Altoona, Pa.
Secy—H. B. Tinges........Altoona, Pa.
TR—Harry Hahman, " "
PA—H. B. Tinges, " "
MS—F. W. Fuller........Flinton, Pa.
S of H—Mules.
EMP—45. Last fiscal year output 10,000 tons.

CLEARFIELD BITUMINOUS COAL CORP.
General Office, Clearfield, Pa.
GM—H. B. Douglas....Clearfield, Pa.
GS—H. J. Hinterteitner, .Clearfield, Pa.
PA—A. J. Musser, " "

Cooper Mine; Drift; "B" L. Kittanning Seam, 3 ft. thick.
PO—Grassflat, Pa.; SP— Peale, Pa.; CTY—Clearfield; RR— N.Y.C. & H.R., Grassflat Branch.
MS—Andrew Frendberg, .. Peale, Pa
S of H—3 elec. loco. and mules; track gauge 36 in.
S of M—3 elec. mach. and hand.
PP—2 Return tubular boilers, total 160 H. P., 250 volts D. C., Elec. current from Pleasant Hill mine.
EMP—205. Last fiscal year output 156,348 tons.
Pleasant Hill Mine; Drift; "B" L. Kittanning Seam; 34 in. thick.
PO—Grassflat, Pa.; SP— Peale, Pa.: CTY—Clearfield; RR— N.Y.C. & H.R., Grassflat Branch.
MS—Fred Bass.........Grassflat, Pa.
S of H—3 Elec. loco.; track gauge 36 in.
S of M—3 Elec. mach. and hand.
PP—5 Return tubular boilers, total 700 H. P., 3 gen. units 275 volts D. C., 5 pumps.
EMP—175. Last fiscal year output 151,308 tons.

Clearfield Bituminous Coal Corp.—Cont.
West Branch Mine; Drift; "D" L. Freeport Seam, 46 in. thick.
PO—Barnesboro, Pa.; SP—Same; CTY—Cambria; RR—N.Y.C.&H.R.
MS—Timothy McCarthy. Barnesboro, Pa.
S of H—5 elec. loco. Track gauge 36 in. in.
S of M—5 elec., 17 comp. air mach. and hand.
PP—7 Return tubular boilers, total 1000 H. P., 2 gen. units, 4100 volts, 3 air compressors and 3 pumps.
EMP—208. Last fiscal year output 168,620 tons.

Sample Run Mine, Slope; "D" L. Freeport Seam, 46 in. thick.
PO—Clymer, Pa.; SP—Same, CTY—Indiana; RR—N. Y. C. & H. R., Cherrytree & Dixonville Branch.
MS—H. H. Hetrick......Clymer, Pa.
S of H—3 Elec. loco. and rope; track gauge 36 in.
S of M—7 elec., 9 comp. air mach. and hand.
PP—3 Keeler Return tubular boilers, total 450 H. P., 1 gen. unit 250 volts D. C., 1 comp. and 3 pumps.
EMP—292. Last fiscal year output 257,813 tons.

Barr Mine; Slope; "D" L. Freeport Seam, 42 in. thick.
PO—Clymer, Pa.; SP—Same; CTY—Indiana; RR—N. Y. C. & H. R., Cherrytree & Dixonville Branch.
MS—James Laing ..... Clymer, Pa.
S of H—3 Elec. loco. and rope; track gauge 36 in.
S of M—7 elec., 10 comp. air mach. and hand.
PP—4 Keeler Return tubular boilers. total 600 H. P., 2 gen. units 250 volts D. C., 1 compressor and 2 pumps.
EMP—205. Last fiscal year output 184,569 tons.

Rossiter Nos. 1, 3 and 4 Mines; "E" Up. Freeport Seam, 4 ft. thick.
PO—Rossiter, Pa.; SP—Same; CTY—Indiana; RR—N. Y. C. & H. R., Rossiter Branch.
MS—Malcolm MacDougal, Rossiter, Pa.
S of H—25 elec. loco. Track gauge 36 in.
S of M—13 elec., 50 comp. air mach. and hand.
PP—3 Keeler Water tube boilers 1200 H. P., 2 turbine gen. units 1500 K. V. A., 2300 volts A. C., 1 compressor.
EMP—800. Last fiscal year output 661,153 tons.

CLEARFIELD COLLIERY CO.
General Office, Clearfield, Pa.
Caldwell Mine, Drift, "D" Seam 3 1-2 ft. thick.
PO—Curwensville, Pa.: SP—Rowles Sta.; CTY—Clearfield; RR—N. Y. C. & H. R.
PR—J. M. Flosch.....Rochester, N. Y.
GM—A. W. Bigler....Clearfield, Pa.
GS—A. W. Bigler, " "
PA—A. W. Bigler, " "
MS—W. H. Hephart. Curwensville, Pa.
S of H—1 Elec. loco.; track gauge 36 in.
S of M—Hand and 2 Elec. machines.
PP—Buy power.
EMP—80.
Sales Agents, B. Nicoll Co., N.Y.

CLEARFIELD & CAMBRIA COAL & COKE CO.
General Office, Port Deposit, Md.
See Hollow Mines, Drift.
PO—La Jose, Pa. SP—Same. CITY—Clearfield. RR—P. R. R.
PR—Peter E. Tone, Baltimore, Md.
TR—W. W. Hopkins, Port Deposit, Md.
S of H—Electric Locomotives.
S of M—Electric Machines and hand.

CLERMONT SEWER PIPE CO.
Lyman Nos. 1 and 2, Shaft; Seam 3 ft. thick.
PO—Clermont Pa. SP—Same. CTY—McKean.
PR—M. F. Quinn, ... Clermont, Pa.
TR—W. E. Ringrose, " "
GM—W. E. Ringrose, " "
PA—W. E. Ringrose, " "
MS—W. M. Dunsmore, " "
S of H—Mules. Track gauge 3 ft.
S of M—1 Compressed Air Machine.
PP—3 boilers, total 300 H. P. 1 compressor, 1 pump.
EMP—25.

CLIMAX COAL CO.
PR—Chas. W. Mills...Philadelphia, Pa.
GM—Chas. W. Mills, " "
PA—Chas. W. Mills, " "
TR—Eugene Walling, " "
GS—Hans Holl....Lockport Station, Pa.
EM—Hans Holt, " "
EE—Geo. Mulligan, " "
SM—Chas. W. Mills.
SCO—Climax Coal Co. Store.

Climax No. 1 Mine; Drift; E Seam, 48 to 84 in. thick.
PO—Lockport Station, Pa.; SP—Same; CTY—Westmoreland; RR—Penna., Conemaugh Div.
S of H—Mules.
S of M—Hand.
EMP—20. Last fiscal year output 25,000 tons.

Climax No. 2 Mine; Drift; E Seam; 48 to 84 in. thick.
PO—Lockport Station, Pa.; SP—Same; CTY—Westmoreland; RR—Penna.; Conemaugh Div.
S of H—1 elec. and 1 gasoline loco. Track gauge 42 in.
S of M—1 elec. mach.
PP—1 return tubular boiler, total 120 H. P., 1 gen. unit, 250 volts D. C.
EMP—80. Last fiscal year output 75,000 tons.

Climax No. 3 Mine; Drfit; D Seam; 38 in. thick.
PO—Lockport, Pa.; SP—Same; CTY—Westmoreland. V!6 E Westmoreland; RR—Penna.; Conemaugh Div.
S of H—1 elec. loco.
S of M—1 elec. mach.
Note—New mine.

CLYDE COAL CO.
Gen. Office, 1120 Bessemer Building, Pittsburgh, Pa.
Clyde Mine, Drift, Pittsburgh River Seam 72 to 96 in. thick.
PO—Fredericktown, Pa.; SP—Same, CTY—Washington; RR— P.R.R., Monongahela Div. and P. M. & S.
PR—James Neale......Pittsburgh, Pa.
TR—James Stuart Brown, " "
GM—Jas. G. Geegan, " "
PA—Jas. G. Geegan, " "
CE—Geo. S. Baton.....Pittsburgh, Pa.
EM—Geo. S. Baton, " "
MS—Jno. Shaw ...Fredericktown, Pa.
MM—Wm. Toward, " "
SCO—Clyde Supply Co., Buyer, I. A. Griffith, Fredericktown, Pa.
S of H—Horses and 8 elec. loco.
PP—6 pumps. Purchase power.
S of M—10 Elec. mining machines.
PP—6 pumps. Purchase power.
EMP—275. Last fiscal year output 259.706 tons. 2 Bee Hive coke ovens.

CLYMER BRICK & FIRE CLAY CO.
Clymer No. 1 Mine; Seam, 42 in. thick.
PO—Clymer, Pa.; SP—Same; CTY—Indiana; RR—P. R. R., N. Y. C. & H.
PR—John S. Fisher......Indiana, Pa.
TR—R. A. Henderson,.....Clymer, Pa.
GM—G. W. Lenkerd, " "
S of H—Mules.
S of M—Hand.
EMP—25. Last fiscal year output, 12,000 tons.
Mine coal for their own use.

COAL RUN MINING COMPANY
General Office, Punxsutawney, Pa.
Coal Run No. 1, 2 & 3 Mine; Drift; Upper and lower Freeport Seams. Upper, 48 in. thick. Lower, 50 to 68 in. thick.
PO—McIntyre, Pa.; SP—McIntyre Mines, Pa.; CTY—Indiana; RR—B. R. & P., Jacksonville Branch.
PR—L. W. Robinson...Punxsutawney, Pa.
TR—F. H. Beck " "
GM—L. W. Robinson, Jr...Indiana, Pa.
PA—H. C. Smith.....Punxsutawney, Pa.
EM—G. W. Brymer........Indiana, Pa.
EE—I. W. Householder, Punxsutawney, Pa
MS—W. C. Lowther......McIntyre, Pa.
S of H—5 elec. locos.
S of M—6 elec. mach.
PP—5 pumps. Purchase power.
Last fiscal year output, 137,824 tons.
Sales Mgr., G. L. Eaton, Rochester, N. Y.

COCHRAN BROS.
Spring Grove Mine, Drift, Connellsville Seam, 9 ft. thick.
PO—Dawson, Pa.; SP—Same; CTY—Fayette; RR—B. & O., Heckman Run Branch.
GM—R. D. Henry........Dawson, Pa.
MS—William Haas, " "
CE—Thos. Zimmerman, " "
S of H—Mules; track gauge 42 in.
S of M—Hand.
EMP—25. Coke ovens, 61 Bee Hive.
Sales Agent, W. N. Stone, 1104 House Bldg., Pittsburgh, Pa.

COCHRAN COAL CO.
Cochran Mine No. 1, Drift. Upper Freeport Seam, 45 to 52 in. thick.
PO—Salina, Pa. SP—Same. CTY —Westmoreland RR—P. R. R., Conemaugh Div.
PR—G. D. Tinsman....Williamsport, Pa.
TR—R. T. S. Steele, Williamsport, "
GM—W. H. Miller.........Salina, Pa.
PA—W. H. Miller .... Salina, Pa.
MS—W. H. Miller, " "
CE—W. H. Miller, " "
EM—A. Rorabaugh, " "
EE—James Woodmensee, " "
MM—S. S. Brown, " "
SCO—Bitumen Supply Co. Buyer J. E. Fillinger, Saline, Pa.
S of H—4 Elec. Loco. Track gauge 42 in.
S of M—11 Elec. machines.
PP—2 Erie City Return tubular boilers, total 300 H. P. 1 Gen. Unit, 275 volts A. C. 1 phase 60 cycle, 4 pumps.
EMP—197. Last fiscal year output 144,825 tons.

COLONIAL IRON CO.
Judith Mine, Slope, Kelly Seam, 3 ft. 10 in. to 4 ft. thick.
PO—Riddlesburg, Pa.; SP—Same; CTY—Bedford; RR—H. & B.T.
PR—C. M. Smith.....New York, N.Y.
TR—C. M. Smith, " " "
VP—Wm. Lauder .....Riddlesburg. Pa.
GS—E. P. Ross........Riddlesburg, Pa.
MS—J. C. Allen, " "
S of H—Rope. 1 steam loco., track gauge 38 in.
S of M—Hand.
PP—3 return tubular boilers, 2 air compressor and 5 pumps, 198 Bee Hive coke ovens.

COMMERCIAL COAL MINING CO.
General Office, Commercial Trust Bldg., Philadelphia, Pa.
Commercial Nos. 3, 4 and 5 Mines; Slope and drift; "B" Seam, 41-49 in. thick.
PO—Expedit, Pa. SP—Twin Rocks, Pa. CTY—Cambria. RR—P. R. R., Ebensburg & Blacklick Branch.
PR—Charles V. Bergh, Philadelphia, Pa.
TR—A. G. Lanners, " "
GS—W. C. Smith, ... Expedit, Pa.
EM—R. W. Weary, " "
EE—J. C. Dingwall, " "
SCO—Big Bend Supply Co. Buyer, W C. Shiffer, Expedit, Pa.
S of H—7 Elec. loco and rope. Track gauge 36 in.
S of M—Hand and elec. machines.
PP—Power purchased.
EMP—553.. Last fiscal year output, 412,050 tons.

CONAWAY, T. C. COAL COMPANY.
Out of business. See McClane Mining Co.

CONEMAUGH COAL CO.
General Office, Blairsville, Pa.
Conemaugh Mine; Drift; Pgh. Seam, 5½ ft. to 7½ ft. thick.
PR—T. L. Eyre....West Chester, Pa.
TR—Wilbur P. Graff....Blairsville, Pa.
GM—Frank M. Graff, " "
PA—Frank M. Graff, " "
MS—Ernest Fletcher....Saltsburg, Pa
CE—Albert Smith, " "
MM—Chancy Shipley, " "
SCO—Kiskimenitas Supply Co. (Saltsburg Store), Buyer, Wm. G. Fletcher, Blairsville, Pa.
SM—John A. Fletcher....Saltsburg, Pa
S of H—1 Elec. loco and mules, track gauge 42 in.
S of M—Hand.
PP—2 Return tubular boilers total 230 H.P. 1 100 K. W. gen. unit 250 volts D. C. 3 pumps.
EMP—156. Last fiscal year output 117,520 tons.
Sales Agent, Knickerbocker Fuel Co., New York, N. Y.

CONEMAUGH COAL MINING COMPANY
General Office, Johnstown, Pa.
Park Hill Mine; Slope & Drift; B. & C. Prime Seam; 46 to 54 in. thick.
PO—Johnstown, Pa.; SP—Conemaugh, Pa.; CTY—Cambria; RR—P. R. R.
PR—J. H. Saulsbury ...Johnstown, Pa.
TR—J. H. Saulsbury " "
PA—J. H. Saulsberry, " "
GM—H. C. Cook " "
GS—Jno. Harrington, ..Conemaugh, Pa.
S of H—Mules and rope.
S of M—Hand.
PP—Purchase power.
EMP—60. Last fiscal year output 21,000 tons.

CONEMAUGH SMOKELESS COAL CO.
General Office, Swank Bldg., Johnstown, Pa.
Robindale Mine, Shaft and Slope, "B" Seam, 44 to 50 ins. thick.
PO—Seward, Pa.; SP—Same; CTY—Indiana; RR—Penna.; Lang Hollow Extension.
PR—Geo. T. Robinson, Johnstown, Pa.
GM—Geo. T. Robinson, " "
TR—Wm. J. Kuntz, " "
GS—Geo. Haddell, ...Seward, Pa.
CE—S. M. Marshall.
S of H—1 elec. loco.
S of M—2 elec. mach.
PP— 2 pumps.
Output 3,002 tons.

CONESTOGA COAL COMPANY
General Office, Clearfield, Pa.
Conestoga Mine Drift; "B" Seam; 48 in. thick.
PO—Rosebud, Pa.; SP—Irvona, Pa.; CTY—Clearfield; RR—Penna., P. & N. W. Branch.
PR—H. M. Irvin.....Curwensville, Pa.
TR—W. I. Betts,.......Clearfield, Pa.
GM—W. I. Betts, " "
PA—W. I. Betts, " "
MS—William Heil,.......Rosebud, Pa.
S of H—Mules.
S of M—Hand.
Note—Successors to William Heil.

CONNELLSVILLE CENTRAL COKE CO.
General Office, Pittsburgh, Pa.
PR—Herbert DuPuy.....Pittsburgh, Pa.
TR—John C. Neff, " "
GM—John C. Neff, " "
GS—C. E. Bortz.......Uniontown, Pa.
SCO—Klondike Supply Co., Pgh., Pa.

Herbert Mine, Shaft, Pgh. Seam, 9 ft. thick.
PO—R. D. No. 4, Uniontown, Pa.; SP—Low Phow, Pa.; CTY—Fayette; RR—Monongahela.
S of H—Rope; track gauge 44 in.
S of M—10 Comp. air mach. and hand.
PP—8 Return tubular boilers, total 1,200 H.P., 2 gen. units, 250 volts D.C., 2 air compressors and 1 pump.
EMP—300. Last fiscal year output 160,000 tons. Coke ovens 210 rectangular.

Low Phos Mine, Slope, Pgh. Seam, [illegible] ft. thick.
PO—Uniontown, Pa., R. D. No. 4; SP—Low Phos, Pa.; CTY—Fayette; RR—Monongahela.
S of H—Rope.
S of M—Hand.
PP—4 Return tubular boilers, total 600 H.P., 1 gen. unit, 250 volts D.C., 1 air compressor, 1 pump.
EMP—185. Last fiscal year output 120,000 tons. Coke ovens, 250 Bee Hive.

CONNELLSVILLE COAL & COKE CO.
General Office, Connellsville, Pa.
Stoner Mine, Drift, Pgh. Seam, 8-9 ft. thick.
PO—Connellsville, Pa.; SP—Alverton, Pa.; CTY—Westmoreland; RR— P. R.R.
PR—W. D. McGinnis..Connellsville, Pa.
PA—W. D. McGinnis, " "
TR—A. C .Stickel, " "
S of H—Mules; track gauge 42 in.
S of M—Hand.
EMP—12. Last fiscal year output 16,562 tons.

CONNELLSVILLE COKE CO.
General Office, Connellsville, Pa.
Dexter Mine, Drift, Pittsburgh Seam 8 to 9 ft. thick.
PO—Scottdale, Pa. SP—West Overton, Pa.; CTY—Fayette. RR—B. & O
PR—J. Fred Kurtz..Connellsville, Pa.
GM—J. Fred Kurtz, " "
PA—J. Fred Kurtz,
TR—W. D. McGinnis, " "
MS—James J. Brown, "
EM—S. M. Foust, " "
S of H—Mules; track gauge 39½ in.
S of M—Hand.
PP—Purchase power.
EMP—40. Coke ovens, 40 Bee Hive. Last fiscal year output 24,553 tons. Sales Agent, Connellsville Coke Co

CONNELLSVILLE COKE & FUEL CO.
General Office, Connellsville, Pa.
Hazelburg Mine; Drift; Pittsburgh Seam; 84 to 96 in. thick.
PO—Ligonier, Pa.; SP—Same; CTY—Westmoreland, RR—P. R. R., L. V.
PR—R. Marietta......Connellsville, Pa.
GM—R. Marietta, " "
TR—W. H. Soisson, " "
PA—W. H. Soisson, " "
CE—S. M. Foust, " "
EM—Thos. Newton.......Ligonier, Pa.
GS—S. R. Kelly, " "
S of H—Mules, 1 comp. air and steam loco.
S of M—Hand.
PP—1 Erie return tubular boiler, total 125 H. P., 1 compressor, Coke ovens 80 Bee Hive.
EMP—70.

CONNELLSVILLE MUTUAL COKE CO
General Office, Scottdale, Pa.
Love Mine; Drift; Connellsville Seam, 72 to 120 in. thick.
PO—Scottdale, Pa.; SP—Mutual, Pa.; CTY—Westmoreland; RR—P. R. R.
PR—R. B. Hays......Masontown, Pa.
TR—John R. Byrne....Scottdale, Pa.
GM—John R. Byrne, " "
PA—John R. Byrne, " "
MS—John R. Bryne, " "
CE—E. C. McCullough..Uniontown, Pa.
S of H—Horses.
S of M—Hand.
Coke ovens, 32 Bee Hive.
EMP—35. Output for 3 months, 10.-000 tons.

CONQUEST COAL MINING COMPANY.
Conquest No. 1 Mine; Drift; Moshannon or "D Seam; 30 to 52 in. thick.
PO—Phillipsburg, Pa. SP—Same; CTY—Center; RR—Penna. Graham No. 2 Branch.
PR—N. H. Mull, .. Philipsburg, Pa.
TR—R. H. Mull, " "
GM—R. H. Mull, " "
PA—R. H. Mull, " "
GS—R. H. Mull, " "
MS—R. H. Mull, " "
EM—H. McD. Loraine, " "
S of H—Mules.
S of M—Hand
EMP—51. Last fiscal year output, 45,829 tons.

CONSOLIDATED COKE CO.
General Office, Uniontown, Pa.
PR—George Whyel .....Uniontown, Pa.
TR—W. L. Graham.....Masontown, Pa.
Sec—F. E. Weddell, " "
GM—George Whyel, " "
PA—J. D. Armstrong, " "
Consulting Chemist—Alexander Fleming, Uniontown, Pa.
SCO—Southern Supply Co., Buyer,. J. H. Yoder, Uniontown, Pa.

Donald Nos. 1 and 2 Mines, Drifts, Pgh. Seam, 7 to 9 ft. thick.
PO—Grays Landing, Pa.; SP—Same; CTY—Fayette; RR—M.R.R.
MS—A. J. Foy......Grays Landing, Pa.
SM—M. S. Simpson, " " "
S of H—Mules and 3 elec. loco.; track gauge 42 in.
S of M—Hand and 2 elec. machines.
PP—7 Erie and Phoenix Water Tube Boilers, total 1,050 H.P., 2 gen. units, 250 volts D.C.
EMP—400. Last fiscal year output 277,000 tons. 402 Bee Hive coke ovens.

Donald No. 3, Slope, Pittsburgh Seam, 7 to 9 ft. thick.
PO—Grays Landing, Pa.; SP—Same, CTY—Fayette; RR—M.R.R.
MS—A. J. Foy......Gray sLanding, Pa
SM—M. S. Simpson, " " "
S of H—1 Elec. motor, mules and rope; track gauge 44 in.
S of M—Hand and 5 comp. air machs.
PP—4 Erie Water Tube Boilers, total 600 H.P.
EMP—300. Last fiscal year output 110,000 tons. 160 Bee Hive coke ovens.

Sterling, Shaft, Pgh. Seam, 7 to 9 ft. thick.
PO—Mount Sterling, Pa.; SP—Masontown Station, Pa.; CTY—Fayette; RR—M.R.R.
MS—A. J. Foy......Grays Landing, Pa.
S of H—Mules and 3 elec. loco.; track gauge 44 in.
S of M—Hand and 12 comp. air machines.
PP—8 Phoenix Water Tube Boilers, total 1,600 H.P., 3 gen. units. 250 volts D. C., 3 air compressors, 2 pumps.
EMP—400. Last fiscal year output 216,000 tons. 310 Bee Hive coke ovens.

CONSOLIDATION COAL CO., THE

General Office, Continental Building, Baltimore, Md.
101 Mines in Md., West Va., Pa., and Ky.
Chairman of Board, C. W. Watson, Baltimore, Md.
PR—J. H. Wheelwright, " "
Secy—T. K. Stuart, " "
Mgr. of Trans—W. L. Andrews, " "
Genl. Auditor—A. S. Dunham, " "
VP—F. S. Landstreet, Bankers Trust Bldg., New York, N. Y.
VP—Geo. T. Watson..Fairmont, W. Va.
TR—S. L. Watson, " "
GM—F. R. Lyon, " "
Asst. GM—Brooks Fleming, Jr. Fairmont, W. Va.
PA—A. T. Watson, " "
PA—Asst., F. C. Davis, " "
CE—Frank Haas, " "
CE—Asst., J. C. Gaskill, " "
Chief Engineer, All Divisions—John G. Smyth ....Fairmont, W. Va.
Supt. P. & M. Dept.—R. L. Kingsland, Fairmont, W. Va.
Eng. of Tests—R. E. Rightmire, Fairmont, W. Va.
Live Stock Buyer—Frank Amos, Fairmont, W. Va
Genl. Mgr. of Sales—F. W. Wilshire, Bankers Trust Bldg., New York, N.Y.
Western Mgr. of Sales—E. M. Mancourt, Fisher Bldg., Chicago, Ill.

PENNSYLVANIA DIVISION.

GS—Samuel Steinbach....Somerset, Pa.
EM—Alfred Pearson, " "
EE—A. F. Finneran .... Jenner, Pa.
SCO—The Dull Mercantile Co., Somerset, Pa.; General Store Manager, R. F. Mason, Meyersdale, Pa.; Buyer, A. T. Watson, Fairmont, W. Va.

Consolidation Nos. 118, 119 Mines; Drift and Slope; C. Prime and E Seams, 3½ to 5 ft. thick.
PO—Jenners, Pa.; SP—Same; CTY—Somerset; RR—B. & O., Boswell Branch.
MS—A. W. Lowther.......Jenner, Pa.
SM—C. A. Bevans, " "
S of H—17 Elec. loco., and rope; track gauge, 42 in.
S of M—32 Elec. mach. and hand.
PP—6 B. & W., 1 Carlins, 1 Erie, return tubular boilers, total 2480 H. P. 7 gen. units, 2300 volts A.C. 3 phase, 60 cycles, 5 air comp., 5 pumps.
EMP—562. Last fiscal year output 657,365 tons.

Consolidation 101, 102, 104, 105, 106 Mines, Drifts; Pgh. and Redstone Seams; 4 to 10 ft. thick.
PO—Meyersdale, Pa.; SP— Consol 104, PA.; CTY—Somerset. RR—B. & O. Salisbury Branch.
MS—Hilton Thornley...Meyersdale, Pa.
SM—R. F. Mason, " "
S of H—Mules and 6 elec. loco. Track gauge 42 in.
S of M—Hand.

PP—4 Return tubular boilers, 2 Erie, 1 Atlas, and 1 Union, total 400 H. P., 4 gen. units, 500 volts, D. C.; 8 pumps.
EMP—357. Last fiscal year output 302,841 tons. Coke ovens, 225 Bee Hive.

Consolidation 108—114 Mines, Drift; "A" Seam; 3 to 9 ft. thick.
PO—Rockwood, Pa.; SP—Some; CTY—Somerset. RR—B. & O., Wilson Creek.
MS—J. J. Golby, R. D. 1, Rockwood, Pa.
SM—F. L. Hood, R. D. 1, Rockwood, Pa.
S of H—Mules and 2 elec. loco. Track gauge 42 in.
S of M—1 elec. mach.
PP—2 return tubular boilers, total 300 H. P., 2 gen. units, 250 volts D. C., 2 pumps.
EMP—108. Last fiscal year output 93,224 tons.

Consolidation Mine No. 111; Slope; C Prime Seam; 42 to 48 in. thick.
PO—R. D. 1, Garrett, Pa.; SP—Althouse, Pa.; CTY—Somerset; RR—B. & O. Berlin Br.
S of H—Rope and 1 elec. loco. Track gauge 36 in.
PP—2 return tubular boilers, total 300 H. P., 1 gen. unit, 250 volts D. C., 1 pump.
EMP—86. Last fiscal year output 78,540 tons.

Consolidation No. 117 Mine; Slope "C" Prime; 3 to 4½ ft. thick.
PO—Rlaphton, Pa. SP—Stoughton, Pa. CTY—Somerset. RR—B. & O. Boswell Div.
MS—A. W. Lowther........Jenner, Pa.
SM—Mahlon Warnick, Ralphton, Pa.
S of H—1 Elec. loco. and rope. Track gauge 42 in.
S of M—Hand.

PP—3 Erie City return tubular boilers, total 380 H. P. 1 gen. unit, 250 volts D. C., 1 pump.
EMP—26. Last fiscal year output 49,636 tons.
Consolidation Nos. 112, 113 Mines; Pine Hill Nos. 1 and 2 Seam 3 to 5 ft. thick.
PO—Pine Hill, Pa. SP—Consolidotion Nos. 112, 113, Pa. CITY—Somerset. RR—B. & O., Berlin Branch.
MS—Harry Phillips......Pine Hill, Pa.
SM—J. G. Smith, " " "
S of H—5 elec. locos. and mules. Track gauge 42 in.
S of M—2 Elec. mach. and hand
PP—1 Jeffrey, 1 Amos, 1 Erie return tubular boilers, total 425 H. P. 1 Gen. unit, 5 pumps.
EMP—213. Last fiscal year output 204,242 tons.

Consolidation No. 120 Mine, Drift, C. Prime Seam, 3½ to 4 ft. thick.
PO—Acosta, Pa. SP—Same. CTY — Somerset. RR—B. & O., Boswell Div.
MS—John Byron, ... Acosta, Po.
SM—Theodore Reese. " "
S of H—11 elec. locos. Track gauge 42 in.
S of M—24 Elec. mach. and hand.
PP—2 Return tubular boilers, total 150 H. P., 1 air compressor, 1 pump. Power combined from 118, 119, 120 mines.
EMP—323. Last fiscal year output 441,543 tons.

Consolidation Nos. 123 and 124 Mines; Shaft; "E" Seam, 42 to 54 in. thick.
PO—R. F. D. No. 2, Boswell, Pa.; SP—Gray, Pa.; CTY—Somerset; RR—Somerset Coal Rly.
SM—Jas. Nixon, R. D. 2, Boswell, Pa.
S of H—3 elec. loco. Track gauge 42 in.
S of M—5 elec. mach.
PP—Central power plant; 1 pumps.
EMP—166. Last fiscal year output 41,392 tons.

Consolidation No. 115 Mine, Drift, "C" Prime Seam, 4 to 6 ft. thick.
PO—Listie, Pa. SP—Same. CTY — Somerset. RR—B. & O., S. & C. Branch.
MS—J. J. Golby, R. D. 1, Rockwood, Pa.
S of H—Mules. Track gauge 42 in.
S of M—Hand.
PP—2 Erie City return tubular boilers, total 200 H. P.
EMP—41. Last fiscal year output 54,703 tons.

CORBETT COAL CO.

Seam 44 to 60 in. thick
PO—Timblin, Pa.; SP—Same; CTY—Jefferson; RR—P. S. & N.
PR—E. A. Corbett, ...Timblin, Pa.
TR—Jas. H. Corbett, Jr., " "
PA—Jas. H. Corbett, Jr., " "
GS—Samuel Walwork, " "
S of H—Elec. loco.
S of M—Elec. Mach.

CO-OPERATIVE COAL CO.

Underwood Mine—Drift, L. Kittanning Seam, 30 to 40 in. thick.
PO—Strattonville, Pa., R. D. 1; SP—Watterson, Pa.; CTY—Clarion; RR—L. E. F. & C.
PR—G. B. White.....Strattonville, Pa.
TR—W. F. Davis......Strattonville, Pa.
GM—R. C. Sell, R. D. 1, Baxter, Pa.
PA—R. C. Sell, " " "
MS—R. C. Sell, " " "
S of H—Mules.
S of M—Hand.
EMP—13. Last fiscal year output 9,112.75 tons.

CORNELL COAL CO.

General Office, Freeport, Pa.
Glassmere Colliery, Slope, Freeport Seam, 65 to 84 in. thick.
PO—Hite, Pa.; SP—Glassmere, Pa.; CTY—Allegheny; RR—P. R. R., Conemaugh Div.
PR—W. A. Iseman..........Hite, Pa.
GM—W. A. Iseman..........Hite, Pa.
GS—W. A. Iseman, " "
PA—W. A. Iseman, " "
TR—T. G. Cornell.......Freeport, Pa.
MS—W. E. Iseman.........." "
EM—D. E. Taylor........Freeport, Pa.
EE—C. A. Fisher, New Kensington, Pa.
MM—I. V. Woir............Arnold, Pa.
S of H—Rope, mules, 3 Elec. loco.; track gauge 44 in.
S of M—5 elec. mach.
PP—4 Water tube boilers, total 600 H. P., 4 pumps, also purchase power.
EMP—302. Last fiscal year output 374,263 tons.

CORNING BLOSSBURG COAL CORP.

General Office, Corning, N. Y.
Coal Run Mine; Drift; Bloss and Bear Creek Seams, 20 to 32 in. thick.
PO—Blossburg, Pa.; SP—Same; CTY—Tioga; RR—Erie & N. Y. C. & H. R.
PR—J. D. Carlton......Corning, N. Y.
TR—Guy W. Cheney, " "
MS—Chas. Schultz......Blossburg, Pa.
S of H—Mules.
S of M—Hand.
EMP—12-15. Last fiscal year output, 3,600 tons.
Successors to the Blossburg & Coal Run Coal Co.

CORONA COAL & COKE CO.

Bucher, Corona, Davis and Shoff Mines; Drifts, "B" Seam, 5 to 3½ ft. thick.
PO—Madera, Pa.; SP—Same; CTY—Clearfield; RR—P.R.R., N.Y.C. & H. R., Tyrone Div.
PR—T. S. Shoemaker..Philadelphia, Pa.
TR—H. B. Swoope......Madera, Pa.
GM—H. B. Swoope, " "
PA—H. B. Swoope, " "
GS—John Stevenson, " "
EM—S. R. Moore, " "
SCO—Madera Trading Co., Buyer, G. B. Curry, Madera, Pa.
S of H—Mules; track gauge 36 in.
S of M—Hand, 3 elec. and 15 comp. air mach.
PP—2 Water tube boilers, total 200 H. P., compressors and 5 pumps.
EMP—240. Last fiscal year output 252,109 tons.

CORTEZ COAL CO.

General Office, Punxsutawney, Pa.
Cortez No. 1 and 2 Mine, Drifts, Lower and Upper Freeport Seams; 36 to 84 in. thick.
PO—Anita, Pa.; SP—Same; CTY—Jefferson; RR—P.R.R., P. & N. W. Branch.
GM—R. Hampson ..Punxsutawney, Pa.,
MS—John R. Hampson......Anita, Pa.
S of H—Mules, track gauge 42 in.
S of M—Hand.
EMP—38. Last fiscal year output 18,315 tons.

COWANSHANNOCK COAL & COKE CO.

General Office, Punxsutawney, Pa.
Yatesboro Mine, Slope, Upper Freeport Seam, 4 ft. thick.
PO—Yatesboro, Pa.; SP—Same; CTY—Armstrong; RR—Rural Valley.
PR—L. W. Robinson, Punxsutawney, Pa.
GM—L. W. Robinson, " "
PA—L. W. Robinson, " "
CE—L. W. Householder, " "
TR—Wm. G. Miller.....Yatesboro, Pa.
GS—James Craig, " "
MM—J. E. Dickey, " "
EE—B. J. Clark, " "
SCO—Valley Supply Co., Buyer, Wm. G. Miller, Yatesboro, Pa.
S of H—31 elec. loco. and rope.
S of M—33 elec. mach.
PP—Sterling Water Tube Boiler, 6,000 volts A.C., 60 cycles.
EMP—1300. Last fiscal year output 1,198,477 tons.

CRAIG-GOULD COAL CO.

Sarah Mine; Slope; "B" Seam, 54 in. thick.
PO—Brisbin, Pa.; SP—Same; CTY—Clearfield; RR—P. & S.
PR—W. A. Gould........Brisbin, Pa.
TR—Frank Craig, " "
GM—Michael Craig, " "
EM—Michael Craig, " "
MS—Michael Craig, " "
PA—Thomas .V Gould, " "
MM—Fred Merritt, " "
EE—Fred Merritt " "
SCO—W. A. Gould & Bro., " "

S of H—Mules and rope; track gauge, 36 in.
S of M—Hand.
PP—Power purchased.
EMP—50.
Sales Agency, W. A. Gould & Bro., Brisbin, Pa.
New operation.

CRAMER COAL, COKE & STONE CO.

See Diamond Smokeless Coal Co.

CRESCENT COAL CO.

General Office, 2nd Nat. Bank Bldg., Pittsburgh, Pa.
PR—S. A. Taylor......Pittsburgh, Pa.
TR—J. W. Ailes, " "
PA—J. W. Ailes, " "
GS—Jos. Arkwright ....Epton, Pa.
EM—Harrop, Hopkins & Taylor, Pgh., Pa.
MM—John Schneinsberg, ..Rodfield, Pa.
EE—Jos. Whiteman ....Epton, Pa.
Sales Agent, Valley Camp Coal Co., Cleveland, O.

Peters Creek No. 2, Drift, Pittsburgh Seam, 5 to 6 ft. thick.
PO—Epton, Pa.; SP—Wilson, Pa.; CTY—Allegheny; RR—P.R.R., Mon Div.
S of H—Mules and 5 elec. loco.; track gauge 43½ in.
S of M—Hand and 10 elec. machines.
PP—3 Return tubular boilers, 1 Erie and 2 Union Iron Works, total 450 H.P., 2 gen. units, 250 volts A.C.
EMP—350. Last fiscal year output 403,000 tons.

Peters Creek No. 3, Drift, Pittsbugh Seam, 5 to 6 ft. thick.
PO—Epton, Pa.; SP—Wilson, Pa.; CTY—Allegheny; RR—P.R.R., Mon. Div.
gauge 43½ in.
S of M—Hand and 3 elec. machines.
S of H—Mules and 1 elec. loco.; track
PP—Power is furnished from No. 2 mine.

CRUCIBLE COAL CO.

Gen. Office, Empire Bldg., Pgh., Pa.
Crucible Mine, 2 Shafts, Pgh. Seam, 7½ ft. thick.
PO—Crucible, Pa.; SP—Same; CTY—Greene; RR—P.R.R., Mon. Div.
PR—C. C. Ramsey.....Pittsburgh, Pa.
TR—Geo. A. Turville, " "
GM—John C. Neff, " "
PA—John C. Neff, " "
GS—Robt. Holliday ......Crucible, Pa.
CE—H. J. Lewis,......Pittsburgh, Pa.
MM—Frank Booze........Crucible, Pa.
EM—Fayette Eng. Co., Uniontown, Pa.
SCO—Cumberland Supply Co. Buyer, B. A. Horner, Crucible, Pa.
S of H—4 gasoline loco. Track gauge 44 in.
S of M—11 elec. mach.
PP—6 water tube B. & W. boilers, total 1,500 H. P., 3 gen. units, 250 volts D. C., 1 comp. and 4 pumps.
EMP—350. Last fiscal year output 400,000 tons.

CUBA COAL CO.

Cuba No. 1, Gearhart, Jefferson, Colorado Nos. 3 ond 4; Mines; Drift; "E" Moshannon and "B" Seam; 3½ to 5ft. thick.
PO—Philipsburg, Pa.; SP—Some; CTY—Center; RR—P. R. R., N. Y. C. & H. R.
GM—George Trumble....Morrisdale, Pa.
S of H—Mules, track gauge 36 in.
S of M—Hand.
Sales Agency, H. B. Scott & Co., Philipsburg, Pa.

CUNARD COAL CO.

General Office, Philadelphia, Pa.
Cunard Mine; Slope; 54 to 60 in. thick.
PO—Morrisdale, Pa.; SP—Same; CTY—Clearfield; RR—N. Y. C. & H. R. R. R.
PR—Harry Boulton......Houtzdale, Pa.
TR—C. B. Maxwell, Morrisdale, Pa.
EM—LeBaron Smith, " "
GS—C. B. Maxwell ....Morrisdale, Pa.
..**PA**—C. B. Maxwell, " "
PA—C. B. Maxwell, " "
MS—R. F. Alstadt, " "
MM—O. M. Sutton, " "
EE—J. C. Noll, " "
SCO—Morrisdale Supply Co. Buyer, C. F. Penepacker, Morrisdale, Pa.
S of H—2 Elec. loco.; track gauge, 37 in.
S of M—5 elec. mach.
PP—Power purchased. 2 gen. units 500 volts D. C.
EMP—138. Last fiscal year output 98,214 tons.

CUNNINGHAM COAL CO.

Chicora Mine; Drift; Upper Freeport Seam, 44 to 50 in. thick.
PO—Chicora, Pa.; SP—Same; CTY—Butler; RR—B. & O., P. & W. Br.
PR—C. H. Johnson, Sr.....Chicora, Pa.
PA—Geo. H. Fox..........Chicora, Pa.
MS—Geo. H. Fox, " "
MM—Geo. H. Fox, " "
EE—Geo. H. Fox, " "
S of H—2 Elec. loco.; track gauge 30 in.
S of M—Hand and 2 Elec mach.
PP—I Water tube boiler, total 150 H. P., 1 gen. unit 275 volts D. C., 1 pump.
EMP 70. Last fiscal year output 47,097 tons.
Sales Agent, Geo. H. Fox, Chicora, Pa.

CYMBRIA COAL COMPANY.

General Office, Philadelphia, Pa.
Cymbria Mines; Drift and Shaft; "D" and "E" Seams, 48 to 60 in. thick.
PO—Cymbria Mines, Pa.; SP—Barnesboro, Pa.; CTY—Cambria. RR—P. R. R., Walnut Run Branch.
PR—David E. Williams....Phila., Pa.
TR—G. B. Roberts, " "
PA—A. Y. Stevenson, " "
GM—A. M. Riddell........Altoona, Pa.
MS—Harry Goodall . Cymbria Mines Pa.
CE—A. B. Critchton....Johnstown, Pa.
EM—A. B. Critchton, " "
SCO—Excelsior Store Co., Buyer, W. P. Griest, Cymbria Mines, Pa.
S of H—4 Elec. loco., track gauge 3 ft.
S of M—Hand and 3 Elec. mach.
PP—3 pumps. Power purchased.

EMP—125. Last fiscal yeor output 137,380 tons.
Sales Agent, David E. Williams & Co., Phila., Pa.

DALLIBA COAL CO.
General Office, Blairsville, Pa.
Dalliba Mine, Drift, Up. Freeport Seam, 5 ft. 3 in. thick.
PO—Leechburg, Pa.. SP—Bagdad, Pa.; CTY—Westmoreland; RR—P.R.R., Conemaugh Div.
PR—R. D. Grey........Blairsville, Pa.
TR—W. P. Graff, " "
GM—F. M. Graff, " "
CE—Albert Smith ......Saltsburg, Pa.
MS—L. E. Walheim, ...Leechburg, Pa.
SCO—Kiskiminetas Supply Co. Buyer, Wm. G. Fletcher, Blairsville, Pa.
S of H—2 Elec. loco. and mules; track gauge 40 in.
S of M—4 Elec. and 3 Comp. air mach. and hand.
PP—2 Boilers, 1 gen. unit, 250 volts D.C., 1 compressor and 1 pump.
EMP—120. Last fiscal year output 90,000 tons.
Sales agent, Knickerbocker Fuel Co., N. Y. City.

DOUGHERTY COAL COMPANY
Out of business.

DELMONT GAS COAL CO.
General Office, Park Bldg., Pittsburgh, Pa.
Drift Mine; Pittsburgh Seam; 86 in. thick.
PO—Delmont, Pa.; CTY—Westmoreland; RR—P. R. R., Turtle Creek Branch.
PR—E. M. Gross, ...Pittsburgh, Pa.
TR—Jas. H. Gallagher, " "
GM—E. M. Gross, " "
PA—Jas. H. Gallagher, " "
GS—M. R. Morris, ...Delmont, Pa.
CE—Robt. Morris......Greensburg, Pa.
S of H—Gravity.
S of M—Hand.
PP—Will buy power.
EMP—125. Output from 12-16-15 to 5-1-16, 36,393 net tons.

DERBY BRANCH COAL COMPANY.
Colorado Nos. 1 and 2, Drifts; Moshannon and "E" Seams; 3 ft. 6 in. thick.
PO—Philipsburg, Pa.; SP—Same; CTY—Center. RR—P. R. R., Derby Br.
PR—H. B. Scott......Philipsburg, Pa.
TR—H. B. Scott, " "
GM—Simeon Hartshorn,. " "
GS—Simeon Hartshorn, " "
PA—Simeon Hartshorn, " "
S of H—Mules, track gauge 36 in.
Sales Agent, H. B. Scott & Co., Philipsburg, Pa.

DERINGER BROS.
Woodland Colliery No. 2, Drift, "D" Seam, 4 to 4 ft. 8 in. thick.
PO—Spangler, Pa.; SP—Garman, Pa.; CTY—Cambria; RR—P. R. R., Moss Creek branch.
GM—W. Deringer ......Spangler, Pa.
GS—W. Deringer, " "
PA—W. Deringer, " "
MS—H. L. Rogers.....Barnesboro, Pa.
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—1 Gasoline pump.
EMP—65. Last fiscal year output 50,000 tons.

DEXTER & CARPENTER, Inc.
Gen. Office, 12 Broadway, New York, N.Y.
PR—Geo. M. Dexter, New York, N.Y.
GM—Geo. M. Dexter, " " "
PA—Geo. M. Dexter, " " "
TR—Wm. Carpenter, " " "
Sec'y—Ralph Neilson, " " "
GS—Jos. J. McCann......Lloydell, Pa.
CE—Andrew B. Crighton, Johnstown. Pa.
SCO—Ashville Supply Co., Ashville, Pa.
Sales Agent, Dexter & Carpenter, Inc., No. 12 Broadway, New York, N. Y.

Claire Mine; Drift; "E" Seam, 42 in. thick.
PO—Ashville, Pa.; SP—Same; CTY—Cambria; RR—P. R. R., C. & I. Br.
S of H—Mules and rope.
S of M—Hand.

Leland Nos. 1 and 10 Mines, Drift, Moshannon Seam, 28-32 in. thick.
PO—Beccarria, Pa.; SP—Smoke Run, Pa.; CTY—Cambria; RR—P.R.R., Moshannon Branch.
MS—Ed. Casker ....Beccarria, Pa.
S of H—Gasoline motor and mules· track gauge 36 in.
S of M—Hand.
PP—1 Return tubular boiler.
EMP—90. Last fiscal year output 70,000 tons.

Lloydell No. 1 Mine, Drift, "B" Seam, 3½ ft. thick.
PO—Lloydell, Pa.; SP—Same; CTY—Cambria; RR—P.R.R., South Fork Branch.
MS—Lewis Johnson ......Lloydell, Pa.
S of H—Tail rope; track gauge 36 in.
S of M—Hand.
EMP—42. Last fiscal year output 30,000 tons.

DIAMOND COAL & COKE CO., THE
Gen. Office, 1108 House Bldg., Pgh.,Pa.
PR—J. H. McCrady.....Pittsburgh, Pa.
TR—A. H. Stolzenbach, " "
GM—A. H. Stolzenbach, " "
GS—A. R. Budd, " "
PA—A. J. Soisson, " "
CE—Geo. S. Baton & Co., " "
SCO—West Brownsville Supply Co., Buyer S. A. Barnum.

Diamond Mine, Slope, Pgh. Seam, 7 to 8 ft. thick,
PO—West Brownsville, Pa.; SP—Same; CTY—Washington; RR—P. R. R., Mon. Div.
MS—S. V. Hartman, W.Brownsville Pa.
S of H—3 Elec. loco. and mules; track gauge 44 in.
S of M—7 Elec. machines.
PP—6 Return tubular boilers, total 900 H.P., 2 gen. units, 250 volts D.C., 2 pumps.
Days worked, 246. Last fiscal year output 441,884 tons.

Huston Run Mine, Drift, Pgh Seam, 5 to 6 ft. thick.
PO—Courtney, Pa.; SP—Same; CTY—Washington; RR—P.R.R., Mon. Div.
MS—G. G. Gillingham...Courtney, Pa.
SM—J. Jackman, " "
S of H—Mules and 3 elec. loco.; track gauge 44 in.
S of M—6 Elec. machines.
PP—3 Return tubular boilers, total 450 H. P., 2 pumps, 3 gen. units.
Days worked, 273. Last fiscal year output 450,430 tons.

DIAMOND SMOKELESS COAL CO.
Diamond Mine; Drift "B" Coal Seam; 39 to 48 in. thick.
PO—Seward, Pa SP—Same; CTY—Westmoreland; RR—Penna., West Penn Division.
PR—Chas. A. Owen, Johnstown, Pa.
GS—Chas. A. Owen, " "
MS—Chas. A. Owen, " "
TR—Frank D. Baker, " "
EE—Irwin Wilhelm, " "
S of H—2 elec. locos. Track gauge 36 in.
S of M—3 elec. machs.
PP—Purchase power.
EMP—90. Daily output, 400 tons.
Note—Successors to Cramer Coal, Coke & Stone Co.

DILLTOWN SMOKELESS COAL CO.
Dilltown No. 1 Mine; Drift; "B" Seam, 44 to 52 in. thick.
PO—Dilltown, Pa.; SP—Same; CTY—Indiana; RR—P. R. R., B. R. & P., Cresson and Blacklick Br.
PR—Dr.T.R.Williams, Punxsut'w'y, Pa.
TR—S. S. Henderson, Brookville, Pa.
GM—E. E. Hewitt, ...Dilltown, Pa.
GS—E. E. Hewitt, " "
PA—E. E. Hewitt, " "
EM—E. E. Hewitt, " "
CE—C. M. Means......Pittsburgh, Pa
S of H—2 elec. loco. Track gauge 42 in.
S of M—5 elec. mach.
PP—Power purchased.
EMP—120. Last fiscal year output 42,000 tons.

DIXONVILLE COAL CO.
General Office, Johnstown, Pa.
Randolph No. 2 Mine, Drift, "D" Seam, 3 to 4 ft. thick.
PO—Dixonville, Pa.; SP—Same; CTY—Indiana. RR—P. R. R., Cresson and Cherry Tree Br.
PR—W. J. Kuntz......Johnstown, Pa.
TR—Geo. T. Robinson, " "
GM—James Waddell......Dixonville, Pa.
PA—James Waddell, " "
MS—James Waddell, " "
EM—S. E. Dickey......Johnstown, Pa.
S of H—Mules, track gauge 3 ft.
S of M—Hand.
EMP—45. Last fiscal year output 30,817 tons.
Sales agent, W. J. Kuntz, Johnstown Pa.

DOLLIE COAL MINING CO., (THE) ...
Dollie Mine; Drift; Moshannon or "D" Seam (Two openings on same hill, worked together, using same tipple.)
PO—Osceola Mills, Pa.; SP—Same; CTY—Clearfield; RR—P.R.R., Tyrone & Clearfield.
PR—James R. Somerville..Wigton, Pa.
TR—S. Blain Stine..Osceola Mills, Pa.
PA—S. Blain Stine, " " "
MS—Jas. R. Somerville....Wigton, Pa.
S of H—Mules.
S of M—Hand.

DOMESTIC COAL COMPANY
See Valley Camp Coal Co.

DOMINION COAL CO.
General Office, Pittsburg, Pa.
PR—R. C. Masten......Pittsburg, Pa.
TR—R. C. Masten, " "
CE—John M. Rayburn, " "
GM—R. C. McLean......Oakmont, Pa.
PA—R. C. McLean, " "
GS—H. A. Turner.....Kittanning, Pa.
Sales Agency, Producers Supply Co.; Sales Mgr., John Robinson, Pittsburg, Pa.

Dominion Mine; Drift; Up. Freeport Seam, 42 in. thick.
PO—Cowanshannock, Pa.; SP—Same, CTY—Armstrong; RR—P. R. R., B. & A. V. Div.
S of H—1 Elec. loco.
S of M—3 Elec. mach.
PP—Power purchased, 2 pumps.
Last fiscal year output 60,000 tons.

Dandy Mine; Drift; Pgh. Seam; 66 to 72 in. thick.
PO—Canonsburg, Pa. R. D. No. 1,; SP—Houston, Pa,; CTY—Washington; RR—P. R. R., Wash. Br.
MS—Alex Gray..........Houston, Pa.
S of H—Rope.
S of M—6 comp. air mach.
EMP—80. Last fiscal year output 70,000 tons.

DONOHOE COKE CO.
General Office, Greensburg, Pa.
Donohoe Mine; Slope; Pittsburgh Seam, 84 in. thick.

PO—Greenwald, Pa. SP—Same. CTY—Westmoreland; RR—P. R. R., New Alexandria Br.
PR—John P. Donohoe...Greensburg, Pa.
TR—Edw. E. Donohoe, " "
GM—John P. Donohoe, " "
PA—J. J. Joyce ......Greenwald, Pa.
MS—C. Rae King, " "
SCO—John P. Donohoe & Co., Ltd. Buyer, J. J. Joyce, Greenwald, Pa.
S of H—3 Elec. loco.; track gauge 44 in.
S of M—Hand.
PP—4 boilers, total 600 H. P., gen. unit 250 volts D. C., 1 compressor and 3 pumps.
EMP—200. Coke ovens, 193. Last fiscal year output 181,147 tons.

DORNON COAL COMPANY
Stickel Mine; Drift; L. Kittanning Seam, 60 in. thick.
PO—Connellsville, Pa.; SP—Stewarton; CTY—Fayette; RR—B. & O.
PR—John Dornon.....Connellsville, Pa.
PA—John Dornon, " "
GM—John Dornon, " "
TR—Nora Dornon, " "
MS—John Cox.........Mill Run, Pa.
S of H—Mules.
EMP—15. Sales agency, Superior Coal Co., Connellsville, Pa.
Note—Formerly the Stewarton Coal Co.

DUNBAR COAL MINING CO.
General Office, Altoona, Pa.
Fairmount Mine, Drift, Moshannon Seam, 4 ft. 2 in. thick.
PO—Osceola Mills, Pa.; SP—Same; CTY—Clearfield; RR—P.R.R.
GM—C. S. Myers.......Altoona, Pa.
PA—C. S. Myers, " "
MS—James Dugan, Osceola Mills, Pa.
S of H—Mules; track gauge 36 in.
S of M—Hand.
EMP—24.

DUNCAN-SPANGLER COAL CO.
General Office, 305 Finance Bldg., Philadelphia, Pa.
PR—Jos. H. Reilly......Phila., Pa.
GM—Jos. H. Reilly, " "
TR—Jos. B. Campbell
PA—John E. Reilly......Spangler, Pa.
GS—John E. Reilly, " "
EM—C. S. Schlicher, " "
EE—Jos. Clark, " "
SCO—C. R. Jones & Co., Buyer C. R. Jones, Spangler, Pa.
Sales Agent, Jos. H. Reilly Phila., Pa.

Delta Mine; Drift; "D" Seam, 46-54 in. thick.
PO—Spangler, Pa.; SP—Barnesboro, Pa.; CTY—Cambria; RR—P.R.R., Walnut Run Br. of C.&C. Div.
MS—Wm. H. Young....Barnesboro, Pa.
S of H—Mules and rope, track gauge 36 in.
S of M—12 Comp. air mach.
PP—2 Erie return tubular boilers total 160 H. P., 3 steam engines, 1 comp. and 4 pumps.
EMP—125. Last fiscal year output 82,166 tons.

Blubaker Mine No. 13, Drift, "D" Seam, 40-44 in. thick.
PO—Spangler, Pa.; SP—Same; CTY—Cambria: RR—P. R. R., C.&C. Div.
MS—James Logan......Spangler, Pa.
S of H—2 Elec. loco., track gauge 36 in.
S of M—2 Elec. mach. and hand.
PP—3 Erie return tubular boilers, total 260 H. P., 2 steam engines. 1 pump.
EMP—63. Last fiscal year output 31,883 tons.

DUNHAM, F. J. & CO.
Royal No. 2 Mine, Drift, "B" Seam, 3½ to 4 ft. 2 in. thick.
PO—Philipsburg. Pa. SP—Same. CTY—Centre. RR—N. Y. C.
GM—George Stott......Philipsburg, Pa.
PA—George Stott, " "
MS—John T. Harvey, " "
S of H—Mules.
S of M—Hand.
EMP—65.

DUNKIRK GAS COAL CO.
General Office, Fulton Building, Pittsburgh, Pa.
PR—H. A. Kuhn ......Pittsburgh, Pa.
CE—H. A. Kuhn, " "
TR—E. S. Wallace, " "
GM—H. K. Knopf, " "
PA—H. K. Knopf, " "
EM—H. K. Knopf, " "
SCO—Miners Supply Co. Buyer, W. S. McElhose, Pittsburgh, Pa.
Sales agents, H. A. Andrews and T. S. Bailie, Pittsburgh, Pa.

Acme No. 1 Mine, Shaft, Pgh. Seam, 6 ft. thick.
PO—Bentleyville, Pa. SP—Same. CTY—Washington. RR—P. V. & C., Ellsworth Branch.
MS—Thos. H. Tudor...Bentleyville, Pa.
SM—J. A. Kensinger, " "
S of H—Elec. loco. and mules. Track gauge 44 in.
S of M—15 elec. mach.
PP—5 return tubular boilers, total 750 H. P., 5 gen. units and 2 pumps.
EMP—398. Last fiscal year output 321,680 tons.

Dunkirk Mine, Slope, Pgh. Seam, 6 ft. thick.
PO—Monongahela City, Pa., R. F. D. SP—Frye, Pa. CTY—Washington. RR—P. V. & C., Ellsworth Br.
MS—Jas. L. Maize, RFD, Monongahela City, Pa.
SM—J. P. Taylor RFD, Monongahela City, Pa.
S of H—3 elec. locos., mules and rope.
S of M—9 elec. mach.
PP—3 return tubular boilers, total 450 H. P., 2 gen. units and 2 pumps.
EMP—259. Last fiscal year output 225,888 tons.

DUNLAP C. A.
General office, Houtzdale, Pa.
Dunlap No. 1 Mine; Drift E. & D. Seam; 34 to 72 in. thick.
PO—Houtzdale, Pa.; SP—Same; CTY—Clearfield; RR—Penna., Washington Branch.
PR—C. A. Dunlap.......Houtzdale, Pa.
GM—C. A. Dunlap, " "
PA—C. A. Dunlap, " "
MS—C. A. Dunlap, " "
S of H—Mules.
S of M—Hand.
EMP—18. Last fiscal year output 10,000 tons.

DUNNE COAL & COKE CO.
General Office, Germania Bank Bldg., Pittsburg, Pa.
Nelson's Bridge Mine; Drift; Brookville Seam, 38 to 56 in. thick.
PO—Branchton, Pa.; SP—Nelsons Bridge, Pa.; CTY—Butler; RR—B. & L. E.
PR—R. O. Dunne......Pittsburg, Pa.
TR—John Wilfred Ely, " "
PA—John Wilfred Ely, " "
GM—W. J. Koerner....Branchton, Pa.
MS—W. J. Koerner, " "
EM—W. J. Koerner, " "
MM—Thomas J. Simpson, " "
SCO—Ely Supply Co., " "
S of H—Mules.
S of M—3 Elec. mach.
PP—Boiler, 250 H. P., 3 elec. pumps.
EMP—32. Output to be 300 tons per day.
Sales Agent, R. O. Dunne, Pittsburg, Pa.

DUQUESNE COAL & COKE CO.
General Office, Pittsburgh, Pa.
Aurora Mine, Drift, Pgh. Seam.
PO—Avella, Pa. SP—Same. CTY—Washington. RR—Wabash & Pgh. Terminal.
PR—Geo. W. Theiss....Pittsburgh, Pa.
TR—Geo. W. Theiss, " "
GM—A. G. Leonard,.......Avella, Pa.
PA—A. G. Leonard, " "
GS—A. G. Leonard, " "
EM—Andrews & Southard, Pittsburg, Pa.
CE—Andrews & Southard, " "
MS—Chris Neicer..........Avella, Pa.
MM—Earnest Nonnassi, " "
EE—Thos. Twyman, " "
S of H—Elec. motors.
S of M—Elec. machines.
PP—2 boilers, 1 gen. unit, 250 volts D. C.

DUSHAN COAL MINING CO.
General Office, Osceola Mills, Pa.
DuShan No. 1 Mine; Drift; B Seam;
PO—Osceola Mills, Pa.; SP—Same; CTY—Clearfield; RR—Penna., Trout Run branch.
PR—James M. Hatton, Osceola Mills, Pa.
TR—James F. Dugan, " "
GM—James F. Dugan, " "
GS—John J. Dugan, " "
MS—John J. Dugan, " "
CE—H. S. Shillingford, " "
S of H—Mules.
S of M—Hand.
PP—3 pumps. Purchase power.
EMP—76. Last fiscal year output, 67,110 tons.

EAGLE COAL CO.
General Office, Buffalo, N. Y.
GM—W. D. Ward......Buffalo, N. Y.
GS—H. H. Moody.........Fredell, Pa.
PA—H. H. Moody.........Fredell, Pa.
EM—H. E. Robinson, " "
EE—Wm. Weeter, " "
SCO—Fredell Supply Co., Buyer, A. L. Pritner.
Eagles Nos. 4 and 5 Mines; Drift; Up. Kittanning Seam, 3 to 4½ ft. thick.
PO—Fredell, Pa., SP—Upper Hillville, Pa.; CTY—Clarion; RR—P.R.R. B. & A. V. Div.
S of H—Mules and rope.
S of M—7 Comp. air mach and hand.
PP—2 Titusville, return tubular boilers, total 230 H. P., 2 compressors.
EMP—125. Last fiscal year output 71,088 tons.

Glenora Mine; Drift; Lower Kittanning Seam, 41 in. thick.
PO—Catfish, Pa.; SP—Catfish Run, Pa.; CTY—Clarion; RR—Penna., B. & A. V. Div.
S of H—1 Elec. loco.; track gauge 29 in.
S of M—3 Elec. mach.
PP—1 Erie return tubular boiler, 1 gen. unit, 280 volts D. C., 2 pumps.
EMP—150.
(Old information.)

EAGLE VALLEY COAL CO.
Drift Mine; Upper Freeport Seam, 48 in. thick.
PO—Brookville, Pa.; SP—Ringgold, Pa.; CTY—Jefferson; RR—P. S. & N.
PR—H. J. Hutchison, Brookville, Pa.
GS—H. J. Hutchison, " "
TR—F. L. Verstine, " "
GM—F. L. Verstine, " "
PA—F. L. Verstine, " "
EM—Frank Arthurs, " "
MS—C. C. Martz, " "
S of H—Mules.
S of M—7 Comp. air mach.
PP—2 Water tube boilers, 1 compressor, 2 pumps.
EMP—90.
Sales Agent, N. N. Ray, Brookville, Pa.

EAST FAYETTE COAL CO.
General Office, 1st Natl. Bank Bldg., Scottdale, Pa.
Torrence Mine; Drift; "B" Seam; 42 in. thick.
PO—Ohio Pyle, Pa.; SP—Same; CTY—Fayette; RR—Western Maryland.
PR—Jno. F. Torrence, Connellsville, Pa.
TR—M. L. Hasness.....Scottdale, Pa.
PA—E. L. Stoner " "
S of H—Mules.
S of M—Hand.

EASTERN BITUMINOUS COAL MINING BONDS.
General Office, Altoona, Pa.
Dean Nos. 8 and 10; Slope and Drift; "E" and "C" Prime, 3 to 6ft. thick; washery, not operated.
PO—Frugality, Pa.; SP—Same; CTY—Cambria.
RR—P.R.R., C & I. Div.
GM—F. P. McFarland..Altoona, Pa.
CE—J. S. Sillyman & Co., " "
GS—H. L. Binnix....Frugality, Pa.
PA—H. L. Binnix, " "
PA—H. L. Binnix, " "
MM—C. L. Troxell, " "
EE—C. L. Troxell, " "
SCO—Frugality Merchandise Co., Buyer F. P. McFarland, Frugality, Pa.
SM—H. L. Binnix......Frugality, Pa.
S of H—5 Elec. loco., rope and mules track gauge 36 in.
S of M—10 comp. air mach. hand;
PP—4 Return tubular, Erie boilers, total 285 H. P., 3 return tubular, Phoenix boilers, total 450 H. P., 2 gen. units 250 volts D. C., 1 compressor.
EMP—250. Last fiscal year output 84,000 tons. Coke ovens, 99.
Dean No. 9 not operated.
Sales agent, F. P. McFarland, Altoona, Pa.

EASTON COAL CO.
Howard Mine; Drift "C" Prime Seam, 43 in. thick.
PO—Mahaffey, Pa.; SP—Same; CTY—Clearfield; RR—P. R. R.
PR—A. D. Lydic........Mahaffey, Pa.
GM—A. D. Lydic, " "
GS—A. D. Lydic, " "
MS—Wm. Gensler, " "
S of H—Mules.
S of M—Hand.
EMP—14. Output for 60 days 2,830 tons.

EBENSBURG COAL CO.
General Office, Philadelphia, Pa.
Ebensburg No. 1 Mine, Drift, "B" Seam 38 to 48 in. thick.
PO—Colver, Pa. SP—Same. CTY—Cambria. RR—P. R. R.
PR—J. H. Weaver...Philadelphia, Pa.
TR—J. E. Wilkinson, " "
PA—J. E. Wilkinson, " "
ASST TO PR—J. F. Macklin, Colver, Pa.
GM—D. Fleming, " "
MS—P. M. Saxman........Colver, Pa.
EM—D. G. Mahaffey.....Colver, Pa.
MM—L. E. Butterbaugh, " "
SCO—Colver Store Co. Buyer, W. H. Troxell, Colver, Pa.
S of H—16 elec. locos.
S of M—42 elec. punchers, 18 elec. chain machs.
PP—4 Sterling, water tube boilers, total 1,480 H. P., 3 gen. units, 2,300 volts A. C., 3 phase, 60 cycles, 250 volts D. C., 9 pumps.
EMP—900. Last fiscal year output 976,956 tons.

ECHARD COAL & COKE CO
General Office, Connellsville, Pa.
Murphy Mine Drift. Pgh. Seam 8-9 ft. thick.
PO—Star Junction, Pa.; SP—Same; CTY—Fayette.
RR—P. & L. E.
PR—W. W. Smith...Connellsville, Pa.
TR—J. T. Johnston.Star Junction, Pa.
SM—Johnston Supply Co,. Star Junction, Pa.
S of H—Mules and engine; Track gauge 42 in.
S of M—Hand.
EMP—55: Coke ovens 60 Bee Hive.
Last fiscal year output 11,094 tons coke.

EGOLF COAL MINING COMPANY
Katherine No. 1 Mine; Drift; Lower Kittanning or B Seam; 44 to 53 in. thick.
PO—Cainbrook, Pa.; SP—Same; CTY—Somerset; RR—Penna.; South Fork Branch.
PR—M. E. McNeal......Windber, Pa.
TR—Mrs. M. E. McNeal, " "
GM—M. E. McNeal " "
GS—E. C. Mangus.....Cairnbrook, Pa.
PA—Wm. Koontz, " "
SM—C. D. Lloyd, " "
S of H—Mules. Track gauge 42 in.
S of M—Hand.
EMP—60. Last fiscal year output 40,350 tons.

EICHELBERGER, E. & SON.
General Office, Saxton, Pa.
Bacon Nos. 1 and 2 Mines, Drifts, Barnett Seam.
PO—Six Mile Run, Pa. SP—Coaldale, Pa. CTY—Bedford. RR—H. & B. T.
GM—J. A. Eichelberger....Saxton, Pa.
PA—J. A. Eichelberger, " "
SM—J. A. Eichelberger, " "
MS—Wm. E. Williams.Six Mile Run,Pa.
S of H—Mules and gravity.
S of M—Hand.
EMP—100.
(Old information.)

ELECTRIC COAL CO.
Electric Nos. 7 & 8 Mines; Drift and Slope; "D" and "C" Seams; 30 in. to 78 in. thick.
PO—Glen Campbell, Pa.; SP—Same; CTY—Indiana. RR—N.Y.C.
TR—S. L. Clark, Commercial Trust Bldg., Philadelphia, Pa.
GS—J. H. Miller....Glen Campbell, Pa.
PA—J. H. Miller, " "
MS—Jno. Baird, " "
SM—W. S. Martz, " "
S of H—Rope. Track gauge 3 ft.
S of M—Hand and 1 Elec. mach.
PP—2 Return tubular boilers, 2 gen. units; 1 pump; also purchase power.
EMP—60. Last fiscal year output 50,000 tons.
Sales agent, Clark Bros. Coal Mng. Co. and Irish Bros.

ELK LICK COAL CO.
Name changed to Beachly Coal Co.

ELLSWORTH COLLIERIES CO.
General Office, Lackawanna, N. Y.
PR—E. A. S. Clarke 2 Rector St., New York, N. Y.
TR—J. P. Higginson.Lackawanna, N.Y.
VP—C. H. McCullough, Jr., " "
GM—C. H. McCullough, Jr., " "
PA—F. H. Burnett, " "
EM—W. A. James, " "
GS—W. A. Luce, Farmers Bank Bldg., Pittsburgh, Pa.
SCO—Wehrum Supply Co. Buyer, John W. Hugus, Ellsworth, Pa.
No. 1 Mine, Shaft, Pgh. or River Seam, 5 ft. 10 in. thick. Operate washery.
PO—Ellsworth, Pa. SP—Same. CTY—Washington. RR—P. R. R., Monongahela Div.
MS—W. E. Lahm ......Ellsworth, Pa.
S of H—25 elec. locos. Track gauge 42 in.
S of M—Hand and 18 elec. machines.
PP—6 Sterling water tube boilers, total 2,400 H. P., 4 gen. units, 3 D. C., 230 volts D. C. and 1 A. C., 60 cycles, 1 pump.
EMP—496. Last fiscal year output 589,000 tons. Coke ovens, 205,-Bee Hive.

No. 2 Mine, Shaft, Pgh. or River Seam, 5 ft. 10 in. thick.
PO—Ellsworth, Pa. SP—Same. CTY—Washington. RR—P. R. R., Monongahela Div.
MS—W. E. Lahm, .. Ellsworth, Pa.
S of H—20 elec. locos. Track gauge 3½ ft.
S of M—Hand and 17 elec. machines.
PP—11 Erie City and other return tubular boilers, total 1,375 H. P., 2 gen. units, 2,300 volts A. C., 60 cycles, 2 pumps.
EMP—519. Last fiscal year output 549,000 tons.

Nos. 3 and 4 Mines, Shaft, Pgh. or River Seam, 5 ft. 10 in. thick. Operate 2 washeries.
PO—Ellsworth, Pa. SP—Same. CTY·Washington. RR—P. R. R. Monongahela Div.
MS—W. E. Lahm.....Ellsworth, Pa.
SM—Frank Kocher.......Cokeburg, Pa.
S of H—20 elec. locos. Track gauge 42 in.
S of M—Hand and 19 elec. mach.
PP—(3) 4 Stirling and (4) 8 Stirling water tube boilers, total 2,600 H. P., 2 gen. units, 250 volts D. C. 3 pumps.
EMP—359. Last fiscal year output 576,800 tons. Coke oven, 285,-Bee Hive.

ELLSWORTH-DUNHAM COAL CO.
General Office, St. Benedict, Pa.
Victor Nos. 11 and 14, Drift and Slope, Lower Freeport Seam, 34 to 42 in. thick.
PO—Arcadia, Pa. SP—Same. CTY—Indiana. RR—N. Y. C.
PR—Rembrandt Peale....Winburne, Pa.
GS—R. H. George, " "
EM—Merritt Hutton..St. Benedict, Pa.
EE—E. K. Davis, " "
S of H—4 elec. locos. and rope. Track gauge 36 in.
S of M—7 elec. mach.
PP—5 return tubular boilers, total 750 H. P., 2 150 K. W. gen. units, 250 volts D. C., 2 pumps.
EMP—150. Last fiscal year output 189,000 tons.

ELSS COAL COMPANY.
Lessee of Pennsy Coal Co.
Elss Mine; 36 to 42 in. thick.
PO—Strattonville, Pa. SP—Same; CTY—Clarion; RR—L. E. F. & C.
TR—J. M. Harvey, .. Strattonville, Pa.
SM—J. M. Harvey, " "
MF—J. N. Beveridge, " "
S of H—Mules and rope. Track gauge 36 inches.
S of M—Hand.
EMP—16. to 24.

EMPIRE COAL MINING CO.
General Office, 418 Stephen Girard Bldg., Philadlphia, Pa.
PR—Wm. A. Webb..Philadelphia, Pa.
TR—G.Webb Shillingford, Clearfield, Pa.
GM—G.Webb Shillingford, " "
PA—G. Webb Shillingford, Clearfield, Pa.
EM—Chas. E. Schlicher....Spangler, Pa.
EM—Thomas Pealer........Indiana, Pa.

Empire "A", Drift, Moshannon Seam, 4½ to 5 thick.
PO—Barnesboro, Pa., SP—Same, CTY—Cambria. RR—N. Y. C.
MS—Wm. R. Leadbetter, Barnesboro, Pa.
S of H—Mules and 3 Elec. loco. Track gauge 36 inches.
S of M—Hand and 20 Comp. air mach. thick.
PP—5 Return Tubular Erie and Keeler boilers, total 460 H. P., 2 Gen. units, 250 volts D. C. 2 Air Compressors.
EMP—173. Last fiscal year output 118,536 tons.

Empire "M" Mine; Drift; Miller Seam, 36 in. thick.
PO—Clymer, Pa., SP—Same, CTY—Indiana.
RR—N. Y. C.
MS—James St. Clair....Clymer, Pa.
S of H—Mules and 2 elec. loco. Track gauge 36 in.
S of M—22 Comp. air mach.
PP—4 Keeler return tubular boilers, total 550 H. P., 1 gen. unit 250 volts D. C., 2 compressors.
EMP—196. Last fiscal year output 116,411 tons.
Empire "R", Drift, Miller Seam, 3 to 4 ft. thick.
PO—Clymer, Pa., SP—Same, CTY—Indiana.
RR—N. Y. C.
MS—Amiel Clemenson......Clymer, Pa.
S of H—Mules, and 1 elec. loco. Track gauge 36 in.
S of M—Hand.
EMP—72. Last fiscal year output 35,651 tons.
Sales Agents, Empire Coal Mng. Co., Philadelphia, Pa.

EMPORIUM IRON CO.
General Office, Emporium, Pa.
Round Top Mine, Drift, Freeport Seam.
PO—Canoe Run, Pa. SP—Same. CTY—Cameron. RR—P. R. R.
GM—C. J. Goodnough..Emporium, Pa.
PA—C. J. Goodnough, " "
MS—C. J. Goodnough, " "
SM—Furnace Supply Co. Buyer, F. L. Webster, Canoe Run, Pa.
S of H—Mules.
S of M—Hand and 1 loco.
EMP—100.
Idle for past 2 years.

ENTERPRISE COAL CO.
Ponfeigh Mine, Drift; "C" Prime Seam 3 ft. 9 in. to 4 1-2 ft. thick.
PO—Garrett, Pa.; SP—Same; CTY—Somerset.
RR—B. & O., Berlin Branch.
PR—W. A. Merrill......Garrett, Pa.
PA—W. A. Merrill, " "
TR—W. A. Merrill, " "
GM—J. B. Walker, " "
GS—J. B Walker, " "
EM—J. T. Titney, " "
MM—Edward Johnson, " "
EE—James Fletcher " "
SCO—Enterprise Supply Co., Buyer W. A. Merrill.
S of H—3 Elec. loco., 40 in. track gauge.
S of M—1 Elec. mach. and hand.
PP—3 Return tubular, Erie City, boilers, total 330 H. P., 1 gen. unit 250 volts D. C.
EMP—92. Last fiscal year output 99,000 tons.

ERIE COAL & COKE CO.
Keystone Nos. 1 and 2 Mines; Drifts; B Seam, 44 to 65 in. thick.
PO—Ferris, Pa.; SP—Same; CTY—Butler; RR—B. & L. E.
TR—C. E. Deal.........Meyersdale, Pa.
GM—Levi Deal........Grove City, Pa.
PA—Levi Deal, " "
MS—Levi Deal, " "
CE—L. E. Burnside & Co. " "
MM—O. J. Gillespie.......Ferris, Pa.
EE—O. J. Gillespie, " "
SCO—Bessemer Merc. Co., Buyer, Henry F. Brant, Ferris, Pa.
S of H—4 elec. loco.
S of M—Hand and 2 elec. and 6 comp. air mach.
PP—5 Return tubular boilers, total 610 H. P., 1 gen. unit 250 volts D. C., 1 compressor and 4 pumps.
EMP—125. Last fiscal year output 100,000 tons.

ETNA-CONNELLSVILLE COKE CO.
General Office, Connellsville, Pa.
Garwood Mine; Shaft and slope; Pgh. Seam 8-9 ft. thick.
PO—R. D. No. 20 Brownsville, Pa. SP—Simpson, Pa.; CTY—Fayette. —P. R. R., Monon. Br.
PR—Cyrus Echard....Connellsville, Pa.
TR—J. L. Fritsch, " "
GM—Geo. W. Campbell, " "
PA—Geo. W. Campbell, " "
CE—Geo. W. Campbell, " "
MS—John Harding, ..Brownsville, Pa.
SCO—Dunlap Supply Co., Buyer, Geo. W. Campbell, Connellsville, Pa.
S of H—Mules. Track gauge 42 in.
S of M—10 Comp. air mach. and hand.
PP—2 Return tubular boilers total 250 H. P. 1 compressor and 1 pump.
EMP—119; Coke ovens, 119 Bee Hive.
Last fiscal year output 72000 tons.

EUCLID COAL & COKE CO.
Euclid Mine; Slope; Kittanning Seam, 34 to 48 in. thick.
PO—Euclid, Pa.; SP—Same; CTY—Butler; RR—B. & L. E., Main Line.
PR—Thos. W. Keighley..Uniontown, Pa.
TR—Chas. Keighley, " "
June 25, 1915, new company slope sunk within 20 ft. of coal.

EVANS COAL & COKE CO.
General Office, Connellsville, Pa.
Evans Nos. 1, 2 and 3 Mines; Slope; Up. Freeport Seam, 72 in. thick.
PO—Uniontown, Pa.; SP—Evans Statione Pa.; CTY—Fayette; RR—B. & O., P. R. R.

PR—A. C. Stickel....Connellsville, Pa.
GM—A. C. Stickel, " "
PA—A. C. Stickel, " "
GS—Perry McClain.....Uniontown, Pa.
MS—Geo. McLaughlin, " "
CE—Albert Smith.......Saltsburg, Pa.
MM—Perry McClain,....Uniontown, Pa.
EE—Perry McClain, " "
SCO—Evans Supply Co.; Buyer, Chas. Buttermore, R. F. D. No. 1, Uniontown, Pa .
S of H—Rope and mules; track gauge, 36 and 42 in.
S of M—6 Elec. mach. and hand.
PP—Power purchased, 6 pumps.
EMP—250. Last fiscal year output, 200,000 tons

EXPORT COAL CO.
General Office, Pittsburg, Pa.
Spring Hill Mine; Drift and Incline, Seam 66 to 72 in. thick.
PO—Trafford, Pa.; SP—Same; CTY—Westmoreland; RR—P. R. R.
PR—James S. Pates........Irwin, Pa.
GM—James S. Pates, " "
GS—James S. Pates, " "
EM—ames S. Pates, " "
TR—F. G. Lamb........Pittsburg, Pa.
MS—J. J. McAlister....Trafford, Pa.
S of H—1 Elec. loco.
S of M—2 Elec. mach.
PP—Power purchased.
EMP—150.
New mine.

FAIRCHANCE COAL & COKE CO.
General Office, Uniontown, Pa.
Dougherty and Shannon Mines; Drifts; Pittsburgh Seams; 84 to 108 in. thick.
PO—Fairchance, Pa.; SP—Same; CTY—Fayette; RR—B. & O.
GM—Geo. H. Bortz,....Uniontown, Pa.
PA—Geo. H. Bortz, " "
S of H—Mules. Track gauge 35 in.
S of M—Hand.
EMP—18. Daily output, 100 tons. 6 Bee Hive Coke Ovens.
Note—Successors to Shannon Coal & Coke Co.

FAIRFIELD COAL & COKE CO.
General Office, Bolivar, Pa.
Fairfield Mine; Drift; "E" or Upper Freeport Seam; 48 to 84 in. thick.
PO—Bolivar, Pa.; SP—Lockport. Pa.; CTY—Westmoreland; RR—Penna., New Florence branch.
PR—C. G. Robinson......Jeannette, Pa.
TR—John S. Shannahan, " "
GM—U. S. Byers,.........Bolivar, Pa.
PA—U. S. Byers, " "
GS—John MacPherson, " "
MS—John MacPherson, " "
CE—B. R. Hebrandt, " "
EE—Jas. Shuttleworth, " "
SM—A. D. Thomas, " "
SCO—Fairfield Supply Co.
S of H—1 elec. loco. Track gauge 42 in.
S of M—Hand.
PP—Purchase power.

FAIRMOUNT COAL & COKE CO.
General Office 306 Ellicott Sq., Buffalo, N. Y.
Nos. 6,8 and 9 Mines; Drift.
L. and up. Freeport and Kittanning; Seams; 4 to 6 ft. thick.
PO—New Bethehem, Pa.; SP—Same and Oak Ridge, Pa.; CTY—Armstrong.
RR—P. R. R., Oak Ridge & Bostonia Branch.
GM—J. A. Bean, New Bethlehem, Pa.
SCO—Fairmount Store Co., Inc., Buyer George Imhof, New Bethehem, Pa.
S of H—Rope and mules. Track gauge standard.
S of M—Comp. air elec. mach. and hand.
PP—6 Boilers, gen. units 500 volts D. C.

FALL BROOK COAL CO.
General Office, Corning, N. Y.
"Anna S" Mine, Drift, Blossburg Seam, 4 to 3 ft. thick.
PO—Antrim, Pa., SP—Same. CTY—Tioga; RR—N. Y. C. & H. R. R.
PR—John Magee......Corning, N. Y.
TR—John H. Lang, " "
GM—William Howell.....Antrim, Pa.
PA—W. J. Howell, " "
MS—James Pollock, " "
S of H—Mules and rope; track guage 2b in.

S of M—Hand; 18 Comp. air machines.
PP—5 Return tubular boilers, total 500 H. P., 3 compressors and 3 pumps.
EMP—360. Last fiscal year output 143,480 tons.

FALLEN TIMBER COAL CO.
Colonial Mine No. 1; Drift; E or Up. Freeport Seam, 26 to 38 in. thick
PO—Fallen Timber, Pa.; SP—Same; CTY—Cambria; RR—P. R. R., C. & I. Branch.
PR—W. H. Beers, Fallen Timber, Pa.
GM—W. H. Beers....Fallen Timber, Pa.
TR—B. F. Beers, " " "
GS—Chas. Lamb, " " "
PA—Chas. Lamb, " " "
MS—Geo. Lamb, " " "
EM—W. W. Helman......Coalport, Pa.
SCO—Fallen Timber Supply Co. Buyer J. O. Lovell, Fallen Timber, Pa.
S of H—Mules; track gauge 36 in.
S of M—Hand.
EMP—100. Last fiscal year output 74,876 tons.
Sales Agency, J. Tatnall Lea Co., Philadelphia, Pa.

FALLS CREEK COAL CO.
General Office, Lock Haven, Pa.
Hopkins Mine; Drift; L. Freeport Seam, 5 ft. thick.
PO—Du Bois, Pa.; SP—Same and Falls Creek, Pa.; CTY—Clearfield; RR—P. R. R., B.R. &P.
PR—Wm. P. Hopkins..Lock Haven, Pa.
TR—I. A. Shaffer, Jr., " "
GM—I. A. Shaffer, Jr., " "
PA—I. A. Shaffer, " "
MS—J. R. Axelson......Du Bois, Pa.
EM—V. R. Pratt....Reynoldsville, Pa.
S of H—Rope.
S of M—13 comp. air mach.
PP—2 Erie Water tube boilers, total 300 H. P., 1 comp.
EMP—40. Output 15,000 tons. Mine idle ½ year.
Sales Agent, W. B. Nicol, Prudential Bldg., Buffalo, N. Y.

FANCY HILL COAL WORKS.
Eagle Mine; Drift; Pittsburgh Seam, 72 to 108 in. thick.
PO—Cheat Haven, Pa. SP—Same; CTY—Fayette; RR—B. & O., F. M. & P. Div.
PR—Geo. P. Howell,...Cheat Haven, Pa.
TR—John B. Moore, " "
GM—John B. Moore, " "
PA—John B. Moore, " "
MS—Matthew Lubin, " "
EM—Harry B. Gans....Uniontown, Pa.
SCO—Eagle Supply Co. Buyer, Ray Blosser, Cheat Haven, Pa.
S of H—Mules and 1 gasoline loco. Track gauge 42 in.
S of M—1 elec. mach.
PP—220 volts A. C. Power purchased.
EMP—80. Last fiscal year output 100,000 tons.

FARMERS LIMESTONE, COAL & OIL CO.
Drift Mine.
PO—Parkers Landing, Pa.; SP—Same; CTY—Armstrong; RR—B. & O.
PR—S. M. Turk, Parkers Landing, Pa.
GM—S. M. Turk, " "
TR—C. W. Wick, " "
CE—J. A. Foster, " "

FAY COAL COMPANY
General Office, Grove City, Pa.
Turner Mine; Shaft; Upper Freeport; 36 to 44 in. thick.
PO—Evans City; SP—Same; CTY—Butler; RR—B. & O.
PR—J. M. Martin......Grove City, Pa.
TR—John A. Turner " "
GM—L. B. Gaiser.....Evans City, Pa.
GS—L. B. Gaiser " "
PA—L. B. Gaiser " "
EE—L. C. Sarver " "
S of H—1 elec. loco. Track gauge 40 in.
S of M—2 elec. mach.
PP—1 pump. Purchase power.
Note—Successors to Dixon Coal Co.

FAYETTE COAL CO. (THE)
General Office, Pittsburgh, Pa.
Chalfant Mine, Drift; Pgh. Vein 5ft. thick.
PO—Noblestown, Pa.; SP—Same; CTY—Allegheny.
RR—P. C. C. & St. L.
PR—Henry Chalfant....Pittsburgh, Pa.
TR—D. B. McClelland, " "
GM—A. M. Bell, " "
PA—A. M. Bell, " "
CE—John M. Rayburn, " "
GS—J. E. Kennedy...Noblestown, Pa.
MM—Jos. Venaleck, " "
EE—Joo. Venaleck, " "
SCO—Noblestown Supply Co., Buyer Desire Thomassy, Noblestown, Pa.
S of H—4 Elec.. loco. and mules; track guage 42 in.
S of M—6 Elec. and 18 Comp. air mach. and hand.
PP—5 Return tubular boilers total 750 H. P., 2 air compressors, 2 gen. units 250 volts D. C.
EMP—352.
Sales Agent A. M. Bell, Pittsburgh, Pa.
(Old information.)

FAYETTE COKE CO.
Shamrock Mine, Slope, Pittsburgh Seam, 8 to 11 ft. thick.
PO—New Salem, Pa., SP—Same, CTY—Fayette; RR—M. R. R.
PR—G. P. Fitzgerald..New Salem, Pa.
TR—C. E. Lenhart, " "
GM—C. E. Lenhart, " "
GS—Geo. H. Reynolds..New Salem, Pa.
PA—Geo. H. Reynolds, " "
MM—J. J. Maza, " "
MF—Joshua Shoffur, " "
EE—S. M. Brownfield, " "
SCO—Shamrock Supply Co., " "
Buyer, Bert McBurney, " "
EM—Fayette Engineering Co., Uniontown, Pa.
S of H—Rope, horses and 2 elec. loco., Track gauge 40 in.
S of M—Hand.
PP—5 Return tubular boilers, Erie, total 480 H. P., 3 gen. units, 650 Volts D. C., 1 air comp., 3 pumps. Also buy power.
EMP—205.
Last fiscal year output 176,427. 92 tons.
260 Bee Hive coke ovens.
Sales Agents, Producers Coke Co., Uniontown, Pa.

FERNWOOD COAL CO.
Mt. Vernon No. 10 Mine, Drift, "D" Seam.
PO—Curwensville, Pa.; SP—Fernwood, Pa. CTY—Clearfield; RR—P. S. & N.
PA—M. J. Kelly......Curwensville, Pa.
MS—John R. Farrel, " "
S of H—Mules.
S of M—Hand.
EMP—30

FIGART RUN COAL CO.
Fricks Mine Drift; "B" and "C" Seam, 36 to 72 in. thick.
PO—Blandburg, Pa.; SP—Figart, Pa., CTY—Cambria. RR—P. R. R. Stroud Branch.
TR—R. L. Bower........Blandburg, Pa.
GM—R. L. Bower, " "
PA—R. L. Bower, " "
GS—W. S. McCartney, " "
SM—R. L. Bower, " "
EM—A. Smith, " "
S of H—Mules.
S of M—Hand.
PP—1 pump.
EMP—30. Last fiscal year output 12,000 tons.

FISHER SMOKELESS COAL CO.
Somerset, Pa. No report.

FORD COLLIERIES CO.
PR—J. B. Ford......Detroit, Mich.
TR—E. L. Ford, " "
GM-VP—J. A. Curtis, " "
GS—W. D. Thomas.....Curtisville, Pa.
PA—J. H. Byers, " "
EM—G. G. Long, " "
EE—Richard Shaw, " "
GM OF MINES—A. R. Pollock, Curtisville, Pa.
ASST SUPT—M. D. Cooper, " "
SCO—Isabel Mercantile Co. Buyer, H. D. Bittner, Pittsburgh, Pa.
Sales Agent, J. A. Curtis, V. P. & G. M., Detroit, Mich.

Benjamin Mine; Shaft; Freeport Seam, 60 to 84 in. thick.
PO—Curtisville, Pa., SP—Same CTY—Allegheny. RR—Bessemer & L.E.
MS—Wm. D. Thomas....Curtisville, Pa.
—**S of H**—10 elec. loco. Track gauge 42 inches.
S of M—7 Elec. mach.
PP—6 Erie return tubular boilers, total 1200 H. P., 2 gen. units, 250 volts, D. C., 1 pump.
EMP—350. Last fiscal year output 523,541 tons.

Francis Mine; Shaft; Freeport Seam, 60 to 84 in. thick.
PO—Curtisville, Pa., SP—Same, CTY—Allegheny. RR—Bessemer & L.E.
MS—Wm. D. Thomas....Curtisville, Pa.
S of H—9 elec. loco. Track gauge 42 in
PP—4 Erie return tubular boilers, total
S of M—6 Elec. machines.
800 H. P., 2 gen. units, 250 volts D. C., 1 pump.
EMP—300. Last fiscal year output 430,903 tons.

Berry Mine; Shaft; Freeport Seam, 60 to 84 in. thick.
PO—Bairdford, Pa.; SP Same; CTY—Allegheny; RR—B. & L. E.
MS—W. D. Thomas....Curtisville, Pa.
S of H—4 elec. loco. Track gauge 42 in.
S of M—3 elec. mach.
PP—4 Erie City return tubular boilers, 800 H. P., 2 gen. units, 250 volts D. C., 1 pump.
EMP—170. Last fiscal year output 119,399 tons.

FORGE COAL MINING CO.
General Office, Franklin Bldg., Philadelphia, Pa.
GM—A. M. Riddell .....Portage, Pa.
PA—A. Y. Stevenson.Philadelphia, Pa.
EM—A. B. Crichton ..Johnstown, Pa.
Sales Agent, David E. Williams & Co., Philadelphia, Pa.

Forge No. 1 Mine, Slope, C. Prime Seam.
PO—Portage, Pa. · SP—Same. CTY—Cambria. RR—P. R. R.
MS—Cn. Fahey...........Portage, Pa.
S of H—4 elec. locos.
S of M—15 comp. air mach.
PP—3 return tubular boilers, total 525 H. P., 2 air comp., 2 pumps.
EMP—144. Last fiscal year output 121,239 tons.

Puritan Mine, Shaft, Miller Seam.
PO—Puritan, Pa. SP—Same. CTY—Cambria. RR—P. R. R.
MS—Robert Quigley........Puritan, Pa.
SCO—Excelsior Store Co. SB—Penn Griest, Puritan, Pa.
S of H—1 elec. loco.
S of M—7 comp. air machines.
PP—Power purchased.

EMP—80. Last fiscal year output 54,464 tons.

FRANCIS COAL CO.
General Office, East Palestine, Ohio.
Duff No. 2 Mine, Drift, No. 7 S am, 34 to 36 in. thick.
PO—Cannelton Pa. SP—Same. CTY Beaver, RR—P. L. & W.
TR—M. B. Francis,.. East Palestine, O.
PA—M. B. Francis, " . " "
GM—Thos. G. Francis, " " "
GS—Thos. G. Francis " " "
MS—Thos. G. Francis, " " "
EE—John Lafferty, " " "
S of H—Rope. Track gauge 38 in.
S of M Hand
PP—2 Erie return tubular boilers.
EMP—40. Last fiscal year output 32,000 tons.

FRANKLIN COKE CO.
General Office, Mt. Pleasant, Pa.
Leon Mine; Drift; Connellsville Coking Seam, 8 ft. thick.
PO—Smock, R. F. D., Pa.; SP—Same; CTY—Fayette; RR—P. V. & C., Redstone Branch.
PR—James S. Braddock, Mt. Pleasant, Pa.
GM—James S. Braddock, " "
GS—H. C. Braddock, " "
PA—H. C. Braddock, " "
TR—Dr. G. B. Roberts, Vanderbilt, Pa.
MS—Chas. A. Wilson, ...Smock, Pa.
EM—H. B. Gans,......Uniontown, Pa.
S of H—Mules and 1 Steam loco.; track gauge 40 in.
S of M—Hand.
EMP—30. •30 Bee Hive coke ovens.

FRAZER, WM.
Frazer Mine, Drift; B Seam; 5 . ft. thick.
PO—Laquin, Pa.; SP—Same; CTY—Bradford; RR—S. & N. Y.
PA—F. H. Warriner......Laquin, Pa.
SM—F. H. Warriner, " "
GM—J. H. Frazer......Monroeton, Pa.
GS—J. H. Frazer, " "
MS—C. F. Lyon, " "
EM—C. F. Lyon, " "
MM—E. K. West,.........Laquin, Pa
S of H—Mules. Track gauge 3 ft.
S of M—Hand.
EMP—18. Last fiscal year output 10,995 tons.

FREDERICKTOWN COAL CO.
Fredericktown Mine; Drift; Pittsburgh Seam, 72 to 96 in. thick.
PO—Fredericktown, Pa.; SP—Same; CTY—Washington; RR—P. R. R., P. M. & S. Branch.
PR—Jas. A. Hawkins, Fredericktown, Pa.
TR—W. W. Hawkins, " "
GM—J. A. Baxendell, " "
PA—J. A. Baxendell, " "
MS—Chas. Butler, " "
EM—L. A. Moslener, Brownsville, Pa.
S of H—Mules and rope.
S of M—2 Elec. mach.
PP—Gen. unit 250 volts D.C. Power purchased.
EMP—60. Last fiscal year output 114,000 tons.
Sales Agency, Moreland Coke Co., Pittsburgh, Pa.

FRICK, H. C., COKE CO.
General Office, Carnegie Bldg., Pittsburgh, Pa.
PR—W. H. Clingerman,..Pittsburgh, Pa.
TR—Philip Keller, " "
Secy—D. H. Coble, " "
PA—T. S. Duncan, " "
Auditor—C. P. Parker, " "
GS—Clay F. Lynch......Scottdale, Pa.
GS—Asst, W. H. Glasgow, " "
CE—Asst., T. W. Dawson, " "
Mech. Engr.—G. E. Huttelmaier, Scottdale, Pa.
EE—W. A. Chandler, " "
SCO—Union Supply Co., Buyer, C. L. Steiner, Frick Bldg., Pittsburgh, Pa., Genl. Supt. of Stores, John Lynch, Uniontown, Pa.

Adelaide Mine, Shaft.
PO—Adelaide, Pa. SP—Same. CTY—Fayette. RR—P. & L. E.
MS—R. C. Beerbower, Connellsville, Pa.
S of H—1 steam loco. and mules.

(Continued on Next Page.)

Frick, H. C. Coke Co.—Cont.
S of M—Hand.
PP—6 return tubular boilers, total 525 H. P.
EMP—219.

Alverton Nos. 1, 2 and 3 Mines, Slopes and Drift.
PO—Alverton, Pa. SP—Same. CTY—Westmoreland. RR—P. R. R., Somerville Branch.
MS—S. B. Marton......Alverton, Pa.
S of H—2 steam loco. and mules.
S of M—Hand.
PP—4 Cylindrical and 1 return tubular boilers, total 240 H. P.
EMP—247.

Baggaley Mine, Slope, Pgh. Seam, 7 to 7½ ft. thick.
PO—Baggaley, Pa. SP—Same. CTY—Westmoreland. RR—P. R. R., Unity Branch.
MS—Jos. Ma'ia ....Baggaley, Pa.
S of H—2 comp. air and 2 steam locos.
S of M—3 comp. air mach.
PP—12 return tubular boilers, total 1,670 H. P., 4 comp. and 4 pumps.
EMP—409.

Bitner Mine, Drift.
PO—Dunbar, Pa. , R. F. D. No. 2. SP—Bitner Coke Works, Pa. CTY—Fayette. RR—P. R. R., Monon. Div.
MS—J. H. Pettigrew......Dunbar, Pa.
S of H—2 elec. locos.
S of M—Hand.
PP—2 return tubular boilers, total 300 H. P.
EMP—360.

Bridgeport Mine, Shaft.
PO—Brownsville, Pa. SP—Same. CTY—Fayette. RR—P. R. R., Monon. Div., P. & L. E.
MS—W. C. Hood ....Brownsville, Pa.

Brinkerton Mine, Drift.
PO—Greensburg, Pa., R. F. D. No. 7. SP—Brinkerton, Pa. CTY—Westmoreland. RR—P. R. R.
MS—J. H. Bitz .....Greensburg, Pa.
S of H—1 steam loco. and mules.
S of M—Hand.
PP—5 return tubular boilers, total 280 H. P. and 1 comp.
EMP—166...

Buckeye Mine, Slope.
PO—Stauffer, Pa. SP—Buckeye, Pa. CTY—Westmoreland. RR—P. R. R., B. & O.
MS—J. Q. Finch..........Stauffer, Pa.
S of H—2 steam loco. and mules.
S of M—Hand.
PP—6 Cylindrical and 5 return tubular boilers, total 900 H. P., 6 pumps.
EMP—135.

Buffington Mine, Shaft, Pgh. Seam, 90 to 112 in. thick.
PO—New Salem, Pa.; SP—Same; CTY—Fayette; RR—P. R. R. Monon. Div.
MS—Jas. Hart.......New Salem, Pa.
S of H—Mules.
S of M—6 Comp. air mach.
PP—8 Return tubular boilers, total 1200 H. P., 1 comp., 2 pumps.
EMP—424.

Calumet Mine; Shaft.
PO—Calumet, Pa.; SP—Same; CTY—Westmoreland; RR—P. R. R., Monon. Div.
MS—Robt. Ramsey......Calumet, Pa.
S of H—3 Comp. air and 1 steam locos.
S of M—Hand.
PP—8 Return tubular boilers, total 1060 H. P. and 7 pumps.
EMP—260.

Central Mine; Slope.
PO—Tarr, Pa.; SP—Same; CTY—Westmoreland; RR—P.R.R.
MS—H. G. Brown.........Tarr, Pa.
S of H—1 Steam loco and mules.
S of M—Hand.
PP—10 Return tubular boilers, total 1090 H. P. and 1 comp.
EMP—272. Last fiscal year output 288,254 tons.

Chambers Mine; Drift.
PO—Greensburg. Pa.; R. F. D. No. 5; SP—Margeurite, Pa.; CTY—Westmoreland; RR—P. R. R.
MS—H. B. Cunningham,
R. D. No. 5, Greensburg, Pa.
S of H—Mules.
S of M—Hand.
PP—2 Return tubular boilers total 120 H. P. and 1 pump.

Coal Brook Mine; Slope.
PO—Connellsville, Pa., R.F.D. No. 35; SP— Ruth, Pa.; CTY—Fayette; RR—P. R. R.
MS—R. C. Beerbower..Connellsville, Pa
PP—2 Return tubular boilers, total 150 H. P.
EMP—93.

Collier Mine; Shaft, Pgh. Seam 7 to 7½ ft.
PO—Unionown, Pa., R. F. D., No. 3 SP—Collier, Pa.; CTY—Fayette; RR—P.R.R., B.&O., S.&M.Br.
MS—E. W. Wilkinson, Uniontown, Pa.
S of H—4 Comp. and 2 steam loco.
S of M—6 Comp. air mach.
PP—3 Return tubular boilers, total 750 H. P., 4 comp. and 2 pumps.
EMP—302.

Colonial No. 1 Mine; Slope; Pgh. Seam, 7 to 7½ ft. thick.
PO—Smock, Pa.; SP—Same; CTY—Fayette; RR—P.R.R., Monon Div.
MS—B. J. Murphy.......Smock, Pa.
S of H—2 Elec. loco.
S of M—11 Elec. mach.
PP—4 Return tubular boilers total 600 H. P. and 4 pumps.
EMP—339.

Colonial No. 3 Mine; Shaft; Pgh. Seam, 7 to 7½ ft. thick.
PO—Grindstone, Pa., R.F.D. No. 23; SP—Rowes Run, Pa.; CTY—Fayette; RR—P.R.R., Monon. Div.
MS—W. C. Hood......Grindstone, Pa.
S of M—10 Comp. air mach.
PP—3 Return tubular boilers, total 1500 H. P., 2 comp. and 1 pump.
EMP—233.

Colonial No. 4 Mine; Shaft; Pgh. Seam, 7 to 7½ ft. thick.
PO—Grindstone, Pa.; SP—Same; CTY—Fayette; RR—P.R.R., Monon. Div.
MS—W. C. Hood......Grindstone, Pa.
S of H—2 Elec. loco.
S of M—11 Elec. mach.
PP—5 Return tubular boilers, total 570 H. P. and 2 pumps.
EMP—205. Last fiscal year output 251,164 tons.

Continental No. 1 Mine Shaft.
PO—Uniontown, Pa.; SP—Continental Works No. 1; Pa.; CTY—Fayette; RR—P.R.R., B. & O.
MS—W. C. Mullan....Uniontown, Pa.
PP—9 Return tubular boilers, total 1,240 H.P., 2 comp. and 2 pumps
EMP—340.

Continental No. 2 Mine; Shaft; Pgh Seam, 92 to 108 in. thick.
PO—Uniontown, Pa., R.F.D. No. 3; SP—Walnut Hill, Pa.; CTY—Fayette: RR— P. R. R., B. & O.
MS—R. H. Barry .....Uniontown, Pa.
S of H—3 Comp. air and 1 steam loco.
S of M—8 Comp. air mach.
PP—7 Return tubular boilers, total 490 H. P. and 1 pump.
EMP—279.

Continental No. 3 Mine; Shaft.
PO—Newcomer, Pa.; SP—Same; CTY—Fayette; RR—P.R.R., B. & O.
MS—R. H. Barry......Uniontown, Pa.
S of H—1 Steam loco.
PP—5 Return tubular boilers, 400 H. P.
EMP—253.
274,952 tons.

Crossland Mine; Slope.
PO—Uniontown, Pa.; R.F.D. No. 2; SP—Same; CTY—Fayette; RR—P. R.R., B. & O.
MS—P. J. Locke.......Uniontown, Pa.
PP—2 Return tubular boilers, total 300 H. P., 1 comp.
Davidson Mine; Shaft.
PO—Connellsville, Pa.; SP—Davidson, Pa.; CTY—Fayette; RR—P.R.R., B. & O.
MS—R. C. Beerbower.Connellsville, Pa.
S of H—3 Steam loco.
PP—7 Return tubular boilers, total 1120 H. P., 2 comp. and 7 pumps.
EMP—313.

Dearth Mine; Drift; Pgh. Seam; 7 to 10 ft. thick.
PO—Uniontown, Pa., R.F.D. No. 4; SP—Low Phos, Pa.; RR—P.R.R., Monon. Div.
MS—Jas. Hart........Uniontown, Pa.
S of M—Comp. air and elec. loco.
EMP—250. .

Dorothy Mine; Shaft; Pgh. Seam, 7 to 7½ ft. thick.
PO—Latrobe, Pa.; SP—Dorothy Coke Works, Pa.; CTY—Westmoreland; RR—P. R. R.
MS—A. F. Downing.....Latrobe, Pa.
S of H—1 Steam loco.
S of M—8 Comp. air loco.
PP—6 Return tubular boilers, total 1050 H. P., 2 comp. and 2 pumps.
EMP—220.

Edenborn Mine; Shaft; Pgh. Seam, 79 to 87 in. thick.
PO—Edenborn, Pa.; SP—Same; CTY—Fayette; RR—P. R. R., Monon. Div.
MS—J. F. McCrackin....Edenborn, Pa.
S of H—2 Steam loco.
S of M—10 comp. air mach.
PP—12 Return tubular boilers, total 1850 H. P., 3 comp. and 1 pump.
EMP—534.

Enterprise Mine; Drift.
PO—Alverton, Pa.; SP—Enterprise Coke Works, Pa.; CTY—Westmoreland; RR—P. R. R.
Not operating.

Filbert Mine.
PO—New Salem, Pa., R.F.D. No. 18; SP—Fairbank, Pa. CTY—Fayette, RR—P.R.R. Monon. Div.
MS—H. N. Boyd......New Salem, Pa.
S of H—Mules.
S of M—Hand.
EMP—150.

Footedale Mine, Drift and Slope, Pgh. Seam; 7 to 9 ft. thick.
PO—Uniontown, Pa., R. F. D., No. 4; SP—Same; CTY—Fayette; RR—P. R. R., Monon. Div.
MS—R. S. Skemp....New Salem, Pa.
S of H—3 Elec. loco.
S of M—4 Elec. and 1 comp. air mach.
PP—5 Return tubular boilers, total 750 H. P., 2 comp. and 2 pumps.
EMP—347.

Gates Mine; Shafts; Pgh. Seam; 88 to 108 in. thick.
PO—Adah, Pa. SP—Gates, Pa.; CTY—Fayette; RR—P. R. R., Monon. Div.
MS—H. N. Boyd..........Adah, Pa.
S of M—12 Comp. air mach.
PP—12 Return tubular boilers, total 1870 H. P., 4 comp. and 2 pumps.
EMP—253.

Hecla Nos. 1 and 3 Mines; Shafts.
PO—Smith West, Pa.; SP— Hecla, Pa.; CTY—Westmoreland; RR—P. R. R.
MS—A. H. Pollins....South West, Pa.
S of H—1 Steam loco. (at No. 3).
PP—14 Return tubular boilers, total 2820 H. P., 3 compressors and 9 pumps.
EMP—514.

Hecla No. 2 Mine; Shaft.
PO—Trauger, Pa.; SP—Same; CTY—Westmoreland; RR—P. R. R.
MS—Rober Ramsay........Trauger, Pa.
S of H—1 steam loco.
PP—8 Return tubular boilers, total 1100 H. P., 2 comp. and 5 pumps.
EMP—281.

Hopwood Mine.
PO—Uniontown, Pa.; SP—Hopwood, Pa.: CTY—Fayette; RR—B. & O.
Not operating.

Juniata Mine, Shaft.
PO—Dunbar, Pa., R.F.D. No. 32; SP—Juniata, Pa.; CTY—Fayette; RR—B. & O., and O. & B. Short Line Branch.
MS—R. V. Rex..........Dunbar, Pa.
S of H—1 Steam loco.
PP—6 Return tubular boilers, total 650 H. P., and 3 pumps.
EMP—247.

Kyle Mine, Drift; Pgh. Seam, 6 to 9 ft. thick.
PO—Fairchance, Pa.; SP—Same; CTY—Fayette; RR—P. R. R.
MS—G. H. Hodges.....Fairchance, Pa.
S of H—4 Elec. loco.
S of M—2 Elec. mach.
EMP—285.

Lambert Mine; Shaft; Pgh. Seam, 88 to 198 in. thick.
PO—Lamberton, Pa. SP—Same CTY—Fayette; RR—P.R.R., Monon.Div.
MS—H. N. Boyd,....Lamberton, Pa.
S of H—3 Comp. air loco.
S of M—7 Comp. air mach.
PP—6 Return tubular boilers, total 1500 H. P., 3 comp. and 1 pump.
EMP—411.

Leckrone Mines; Drift and Slope; Pgh. Seam.
PO—Leckrone, Pa.; SP—Same; CTY—Fayette. RR—P.R.R., Monon., B. & O.
MS—J. A. Ramsay .... Leckrone, Pa.
S of H—9 elec. loco.
S of M—7 Elec. mach.
PP—6 Return tubular boilers, total 900 H. P.
EMP—341.

Leisenring No. 1 Mine; Shaft.
PO—Leisenring, Pa.; SP—Same; CTY—Fayette; RR—P.R.R., B. & O.
MS—C. B. Franks....Leisenring, Pa.
S of H—4 Comp. air and 1 steam loco.
PP—12 Return tubular boilers, total 1400 H. P., 3 comp. and 4 pumps
EMP—418.

Leisenring No. 2 Mine Shaft.
PO—West Leisenring, Pa.; SP—Bute, Pa.; CTY—Fayette; RR—P.R.R.
MS—R. K. Warnock, West Leisenring, Pa.
S of H—2 Steam loco.
PP—3 Cylindrical and 4 return tubular boilers, total 935 H. P., 1 comp. and 2 pumps.
EMP—518.

Leisenring No. 3 Mine, Shaft.
PO—Dunbar, Pa., R.F.D. No. 32; SP—Monarch, Pa.; CTY—Fayette; RR—P. R. R.
MS—R. V. Rex........Dunbar, Pa.
S of H—4 Comp. air and 2 steam loco.
PP—7 Boilers, total 1650 H. P., 3 comp. and 2 pumps.
EMP—467.

Leith Mines; Shaft.
PO—Uniontown, Pa.; SP—Leith, Pa.; CTY—Fayette RR—P.R.R., B.&O.
MS—P. J. Locke.....Uniontown, Pa.
S of H—Steam loco.
PP—11 Return tubular boilers, total 1600 H. P., 2 comp. and 9 pumps.
EMP—291.

Lemont Nos. 1 and 2 Mines; Slope.
PO—Lemont Furnace, Pa.; SP—Lemont Ovens and Darent, Pa.; CTY—Fayette; RR— B. & O., P.R.R.
MS—T. L. Doorley, Lemont Furnace, Pa.
S of H—2 Elec. and 1 steam loco.
S of M—Comp. air mach and hand.
PP—24 Return tubular boilers, total 12,560 H. P., 2 comp. and 4 pumps.
EMP—634.

Mammoth Mine; Shaft.
PO—Mammoth, Pa.; SP—Same; CTY—Westmoreland; RR—P. R. R.
MS—F. K. Drill.....Mammoth, Pa.
S of H—2 Comp. air and 1 steam loco.
S of M—Comp. air mach. and hand.
PP—10 Return tubular boilers, total 1480 H. P., 3 comp. and 7 pumps.
EMP—400.

Marguerite Mine; Slope; Pgh. Seam, 84 to 102 in. thick.
PO—Greensburg, Pa., R.F.D. No. 5 SP—Margeurite, Pa.; CTY—Westmoreland; RR—P.R.R.
MS—H. B. Cunningham,
R. D. No. 5 Greensburg, Pa.
S of H—1 Steam loco.
S of M—10 Comp. air mach.
PP—8 Return tubular boilers, total 1850 H. P., 3 comp. and 3 pumps.
EMP—340.

Monastery Mine, Slope.
PO—Latrobe, Pa.; SP—Monastery Coke Works, Pa.; CTY—Westmoreland; RR—P. R. R.
MS—A. F. Downing.......Latrobe, Pa.
PP—3 Return tubular boilers, total 400 H. P., and 2 pumps.

Mutual Mine; Slope.
PO—United, Pa.; SP—Mutual, Pa.; CTY—Westmoreland; RR—P. R. R.
MS—Robert Ramsey........United, Pa.
S of H—1 Steam loco.
PP—4 Return tubular boilers, total 320 H. P., 1 comp. and 2 pumps.
EMP—126.

Oliphant Mine; Slope.
PO—Oliphant Furnace, Pa.; SP—Same; CTY—Fayette; RR—P.R.R.
MS—T.W.English, Oliphant Furnace,Pa.
S of M—Comp. air mach. and hand.
PP—4 Return tubular boilers, total 600 H. P. and 2 comp.
EMP—262.

Painter Mine, Drift.
PO—Scottdale, Pa.; SP—McClure, Pa.; CTY—Fayette; RR—B. & O.
Not operating.

Phillips Mine; Shaft; Pgh. Seam, 8 to 9 ft. thick.
PO—Uniontown, Pa., R.F.D. No. 1; SP—Phillips Mine, Pa.; CTY—Fayette; RR—P.R.R., Monon.Div.
MS—W. J. Culleton..Uniontown, Pa.
S of H—3 Comp. air loco.
S of M—14 comp. air mach.
PP—4 Return tubular boilers, total 1200 H. P., 3 comp. and 1 pump.
EMP—314.

Ralph Mine, Shaft.
PO—McClellandtown, Pa., R.F.D. No. 17; SP—Ralph, Pa.; CTY—Fayette; RR—P.R.R. Monon. Div.

Redstone Mine; Shaft and Slope.
PO—Brownfield, Pa.; SP—Same; CTY—Fayette; RR—B. & O.
MS—Herbert Boyd.....Brownfield, Pa.
S of H—2 Comp. air and 1 steam loco.
PP—8 Return tubular boilers, total 240 H. P., 1 comp. and 4 pumps.
EMP—414.

Rist Mine; Slope.
PO—Broad Ford, Pa.; SP—Same; **CTY**—Fayette; RR—B. & O.
MS—James Lynch......Broad Ford, Pa.
S of H—1 Steam loco and mules.
PP—4 Cylindrical boilers, total 140 H. P.
EMP—101.

Ronco Mine; Shaft; Pgh. Seam, 7½ to 8 ft. thick.
PO—Ronco, Pa.; SP—Same; CTY—Fayette; RR—P. R. R. Monon. Div.
MS—C. F. McCrackin......Ronco, Pa.
S of H—4 Comp. air loco.
S of M—11 Comp. air mach.
PP—7 Return tubular boilers total 2100 H. P., 5 comp. and 2 pumps.
EMP—268.

Sarah Mine.
PO—East Millsboro, Pa., R.F.D. No. 21; SP—Sarah, Pa.; CTY—Fayette; RR—P.R.R., Monon. Div., P. & L. E.
Not operating.

Shoaf Mine, Drift, Pgh. Seam, 90 to 114 in. thick
PO—Smithfield, Pa., R.F.D. No. 7; SP—Shoaf, Pa.; CTY—B. & O., S. & M. Br., P. R. R.
MS—Frank Emory.....Smithfield, Pa.
S of H—3 Elec. loco.
EMP—449.

South West No. 1 Mine; Shaft.
PO—Mt. Pleasant, Pa.; SP—Morewood Coke Works, Pa.; CTY—Westmoreland; RR—P.R.R.
MS—J. A. Cowan..Mt. Pleasant, Pa.
S of H—4 Steam loco. and mules.
PP—17 Return tubular boilers, total 2050 H. P., 3 comp. and 7 pumps.
EMP—439.

South West No. 2 Mine; Slope.
PO—Mt. Pleasant, Pa.; SP—Alice Mines, Pa.; CTY—Westmoreland; RR—P. R. R.
MS—J. Q. Finch....Mt. Pleasant, Pa.
PP—5 Return tubular boilers, total 450 H. P., and 4 pumps.
EMP—112. Last fiscal year output 121,145 tons.

South West Nos. 3and 4 Mines; Slipes.
PO—Tarr, Pa.; SP—Same; CTY—Westmoreland; RR—P. R. R.
MS—Burgess B. Boyd......Tarr, Pa.
PP—6 Cylindrical and 2 return tubular boilers, total 520 H. P., 3 pumps.
EMP—196.

Standard Mine; Shaft.
PO—Mt. Pleasant, Pa.; SP—Standard, Pa.; CTY—Westmoreland; RR—B. & O.
MS—J. S. Mack......Mt. Pleasant, Pa.
S of H—5 Steam loco. and mules.
PP—17 Boilers, total 2915 H. P., 3 comp. and 10 pumps.
EMP—882.

Trotter Mine, Shaft.
PO—Connellsville, Pa.; SP—Trotter, Pa.; CTY—P.R.R., B. & O.
MS—Benton Boyd....Connellsville, Pa.
S of H—3 Comp. air loco.
PP—7 Return tubular boilers, total 1400 H. P., 3 comp. and 5 pumps.
EMP—396.

United Mine; Shaft.
PO—United, Pa.; SP—Same; CTY—Westmoreland; RR—P. R. R.
MS—Robert Ramsay......United, Pa.
S of H—2 Comp. air and 1 steam loco.
PP—1 Cylindrical and 8 return tubular boilers, total 1230 H. P., 3 comp. and 5 pumps.
EMP—340.

White Mine; Drift.
PO—Broad Ford, Pa.; SP—Sherrick, Pa. CTY—Fayette. RR—B. & O.
MS—James Lynch......Scottdale, Pa.
PP—1 Return tubular boiler, total H. P.
EMP—107.

Wynn Mine.
PO—Fairchance, Pa.; SP—Wynn Works, Pa.; CTY—Fayette; RR—P.R.R.
MS—T. W. English....Fairchance, Pa.
EMP—260.

York Run Mine; Drift and Slope; Pgh. Seam, 6 to 7½ ft. thick.
PO—Uniontown, Pa., R. F. D., No. 3. SP—York Run, Pa.; CTY—P.R.R.
MS—S. W. Brown
R. F. D. No. 3, Uniontown, Pa.
S of H—5 Elec. loco.
PP—6 Return tubular boilers, to' 1800 H. P., 2 comp. and 4 pumps.
EMP—429.

Youghiogheny Mine.
PO—Suterville, Pa.; SP—Douglass Station, Pa.; CTY—Allegheny; RR—P. & L. E.
MS—L. E. Osborne....Suterville, Pa.

Youngstown Mine; Slope.
PO—Lemont Furnace, Pa. SP—Stambaugh, Pa.; CTY—Fayette; RR—P. R. R., B. & O.
MS—T. L. Dooley, Lemont Furnace, Pa.
S of H—1 Steam loco. and mules.
S of M—Comp. air mach and hand.
PP—8 Return tubular boilers, total 1000 H. P., 3 comp. and 2 pumps.
EMP—226.
Note—Chambers, Crossland, Hopwood, Monastery, Painter, Ralph and Sarah Mines not operating. Valley and Sterling Mines abandoned.

GALLAGHER, W. R. & BRO.
Black Oak Mine, Drift, Miller Seam.
PO—Smith Mill, Pa.; CTY—Clearfield. RR—P. R. R.
MS—John Gallagher....Smith Mill, Pa.
S of H—Mules.
S of M—Hand.
EMP—45. Last fiscal year output 38,000 tons.

GARRETT SMOKELESS COAL CO.
South Side Mine; Slope; C Prime & D Seams; 42 in. thick.
PO—Garrett, Pa.; SP—Same; CTY—Somerset; RR—B. & O. R. R.
PR—V. L. P. Shriver ....Garrett, Pa.
TR—Wm. G. Hocking " "
SECY—Donald G. Keeble, " "
GM—J. Allen Hocking " "
GS—Wm. G. Hocking " "
MS—Wm. T. Hocking, " "
PA—Wm. G. Hocking " "
EM—Fluck & Long. " "
S of H—Mules and rope. Track gauge 36 in.
S of M—Hand.
PP—1 boiler, 100 H. P., 2 pumps. Purchase power.
EMP—50. Last fiscal year output 45. 000 tons.
Successor to Garrett Coal Co.

GATEHOUSE & SHEFF COAL CO.
Port No. 1 Mine, Drift; B Seam 3 1-2 to 4 1-2 ft. thick.
PO—Madera, Pa.; SP—Same; CTY—Clearfield.
RR—N.Y.C.& H.R.; Clearfield & Southern Branch.
PR—J. C. Gatehouse....Madera, Pa.
GM—J. C. Gatehouse, " "
PA—J. C. Gatehouse, " "
MS—J. C. Gatehouse, " "
EM—P. E. Womelsdorff.
S of H—Mules; Track Gauge 3 ft.
EMP—53; Last fiscal year output 25,000 tons.

GENUINE CONNELLSVILLE COKE CO.
General Office, Waltersburg, Pa.
Park Hill Mine, Drift; Connellsville Seam; 8 to 10 ft. thick.
PO—Waltersburg, Pa.; SP—Same; CTY—Fayette. RR—P. R. R. & P. V. & C.
PR—I. W. Seman......Uniontown, Pa.
TR—John E. Hess, " "
GM—M. F. Pickard..Connellsville, Pa.
GS—M. F. Pickard, " "
PA—M. F. Pickard, " "
MS—M. F. Pickard, " "
S of H—Horses and 1 steam loco. Track gauge 44 in.
S of M—Hand.
EMP—56. Coke ovens—58 Bee Hive. Last fiscal year output 25,,309.60 tons.

GHEM COAL CO.
Ghem Mine; Drift Mine; "B" Seam 5ft 6 in. to 5ft. thick.
PO—Osceola Mills, Pa., SP—Same; CTY—Clearfield. RR—P. R. R.; Tyrone & Clearfield Div.
PR—G. M. H. Good, Osceola Mills, Pa.
TR—Chas. R. Houtz, Osceola Mills, Pa.
EM—Womelsdorf & Duncle, Philipsburg. Pa.
S of H—Mules; track gauge 3 ft.
S of M—Hand.

GILLESPIE COAL CO.
Drift Mine; Pittsburgh or River Bank Seam, 84 in. thick.
PO—Fayette City, Pa.; SP—Same; CTY—Fayette; RR—P. & L. E.
PR—Wm.H.Renstrom. Fayette City, Pa.
CE—Wm. H. Penstum, " "
TR—Guy W. Brown.
GM—F. R. Knight...Belle Vernon, Pa.
MS—F. R. Knight, " "
PA—F. R. Knight, " "
S of H—Mules.
S of M—Hand.
NOTE—Just commenced development.

GILMORE COKE OVENS.
General Office, Uniontown, Pa.
TR—R. V. Austin....Uniontown, Pa.
GM—G. B. Gilmore, " "
SCO—Swaney & Gilmore, Buyer, G.B. Gilmore, Uniontown, Pa.

Plumer Mine; Slope; Connellsville Seam 7 ft. thick.
PO—Leckrone, Pa.; SP—Same; CTY—Fayette; RR—B. & O.
MS—Ed Ebberly........Leckrone, Pa
S of H—Rope; mules, track gauge 42 in.
EMP—150. Coke ovens, 72 Bee Hive.

Gilmore Mine; Drift; Connellsville Seam; 7 ft. thick.
PO—Smiley, Pa.; SP—Smiley, Pa.; CTY—Fayette. RR—B. & O.
S of H—1 Elec. loco, track gauge 42 in.
S of M—Hand.
EMP—250. Coke ovens, 101 Bee Hive. (Old information.)

GILPIN COAL CO.
Gilpin Mine, Drift.
PO—Leechburg, Pa.; SP—Same; CTY—Armstrong; RR—P. R. R.
GM—L. W. Hicks.....Leechburg, Pa.
MS—Wm. Gilson, " "
EM—E. A. Watters, " "
S of H—Mules.
S of M—Hand.
PP—1 Return tubular boiler, total 60 H. P., 1 pump.
Black Diamond and Henderson
EMP—61. Last fiscal year output 37,237 tons.

GLEN WHITE COAL & LUMBER CO.
Baltimore, Md.
Glen White No. 2 Mine; Drift; E. or Lemon Seam, 46 to 52 in. thick.
PO—Glen White, Pa.; SP—Kittanning Point, Pa.; CTY—Blair; RR—P. R. R.
PR—Frank J. Taylor...Baltimore, Md.
TR—William Engle, " "
GM—Frank J. Taylor, " "
PA—F. D. McNellis.....Gallitzin, Pa.
GS—F. D. McNellis, " "
MS—F. D. McNellis, " "
EM—J. S. Sillyman & Co., Altoona, Pa.
CE—Henry Fisher.......Gallitzin, Pa.
MM—William Bender...Glen White, Pa.
SCO—Address the Company. Buyer, Gust Helsing, Glen White, Pa.
S of H—Mules, rope, Comp. air and 2 steam locos.
S of M—Hand and 4 comp. air mach.
PP—2 water tube, 2 return tubular boilers, total 250 H. P., 1 air comp.
EMP—200. Last fiscal year output 83,290 tons.
Coke ovens, 96 Bee Hive.

GLENVIEW COAL CO.
Osceola Mills, Pa. No report.

GLENWOOD COAL CO.
General Office, ... Philadelphia, Pa.
Glenwood Coal Co. Mine, Drift C. Prime Seam, 6 to 4½ ft. thick.
PO—Glen Campbell. SP—Glen Campbell, Pa. CTY—Indiana. RR—P. R. R.
PR—David E. Williams Philadelphia, Pa.
TR—William A. Smith, " "
PA—A. Y. Stevenson, " "
GM—A. M. Riddell, Altoona, Pa.
EM—A. B. Critchon,....Johnsown, Pa.
MS—Jas. Bowers, Glen Campbell, Pa.
S of H—1 Elec. loco. Track gauge 3 ft.
S of M—Hand.
PP—2 Erie return tubular boilers, total 300 H. P. 2 Gen. units, 250 volts D.C.
EMP—88. Last fiscal year output 29,000 tons.
Sales Agent, David E. Williams, Phila., Pa.

GOFF-KIRBY COAL CO., THE
General Office, Cleveland, O.
Bessemer and Cannel Mines, Drift.
PO—Deegan, Pa. CTY—Butler. RR—B. & L. E.
PR—I. C. Goff........Cleveland, O.
TR—B. R. Taylor, " "
PA—B. R. Taylor, " "
MS—Jas. A. Gould........Deegan, Pa.
S of H—Mules, rope, and elec loco.
S of M—Hand and elec. mach.

GOOD CLAY & COAL CO.
General Office, Patton, Pa.
Bloomington A 22 Mine; Drift; Moshannon Seam, 30 to 42 in. thick.
PO—Bells Landing, Pa.; SP—Bells, Pa.; CTY—Clearfield; RR—N. Y. C., D. & C. T. Br.
PR—Geo. S. Good, Jr.....Patton, Pa.
GM—Geo. E. Prindible, " "
GS—Geo. E. Prindible, " "
TR—Geo. E. Metzger..St. Benedict, Pa.
PA—Geo. E. Metzger, " " "
MS—B. R. Spackman,
Bells Landing, Pa.
EM—E. W. Hess......Clearfield, "
S of H—Mules.
S of M—Hand.
EMP—52. Last fiscal year output 26,000 tons.
Sales Mgr., Geo. E. Metzger, St. Benedict, Pa.

GOODYEAR, E. J.
Goodyear No. 1 Mine; Drift; "B" Seam, 40 to 44 in. thick.
PO—Winburne, Pa.; SP—Same; CTY—Clearfield; RR—N. Y. C.
GM—E. J. Goodyear......Munson, Pa.
GS—E. J. Goodyear, " "
PA—E. J. Goodyear, " "
SM—T. R. Goodyear, " "
EM—Harry Reese......Kylertown, Pa
S of H—1 elec. loco.
S of M—Hand.
PP—Power purchased, 2 pumps.
EMP—105. Last fiscal year output 52,145 tons.
Sales Agency, J. C. Mox & Co., Utica, N. Y.

GORMAN, F. A.
Gorman No. 3 Mine; Drift B or Miller Seam 48 to 60 in. thick.
PO—R. F. D. No. 3, Patton, Pa; SP—Dougherty Pa CTY—Cambria; RR—Altoona Northern
PR—F. A. Gorman, R. F. D. No. 3, Patton, Pa.
GM—F. A. Gorman, R. F. D. No. 3, Patton, Pa.
PA—F. A. Gorman, R. F. D. No. 3,
MS—F. A. Gorman, R. F. D. No. 3, Patton, Pa.
EM—Fetterman Eng. Co.
S of H—Mules.
S of M—Hand.
EMP—26. Last fiscal year output, 15,583 tons.

GOSHEN COAL CO.
General Office, Clearfield, Pa.
Goshen Nos. 1 and 2; Drift; "E" and "D" Seam 5 to 3 ft. thick;
PO—Surveyor, Pa.; SP—Same; CTY—Clearfield. RR—N.Y.C.& H.R.
PR—Fred G. Betts....Clearfield, Pa.
GM—Fred G. Betts, " "
PA—Fred G. Betts, " "
TR—Alfred Graham, " "
GS—Thomas Langford...Surveyor, Pa
SCO—Surveyor Supply Co., Buyer K. A. Miller, Surveyor, Pa.
S of H—1 Elec. loco.; track gauge 3 ft.
S of M—Hand.
PP—Power Purchased.
EMP—100. Last fiscal year output 100,000 tons.

GOULD, W. A. & BRO.
Midvale Nos. 1, 3 and 4 Loraine Henderson & Black Diamond Mines; Drifts and Slopes; Moshannon and B Seams.
PO—Brisbin, Pa.; SP—Same. CTY—Clearfield; RR—P. R. R.
GM—W. A. Gould.......Brisbin, Pa.
PA—T. V. Gould, " "
MS—John Gould, " "
SM—T. V. Gould, " "
S of H—Rope and mules.
S of M—Comp. air mach.
PP—Boiler, 125 H. P.
EMP—150.

GRACE COAL MINING CO.
Grace No. 1 Mine; Drift, No. A Seam, 48 to 60 in. thick.
PO—Osceola Mills, Pa.; SP—Same; CTY—Clearfield; RR—P. R. R.
PR—S. B. Isenberg....Osceola Mills, Pa.
GM—S. B. Isenberg, " "
PA—S. B. Isenberg, " "
MS—S. B. Isenberg, " "
TR—Geo. Minns, " "
S of H—Rope and mules; track gauge 42 in.
S of M—Hand.
EMP—50.

GRACETON COKE CO.
Mines Nos. 2 and 3, Drifts, Upper Freeport Seam, 5 ft. thick.
PO—Graceton, Pa., SP—Same, CTY—Indiana. RR—Penna. R.R., Indiana Branch.
PR—E. L. Ford......Youngstown, O.
TR—John Stambaugh, " "
GM C. M. Lingle,....Graceton, Pa.
GS—C. M. Lingle........Graceton, Pa.
PA—C. M. Lingle, " "
EM—M. F. Brandon, Homer City, Pa.
CE—W. O. White, Uniontown, Pa.
MM—O. Gibboney........Graceton, Pa.
MS—W. H. Gates, " "
EE—Randolph & Means, Pittsburgh, Pa.
SCO—Graceton Supply Co. Buyer, A. S. Fulmer, Graceton, Pa.
S of H—Rope, mules, 2 elec. and 1 steam loco. Track gauge 42 in.
S of M—Hand, 2 elec. and 38 comp. air mach.
PP—14 return tubular boilers, total 1780 H. P., 2 gen. units, 250 volts A. C., 3 comp., 2 pumps.
EMP—305. Last fiscal year output 200,000 tons.
Coke ovens, 202 Bee Hive.

GRAFF COAL COMPANY.
General Office, Blairsville, Pa.
Graff Mine, Drift; Pittsburgh Seam; 5 ft. 9 in. to 7½ ft. thick.
PO—Blacklick, Pa.; SP—Same; CTY—Indiana. RR—P. R. R., Conemaugh Div., Indiana Branch
PR—W. P. Graff......Blairsville, Pa.
TR—W. P. Graff, " "
GM—F. M. Graff, " "
PA—F. M. Graff. " "
MS—Earnest Fletcher....Saltsburg, Pa.
CE—Albert Smith......Saltsburg, Pa.
S of H—Mules and 2 elec. loco., track gauge 42 in.
S of M—Hand.
PP—1 Erie City return tubular boilers total 150 H. P., 1 gen. unit, 100 K. W., 250 volts D. C.
EMP—75. Last fiscal year output 21,400 tons.
Sales Agent, Knickerbocker Fuel Co., New York, N. Y.

GRAMPIAN COAL MINING CO.
General Office, Clearfield, Pa.
Penn Nos. 4, 5, and Decatur No. 11 Mines, Drifts, Miller Seam, 3½ ft. and 5 ft. thick. Decatur 4 ft. thick.
PO—Osceola Mills, Pa.; CTY—Centre; RR—P. R. R., Tyrone Br.
GS—A. K. Wright....Clearfield, Pa.
S of H—Mule, rope and 3 Elec. loco.
S of M—Elec. mach.

GRASS FLAT COAL CO.
PO—Clearfield, Pa.
PR—H. A. Murray, Clearfield, Pa.
TR—J. P. O'Laughlin, " "

GRASSY RUN COAL CO.
PR—J. Howard Meagher—Elk Lick, Pa.
TR—J. Howard Meagher, " "
GM—J. Howard Meagher, " "
GS—J. Howard Meagher, " "
PA—J. Howard Meagher, " "
SM—George James, " "
EM—B. J. Lynch......Meyersdale, Pa.
MM—I. Wectinzer, " "
SCO—Howard, Meager & Co. Buyer, George James, Elk Lick, Pa.

Grassy Run No. 1 Mine; Drift; Pgh. No 1 Seam, 56 in. thick.
PO—Elk Lick, Pa.; SP—West Salisbury, Pa.; CTY—Somerset;; RR—B. & O.
MS—Archie Cochrane....Elk Lick, Pa.
S of H—1 Steam loco.; track gauge, 42 in.
S of M—Hand.
EMP—43. Last fiscal year output 34,437 tons.

Grassy Run No. 2 Mine, Drift, Redstone seam, 56 in. thick.
PO—Elk Lick, Pa.; SP—West Salisbury, Pa.; CYT—Somerset; RR—B. & O.
MS—P. M. Connor....Elk Lick, Pa.
S of H—Mules.
S of M—Hand.
EMP—77. Last fiscal year output 65,125 tons.

Grassy Run No. 3 Mine, Drift, Redstone Seam, 56 in. thick.
PO—Elk Lick, Pa.; SP—W. Salisbury, Pa.; CTY—Somerset; RR—B. & O.
MS—Jonathan Meager....Myersdale, Pa.
S of H—Mules.
S of M—Hand.
EMP—55. Last fiscal year output 55,226 tons.

GRAZIER COAL MINING CO.
General Office, Johnstown, Pa.
Drift Mine; Cement and Miller Seams. 42 to 56 in. thick.
PO—Hollsopple, Pa.; SP—Foustwell, Pa. CTY—Somerset; RR—B. & O., S. & C. Br.
PR—A. W. Hilderbrand, New York, N. Y.
TR—J. C. Cosgrove.....Johnstown, Pa.
GM—J. C. Crosgrove, " "
PA—J. C. Cosgrove, " "
EM—S. E. Dickey & Co., " "
EE—L. O. Greeg.........Windber, Pa.
MS—E. O. Cramer, R.F.D.,Hollsopple,Pa.
SCO—Grazier Supply Co., " "
S of H—2 Elec loco., mules, rope and gravity; track gauge 36 in.
S of M—2 Elec. and 5 Comp. air mach.
PP—1 Return tubular boiler, 100 H. P., 1 gen. unit 250 volts D. C., 1 compressor, 3 pumps. Purchase power.
EMP—150. Last fiscal year output 120,000 tons.
Successors to Somerset and Cambria Coal Co.

GREENSBURG COAL CO.
Hawksworth Mine, Shaft, Pittsburgh Seam 7 ft. thick.
PO—Greensburg, Pa.; SP—Same. CTY—Westmoreland; RR—P.R.R.
PR—W. A. Coulter.....Greensburg, Pa.
TR—H. W. Coulter.....Greensburg, Pa.
GS—Jos. D. Wentling, " "
PA—Stanley E. Cook, " "
EM—F. E. Maddocks, " "
MM—O. N. Johnson, " "
CE—Geo. S. Baton & Co., Pittsburgh,Pa
EE—Randolph-Means Co., " "
S of H—11 elec. loco. Track gauge 40 in.
S of M—10 elec. mach.
PP—4 pumps. Purchase power.
EMP—250. Last fiscal year output 331,852 tons.
Sales Agents, Greensburg Coal & Coke Co., 518 Commercial Trust Bldg., Philadelphia, Pa.

GREENSBURG-CONNELLSVILLE COAL & COKE CO.
Old Colony Nos. 1 and 2 Mine, Drift, Pittsburgh Seam, 8 ft. thick.
PO—Ligonier, Pa.; SP—North Ligonier, Pa.; CTY—Westmoreland; RR—Ligonier Valley, Wilpen Br.
PR—J. B. L. Hornberger, Pittsburgh, Pa.
TR—Geo. S. Baton, " "
CE—Geo. S. Baton, " "
GM—W. A. Perry.........Ligonier, Pa.
PA—W. A. Perry, " "
MS—John R. Beatty.....Ligonier, Pa.
SCO—Ligonier Valley Supply Co., Buyer W. E. Gehres, Ligonier, Pa.
S of H—1 Gasoline loco. and mules.
S of M—Hand.
EMP—225. Last fiscal year output 188,620 tons. Coke ovens, 128 Bee Hive.

GREENWICH COAL & COKE CO.
See Tunnel Coaling Co.

GROVE CITY COAL MINING CO.
Out of business. Plant dismantled.

GUION COAL CO.
Guion Mine.
PO—Philipsburg, Pa.; SP—Same; CTY—Centre.
GM—J. Guion......Phillipsburg, Pa.
PP—2 Return tubular boilers, total 180 H. P., 1 air comp., 1 pump.
State report.

HADDON COAL CO.
Haddon Mine, Drift
PO—Leechburg, Pa.; SP—Same; CTY—Armstrong; RR—West Penn.
GM—L. W. Hicks......Leechburg, Pa.
PA—L. W. Hicks, " "
MS—Wm. Gilson, " "
EM—E. A. Watters, " "
S of H—Mules.
S of M—Hand.
EMP—69. Last fiscal year output 49,253 tons.

HALE COAL CO.
Hale Mine; Drift; B Seam.
PO—Houtzdale, Pa.; CTY—Clearfield; RR—P. R. R.
PR—James N. Steinman, Lancaster, Pa.
TR—John F. Steinman, " "
GM—Harry Boulton, .. Houtzdale, Pa.
S of H—Elec. loco.
PP—Buy power.

HAMMILL, B. S. COAL COMPANY.
General office, 926 Park Building, Pittsburg Pa.
Hammill Mine; Drift Pittburgh Seam; 48 to 72 in. thick.
PO—Bunola, Pa; SP—Same; CTY—Allegheny RR—P. & L. E.
PR—A. R. Hamilton, ..Pittburgh, Pa.
TR—A. R. Hamilton, " "
GS—M. C. Herron, " "
MS—M. C. Herron, " "
PA—W. P. Anderon, " "
S of H—1 elec. loco.
S of M—1 elec. mach.
PP—Purchase power.
EMP—70.

HAMILTON COAL CO.
General Office, Punxsutawney, Pa.
Hamilton No. 1 Mine; Drift; Lower Freeport Seam, 44 to 52 in. thick.
PO—Hamilton, Pa.; SP—Same; RR—B. R. & P.
PR—H. G. Bowers....Punxsutawney, Pa.
GM—H. G. Bowers, " "
PA—H. G. Bowers, " "
TR—G. E. Hagstrom, " "
GS—Ed. Carlson, " "
MS—Ed. Carlson " "
EM—Harry Knarr, " "
S of H—Mules.
S of M—Hand.
EMP—20. Last fiscal year output 16,043 tons.

Hamilton No. 2 Mine; Drift; Lower Freeport; 58 to 60 in. thick.
PO—Anita; SP—Same; CTY—Jefferson; RR—P. R. R.
MS—Ed. Carlson....Punxsutawney, Pa.
S of H—Mules.
S of M—Hand.
EMP—25. Last fiscal year output 22,815 tons.

HAMILTON, S. M. & CO.
General Office, Marine Bank Building, Baltimore, Md.
Adams Mine, Drift, Upper Kittanning or "C" Prime Seams, 36 to 48 in. thick.
PO—Wellscreek, Pa.; SP—Adams, Pa.; CTY—Somerset; RR—B. & O., Somerset & Cambria Branch.
PR—Howard Adams ....Baltimore, Md.
TR—Irving Adams, " "
GS—Phil. A. Shaffer......Somerset, Pa.
PA—Phil. A. Shaffer, " "
EM—Phil. A. Shaffer, " "
S of H—Mules and rope; track gauge 42 in. (Will install Elec. Haulage.)
S of M—Hand and 3 comp. air mach.
PP—2 Erie return tubular boilers, total 180 H. P., 1 compressor. (Expect to purchase power.)
EMP—64. Last fiscal year output, 25,102 tons.

HARPER COAL CO.
Harper and Leek Run Mines; Drifts; Pgh. Seam, 56 to 60 in. thick.
PO—Turtle Creek, Pa.; SP—Hall, Pa.; CTY—Allegheny; RR—Union.
PR—John Irvin......Turtle Creek, Pa.
TR—Thos. Harper, " " "
PA—Thos. Harper, " " "
MS—Thos Harper, " " "
S of H—Mules; track gauge, 44 in.
S of M—Hand.
EMP—60. Last fiscal year output 53,585½ tons.
Sales Agent, Thos. Harper, Turtle Creek, Pa.

HARBISON-WALKER REFRACTORIES CO.
General Office, Farmers Bank Bldg., Pittsburg, Pa.
PR—H. W. Croft......Pittsburg, Pa.
GM—H. W. Croft, " "
TR—Wm. Walker, " "
PA—C. T. Stewart, " "
GS—J. M. Baker, Woodland, Pa., and Nin McQuillen, Clearfield, Pa.

Riverside Mine; Drift; Moshannon Seam, 36 in. thick.
PO—Clearfield, Pa.; SP—Same; CTY—Clearfield; RR—P. R. R., T. & C. Div.
S of H—Mules; track gauge, 36 in.
S of M—Hand.

Retort Mine; Drift; "B" Seam, 48 in. thick.
PO—Sandy Ridge, Pa.; SP—Retort, Pa.; CTY—Centre; RR—P. R. R.
MS—Charles Heath..Sandy Ridge, Pa.
SCO—Vulcan Trading Co, Retort, Pa., Powellton P. O.
S of H—1 Steam loco.
S of M—Hand.
EMP—18. Last fiscal year output, 10,000 tons.

HARDING COAL CO.
Margaret Mine; Drift; Redstone Seam, 48 to 60 in. thick.
PO—Elk Lick, Pa.; SP—West Salisbury, Pa.; CTY—Somerset; RR—B. & O., Salisbury Br.
PR—James Harding......Elk Lick, Pa.
TR—James Harding, " "
MS—James Harding, " "
S of H—Mules
S of M—Hand.
EMP—20. Last fiscal year output 15,000 tons.
Formerly Fairview Mine Meyersdale Smokeless Coal Co.

HARRIS, JAS. & SONS.
Harris Mine No. 1, Drift, Miller or "B" Seam, 3 ft. thick.
PO—Lilly, Pa.; SP—Same; CTY—Cambria; RR—P.R.R.
PR—Jas. Harris ....Lilly, Pa.
TR—Jas. Harris, " "
GM—John Harris, " "
MS—Jas. Harris, " "
PA—John Harris, " "
S of H—Mules, rope and gravity; track gauge 36 in.
S of M—Hand.
PP—1 Vertical 25 H.P. boiler.
EMP—23. Last fiscal year output 17,600 tons.

HARVEY COAL CO.
Harvey Mine; Drift; L. Kittanning Seam, 3 ft. thick.
PO—Strattonville, Pa.; SP—Same; CTY—Clarion; RR—L. E., F. & C.
PR—W. A. Crawford, Strattonville, Pa.
GM—J. M. Harvey, " "
TR—J. M. Harvey, " "
GS—J. M. Harvey, " "
PA—J. M. Harvey, " "
SCO—Brush Run Supply Co., " "
S of H—Mules and rope. Track gauge 36 in.
S of M—Hand.
PP—2 Erie boilers.
EMP—80. Last fiscal year output 45,000 tons.

HASTINGS COAL & COKE CO.
Kinport No. 1 Mine, Drift, L. Freeport Seam, 3 ft. 10 in. to 3 ft. thick.
PO—Cherry Tree, Pa.; SP—Kinport, Pa.; CTY—Indiana.
PR—J. C. Cosgrove.....Johnstown, Pa.
TR—W. H. McAteer.........New York
GM—John C. Cosgrove,...Johnstown, Pa.
GS—Geo. Simpson.....Cherry Tree, Pa.
PA—J. C. Cosgrove.....Johnstown, Pa.
EM—Chas. Schlecher ....Spangler, Pa.
SCO—Kipport Store Co. Buyer, Stanley Poloskey, Cherry Tree, Pa.

S of H—2 Elec. loco.; track gauge 36 in.
S of M—3 Elec. mach.; hand.
PP—150 K. W. motor generator, 3 pumps. Buy power.
EMP—100. Last fiscal year output, 75,000 tons. Coke ovens, 50.
Sales Agent, Mr. Cosgrove, 420 Stephen Girard Bldg., Philadelphia, Pa.

HARTLAND, E. F. COAL & COKE CO.
Out of business.

HAWS, A .J. & SONS, LTD.
Shaft and Coopersdale Mines; Shafts; Miller Seam, 18 to 49 in. thick.
PO—Johnstown, Pa.; SP—Same; CTY—Cambria; RR—P. R. R,
CHAIRMAN—Wm. H. Haws, Johnstown, Pa.
TR—Jas. P. Thomas, " "
GM—Harry L. Tredennick, " "
MS—John T. Werry and Wm. Ramstedt,
Work Supt—Ralph Cooper, Johnstown, Pa.
S of H—Mules; track gauge, 28 in.
S of M—Hand.
PP—Power purchased; 4 pumps.
EMP—67. Last fiscal year output 49,872 tons.
Mine coal for their own use.

HAYS, W. S. B., COAL CO.
Calhoon Mine; Drift; Pittsburg Seam, 54 in. thick.
PO—408 Eighth Ave., Homestead, Pa.; SP—Munhall, Pa.; CTY—Allegheny;
RR—P. & L. E., P. V. & C.
PR—W. S. B. Hays......Homestead, Pa.
GM—W. S. B. Hays, " "
TR—W. S. B. Hays, " "
GS—A. P. Hays.........Munhall, Pa.
PA—L. O. Hays, Jr. Forest ave., Mifflin Township, Pa.
EM—Wm. W. Darsie, Fifth Ave., Pittsburgh, Pa.
S of H—Mules and gravity; track gauge 42 in.
S of M—Hand.
EMP—15. Last fiscal year output 7,594 tons.

HEATH, R. H. & COMPANY
General Office, Duquesne, Pa.
Mifflin No. 2 Mine; Drift; Pittsburgh Bituminous Seam; 54 to 66 in. thick.
PO—Duquesne, Pa; SP—Same; CTY—Allegheny; RR—Union.
GS—M. R. Smith, McKeesport, Pa.
MS—R. H. Heath, Glassport, Pa.
S of H—Mules. Track gauge 41 in.
EMP—7. Last fiscal year output, 7000 tons.
Note—Formerly the Mans Williams Coal Company.

HEATON, ISAAC F., & SON.
Pearl, Tunnel and Pioneer No. 3 Mines; Drift; "B" Seam, 36 in. thick.
PO—Viaduct, Pa.; SP—Pearl, Pa.; CTY—Clearfield; RR—N. Y. C.
PR—Isaac F. Heaton....Viaduct, Pa.
TR—Walter E. Heaton, " "
GM—Isaac F. Heaton, " "
MS—Isaac F. Heaton, " "
PA—Walter E. Heaton, " "
S of H—Mules and rope.
S of M—Hand.
EMP—40. Output will be 150 tons per day.
Successors to O. J. Harm & Co.

HECLA COAL & COKE COMPANY.
General Office, Pittsburgh, Pa.
Isabella Mine; Shaft; Pittsburgh Seam; 78 to 102 in. thick.
PO—Brownsville, Pa; SP—Isabella, Pa; CTY—Fayette; RR—Monongahela.
PR—T. H. Given, .. Pittsburgh, Pa.
TR—J. H. Hillman, Jr. " "
GS—W. L. Affelder, " "
MS—W. J. Kearns, Brownsville, Pa.
CE—Geo. S. Baton & Co., Pittsburgh, Pa
SCO—Isabella Supply Co., buyer, M. P. Sullivan, Pittsburgh, Pa.
S of H—2 elec. locos. Track gauge 44 inches.
S of M—10 elec. machs.
PP—1 Geary Water tube boiler, total 1700 H. P., 2 gen. units, 550 volts D. C., 3 pumps.
EMP—300. 124 Bee Hive and 136 Rectangular Coke Ovens.
Note—Successors to Isabella Connellsville Coke Company.

HEGARTY'S S. SONS.
Oakland Nos. 2 and 3 Mines; Drift; B Seam, 3 ft. 9 in. to 5 ft. thick.
PO—Coalport, Pa.; SP—Same; CTY—Clearfield; RR—P. R. R., P. & N. W. Branch.
GM—W. W. Hegarty....Coalport, Pa.
PA—W. W. Hegarty, " "
SM—W. W. Hegarty, " "
EM—W. W. Hegarty, " "
MS—John Shaw and John Garrity, Coalport, Pa.
S of H—Mules and rope, track gauge 36 in.

S of M—Hand.
PP—2 Return tubular boilers, total 120 H. P.
EMP—151.
(Old information.)

HEIL, WM..
See Conestoga Coal Co.

HENDERSON COAL CO.
General Office, Pittsburgh, Pa.
PR—W. M. Henderson...Pittsburgh, Pa.
TR—W. M. Henderson, " "
GM—W. M. Henderson, " "
PA—E. E. Ebbert, " "
GS—Arthur McCune, ...Charleroi, Pa.
EM—Arthur McCune, " "
SCO—Henderson Supply Co. Buyer, J. C. Bortz, Hendersonville, Pa.
Sales Agent, W. M. Henderson.

Irons Mine, Drift, Pittsburgh Seam, 6 ft. thick.
PO—Charleroi, Pa.; SP—East Charleroe, Pa; CTY—Westmoreland; RR—P. & L.E.
S of H—2 elec. loco. Track gauge 42 in.
S of M—1 elec mach. and pick mining.
PP—Buy power.
EMP—125. Last fiscal year output 196,418 tons.

Kennedy Mine, Drift, Pittsburgh Seam, 5 ft. 6 in. thick.
PO—Webster, Pa.; SP—Same; CTY—Westmoreland; RR—P. & L. E.
S of H—4 Elec. loco.; track gauge 42 in.
S of M—4 elec. mach. and pick mining. mining.
PP—Buy power.
EMP—225. Last fiscal year output 106,899 tons.

Umpire Mine, Drift, Pittsburgh Seam, 7 ft. thick.
PO—Brownsville, Pa.; SP—Same; CTY—Fayette; RR—Monon. R.R.
MS—C. C. McVicker...Brownsville, Pa.
S of H—1 Elec. loco.; track gauge 44 in.
S of M—2 Elec. machines and pick mining.
PP—Buy power.
EMP—75. Last fiscal year output, 52,228 tons.

No. 1 Mine; Shaft; Pittsburgh Seam. 66 in. thick.
PO—R. D. No. 3, Canonsburg, Pa.; SP—Hendersonville, Pa.; CTY—Washington; RR—Montour.
S of H—3 elec. locos. Track gauge 42 in.
S. of M—7 elec. mach.
PP—Power purchased.
EMP—150. Last fiscal year output 58,892 tons.

HENRIETTA COAL CO.
Henrietta No. 5 Mine. CTY—Clearfield.
GS—Asa Spencer........Houtzdale, Pa.
No report.

HENRIETTA COAL MINING COMPANY.
General Office, Altoona, Pa.
Henrietta No. 2 Mine; Shaft; "B" or Miller Seam 30 to 44 in. thick.
PO—Dunlo, Pa.; SP—Same; CTY—Cambria. RR—P. R. R., South Fork Branch
PR—G. R. Byrd......New York, N. Y.
TR—Gardner Cassett ......Phila., Pa.
GS—B. E. Phillips ....Dunlo, Pa.
PA—B. E. Phillips, " "
EM—J. S. Sillyman & Co., Altoona, Pa.
EE—Chas. Bracken ....Dunlo, Pa.
SCO—Henrietta Supply Co., Buyer, W. D. Cannan, Altoona, Pa.
S of H—Mules, rope and 2 elec. loco., track gauge 36 in.
S of M—Hand.
PP—6 Return tubular boilers, total 900 H.P., 2 gen. units 550 volts D.C., 2 pumps.
EMP—320. Last fiscal year output 214,251 tons.

HERMINIE COAL CO.
General Office, 506 2nd Natl. Bank Bldg., Pittsburgh, Pa.
Herminie Collieries Mine; Drift; Waynesburg Seam; 72 to 77 in. thick.
PO—Herminie, Pa.; SP—Same; CTY—Westmoreland; RR—Penna., Hempfield branch.
PR—Samuel A. Taylor...Pittsburgh, Pa.
GM—Samuel A. Taylor, " "
CE—Samuel A. Taylor, " "
TR—George Paul, " "
PA—J. M. Taylor, " "
GS—Samuel Mitchell.....Herminie, Pa.
EM—Harrop, Hopkins & Taylor, Pittsburgh, Pa.
S of H—Mules and 1 elec. loco. Track gauge 42 in.
S of M—Hand and 2 elec. mach.
PP—Purchase power. 1 elec. pump.
EMP—30.

HEVERLY COAL CO.
General Office, Altoona, Pa.
Cammos Mines Nos. 1 and 2, Drifts, C Vein, 30 to 36 in. thick.
PO—Coalport, Pa. SP—Heverly, Pa; CTY—Clearfield; RR—P. R. R., Bellwood Div.
PR—Dr. D. Kaufman.....Altoona, Pa.
MS—Samuel McCall.....Coalport, Pa.
TR—L. M. Ryan.........Altoona, Pa.
GM—L. M. Ryan, " "
GS—L. M. Ryan, " "
PA—L. M. Ryan, " "
CE—J. Sillyman & Co., " "
EM—J. Sillyman & Co., " "
SCO—Heverly Supply Co. Buyer, Wm. A. Beiber, Coalport, Pa.
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—Buy power. 440 volts A. C. 3 phase, 60 cycles,
EMP—175. Last fiscal year output 45,248 tons.
Sales Agency, Cambria & Moshannon Coal Co.

HILL BROS COAL COMPANY.
General Office, Morrisdale, Pa.
Ashman 4 & 5 Mines; Drifts; E Veins; 30 in. thick.
PO—Morrisdale, Pa; SP—Same; CTY—Clearfield RR—N. Y. C. Hawk Run, Branch.
TR—W. D. Hill, ... Morrisdale, Pa.
GM—W. D. Hill, " "
GS—W. D. Hill, " "
MS—Geo. M. Hill......Morrisdale, Pa.
S of H—Mules.
S of M—Hand.

HILL TOP COAL MINING CO.
Hill Top Mine; Drift; "B" or Miller Seam; 37 to 47 in. thick.
PO—Heshbon, Pa.; SP—Same; CTY—Indiana; RR—B. R. & P. & Penna.
PR—B. Frank Smith......Heshbon, Pa.
GM—B. Frank Smith, " "
PA—B. Frank Smith, " "
SM—B. Frank Smith, " "
EM—R. W. Weacy.......Expedit, Pa.
SCO—Heshbon Supply Co., Heshbon, Pa.
S of H—Mules.
EMP—14. Last fiscal year output 7,325 tons.
Note—Successors to Auld Run Coal Co.

HILLIMAN-NEFF COKE COMPANY
Slope Mine; Connellsville Seam; 84 to 96 in. thick.
PO—Masontown, Pa.; SP—Ifield, Pa.; CTY—Fayette; RR—Monongahela.
PR—J. H. Hillman, Jr.,..Pittsburgh, Pa.
TR—Robt. W. Flenniken, " "
GM—W. L. Affelder, " "
PA—Jos. M. Leithead, " "
EM—F. E. Gebhart.....Masontown, Pa.
MM—Ray Martin, " "
MS—A. N. Young, " "
SM—M. P. Sullivan.....Pittsburgh, Pa.
S of H—Mules and 2 elec. locos. Track gauge 36 in.
S of M—Hand and 10 elec. mach.
PP—4 return tubular boilers, total 725 H. P., 2 gen. units, 250 volts D. C., 1 pump.
EMP—215. Last fiscal year output. 211,733 tons. Coke ovens, 196 Bee Hive.
Sales Agency, J. H. Hillman Sons Co.

HILLSDALE COAL & COKE CO.
Glen Campbell, Pa. No report.

HILLWORTH COAL CO.
Belmont Nos. 1, 2 and 3 Mines; Drifts; "C" Prime and "E" Seams; 36 to 50 in. thick.
PO—Acosta, Pa.; SP—Same; CTY—Somerset; RR—B. & O., Quemahoning Branch.
PR—A. W. Hillebrand, New York, N. Y.
TR—W. F. Ainsworth, " " " "
MS—T. A. Courtney, Acosta, Pa.
EE—L. O. Gregg.........Windber, Pa.
EM—S. E. Dickey & Co., Johnstown, Pa.
SCO—Acosta Supply Co. Buyer N. B. Smith, Acosta, Pa.
S of H—2 elec. loco. and mules. Track gauge, 42 in.
S of M—Hand.
PP—Power purchased.
EMP—105. Last fiscal year output 78,000 tons.
Sales Agency, A. W. Hillebrand Co., New York, N. Y.
Successors to the Belmont-Quemahoning Coal Co.

HINES COAL CO.
General Office, Land Title Bldg., Philadelphia, Pa.
Hines Nos. 1 and 2 Mines; Drifts; "B" Seam. 36 to 48 in. thick.
GS—C. E. Sharpless, Ebensburg, Pa.
Mine is about exhausted.

HIRSH COAL CO.
Flora Mine; Drift; "B" Seam, 40 in. thick.
PO—Hooversville, Pa.; SP—Same; CTY—Somerset; RR—B. & O.
MS—Alex. Galbraith...Hooversville, Pa.
EMP—15. Output 6,000 tons.
Sales Agency. James Dugan, Harrison Bldg., Philadelphia, Pa.

HOLT, W. F.
Phoenix Mine, Drift, D. & E. Seam 2½ to 5 ft. thick.
PO—Philipsburg, Pa. SP—Hawk Run. CTY—Centre. RR—N.Y.C.&H.R.
PR—W. F. Holt......Philipsburg, Pa.
MS—Tom Davis.......Philipsburg, Pa.
S of H—Mules, track gauge 36 in.
S of M—Hand.
PP—2 Elec. pumps. Purchase power.
EMP—45. Last fiscal year output 33,440 tons.

HOME COAL CO.
Home Mine; Drift; Pgh. Seam 66 in. thick.
PO—Monongahela, Pa.; SP—Same; CTY—Washington; RR—P. R. R.
CM—R. H. Robinson, Monongahela, Pa.
PA—R. H. Robinson, " "
MS—C. R. Bivens, " "
S of M—Electric machine.
S of H—Mules.
EMP—5 Local mine.

HOMER CITY COAL CO.
General Office, Johnstown, Pa.
Homer Mine; Drift; Up. Freeport Seam, 72 to 78 in. thick.
PO—Homer City, Pa.; SP—Same; CTY—Indiana; RR—P. R. R., Indiana Branch.
PR—John C. Cosgrove, Johnstown, Pa.
GM—John C. Cosgrove, " "
PA—Lafayette Tuck.....Homer City, Pa.
MS—Lafayette Tuck, " " "
EM—Chas. Schlicker......Spangler, Pa.
S of H—Rope and mules; track gauge 42 in.
S of M—2 Comp. air mach. and hand.
PP—2 Return tubular boilers, total 275 H.P., 2 gen. units, 1 compressor and 3 pumps.
EMP—150. Last fiscal year output 160,000 tons.

HOOVER, JAS. H.,
Hoover Mine, Slope and Drift.
PO—McClellandtown, Pa.; SP—Ache Junction, Pa.; CTY—Fayette; RR—P. R. R.
GM—Jas. H. Hoover, McClellandtown, Pa.
PA—Jas. H. Hoover, " "
MS—John Yanger, " "
S of H—Rope.
S of M—Hand.
PP—1 Return tubular boiler, total 120 H. P., 1 air comp., 1 pump.
EMP—64. Last fiscal year output, 53,550 tons. Coke ovens, 74.
(Old information.)

HOPE COKE CO.
General Office, Uniontown, Pa.
Hope Mine, Drift, Sewickley, Seam.
PO—Smithfield, Pa., R.F.D. No. 7, SP—Shoaf, Pa., CTY—Fayette.
RR—B. & O.

PR—J. M. Hustead, II..Uniontown, Pa.
TR—J. E. Hustead, " "
GM—W. B. Hustead, " "
PA—J. E. Hustead, " "
GS—Randolph Michener, " "
CE—H. S. Burchinal, " "
MS—W. R. Michener....Smithfield, Pa.
SM—Geo. Drengacy, " "
S of H—Rope and mules.
S of M—Hand.
PP—1 60-H. P. boiler, 1 Pump.
EMP—38. Coke ovens, 38 Bee Hive.
Sales Agent, J. E. Hustead, Uniontown, Pa.

HORN, J. EDWARD, & CO.,
GM—J. Edward Horn, Philipsburg, Pa.
Horn Nos. 7, 8, 9, 12, 14 mines; Drift; "A" and "B" Seam; 3-8ft. thick.
PO—Philipsburg, Pa.; SP— Same; CTY—Centre; RR—N.Y.C.&H.R.
S of H—2 Elec. loco., rope and mules; track gauge 36 in.
S of M—Hand.
PP—Purchase power.
EMP—321. Last fiscal tyear output 231,484 tons.

Monroe Mine; Drift; "C" Seam, 30-32 in.
PO—Osceola Mills, Pa.; SP—Same; CTY—Clearfield. RR—P.&S.
S of H—Mules, track gauge 30 in.
S of M—Hand.
EMP—23. Last fiscal year output 25000 tons.
(Old information.)

HORNEL COAL CO.
Hickman, Pa. No report.

HOSTETTER CONNELLSVILLE COKE CO.
(H. C. FRICK COKE CO.)
General Office, Carnegie Bldg., Pittsburgh, Pa.
PR—W. H. Clingerman,..Pittsburgh, Pa.
TR—Philip Keller, " "
Secy—D. H. Coble, " "
PA—T. S. Duncan, " "
Auditor C. P. Parker. " "
GS—Clay F. Lynch......Scottdale, Pa.
GS—Asst. W. H. Glasgow, " "
CE—T. W. Dawson, " "
Mech. Engr.—G. E. Huttelmaier, Scottdale, Pa.
EE—W. A. Chandler, " "
SCO—Union Supply Co., Buyer, C. L. Steiner, Frick Bldg., Pittsburgh, Pa., Genl. Supt. of Stores, John Lynch, Uniontown, Pa.
Hostetter Mine, Slope, Pgh. Seam, 7 to 7½ ft. thick.
PO—Hostetter, Pa. SP—Same. CTY—Westmoreland. RR—P. R. R., Unity Branch.
MS—R. W. Maher, .. Hostetter, Pa.
S of H—1 steam loco.
S of M—7 Comp. air machines.
PP—17 return tubular boilers, total 225 H. P., 2 comp. and 7 pumps.
EMP—348. Last fiscal year output 331,316 tons.

Whitney Mine, Slope, Pgh. Seam, 7 to 7½ ft. thick.
PO—Whitney, Pa. SP—Same. CTY—Westmoreland. RR—P. R. R., Unity Branch.
MS—George Eustis, ... Whitney, Pa.
S of H—2 steam locos.
S of M—7 Comp. air machines.
PP—9 return tubular boilers, total 1,180 H. P.
EMP—341. Last fiscal year output 347,414 tons.

HOWARD GAS COAL CO.
General Office, Greensburg, Pa.
Mt. Grey Mine, Drift, Pittsburgh Seam, 78 to 84 in. thick.
PO—Saltsburg, Pa., SP—Same, CTY—Indiana. RR—Penna. Conemaugh Div.
PR—J. Howard Patton, Greensburg, Pa
TR—Howard C. Patton, " "
GM—Howard C. Patton, " "
GS—Howard C. Patton, " "
PA—Howard C. Patton, " "
EM—Robt. Morris, " "
MS—George Weightman, Saltsburg, Pa.
SCo—Howard Supply Co., " "
Buyer, T. D. Hackley, " "
S of H—1 Elec. loco., track gauge 40 in.
S of M—4 elec. machines and 15 comp. air mach.
PP—4 Erie City return tubular boilers, total 600 H. P., 1 Gen. unit 500 volts D. C., 1 Air compressor and 3 pumps.
EMP—150. Last fiscal year output 117,805.72 tons.
Sales Agent, J. D. Hackley.

HUDSON COAL MINING CO.
General Office, Punxsutawney, Pa.
Hudson Mine; Drift; Upper Freeport Seam, 3 1-2 to 4 1-2 ft. thick.
PO—Winslow, Pa.; SP—Same; CTY—Jefferson.
RR—Penna., Belwood-Punxsutawney Div.
PR—B. E. Coon...........Kane, Pa.
MS—J. C. Driscoll...Punxsutawney, Pa.
TR—J. C. Driscoll, " "
PA—J. C. Driscoll, " "
S of H—Mules; Track gauge 36 in.
S of M— Hand.
Idle last year.
Sales agent, J. C. Driscoll, Punxsutawney, Pa.

HUFF COAL COMPANY
General Office, Humbert, Pa.
Baldwin Mine; Drift C Prime Seam; 34 to 37 in. thick.
PO—Humbert, Pa; SP—Same; CTY—Somerset; RR—Ursina & North Fork.
PR—I. T. Huff..........Humbert, Pa.
GM—H. L. Campbell, " "
S of H—Gravity.
S of M—Hand.

HUGHES, W. H. & CO.
General Office, Altoona, Pa.
GM—W. H. Hughes....Altoona, Pa.
GS—W. H. Hughes.......Altoona, Pa.
PA—W. H. Hughes, " "
ME—W. H. Hughes, " "
Sales Agent, W. H. Hughes, Altoona, Pa.

Hughes No. 1 Mine; Drift "B" Seam 34 to 44 in. thick.
PO—Lilly, Pa.; SP—Same; CTY—Cambria; RR—P.R.R. Lilly Br.
MS—David Mort..........Lilly, Pa
S of H—1 Elec. loco., track gauge 36 in.
S of M—Hand.
PP—Power purchased.

Hughes No. 2 Mine; Slope, B Seam 40 to 54 in. thick.
PO—Cassandra, Pa.; SP—Bens Creek, Pa.; CTY—Cambria; RR—P.R.R. Ben's Creek Branch.
MS—George Hassenpflug....Lilly, Pa.
S of H—3 Elec. loco. and rope; track gauge 36 in.
S of M—2 Elec. mach. and hand.
PP—2 pumps. Purchase power.
EMP—175. Last fiscal year output 103,676 tons.

HUMPHRIES, E. A., COAL & COKE CO

General Office, Scottdale, Pa.
Chestner No. 2 Mine, Drift, 7½ to 8 ft. thick.
PO—Derry, Pa.; R.F.D.; SP—Loyalhanna, Pa.; CTY—Wesmoreland.
RR—Penna. R.R., Bradenville Branch.
PR—W. F. Stauffer.....Scottdale, Pa.
TR—J. M. Zimmers, " "
GM—Clarence Deal.........Derry, Pa
MS—Clarence Deal, " "
PA—Clarence Deal, " "
MF—John Ainscough.......Latrobe, Pa.
CE—S. M. Foust.
EM—S. M. Foust.
MM—A. Allison............Derry, Pa
SCO—E. A. Humphries Supply Co.
Buyer, Clarence Deal, Derry, Pa. R.D.1.
S of H—Rope; 1 Steam loco., track gauge 42 in.
S of M—Hand.
PP—2 Erie City return tubular boilers, total 400 H. P., 1 Gen. unit 250 volts D. C., 1 pump.
EMP—48. Last fiscal year output 47,017 tons.
50 Rectangular coke ovens.
Sales Agent, J. M. Zimmers, Scottdale, Pa.

HUNTINGDON COAL CO.

Delaware No. 1 Mine; Slope; Fulton Seam, 36 to 72 in. thick.
PO—Bedford, Pa.; SP—Coaldale, Pa.; CTY—Bedford; RR—H. & B. T.
PR—John White.........Bedford, Pa.
GS—Daniel Everhart, " "
GM—E. A. Miller. " "
TR—E. A. Miller. " "
PA—E. A. Miller, " "
MS—Daniel Everhart, " "
SCO—Edge Hill Supply Co. Buyer, Irwin Cypher, Bedford, Pa.
S of H—Rope.
S of M—Hand.
PP—2 return tubular boilers, total 70 H. P., 2 pumps, gen. units, 250 volts D. C.
EMP—90.

HUSTEAD-SEMANS COAL & COKE CO.

General Office, Uniontown, Pa.
Hustead Mine, Slope, Pittsburgh Seam.
PO—East Millsboro, Pa. SP—Same. CTY—Fayette. RR—P. R. R., Monon. Div.
GM—J. E. Hustead, ..Uniontown, Pa.
PA—J. E. Hustead, " "
MS—John C. Miller...E. Millsboro, Pa.
SM—Hustead-Semans Supply Co. Buyer, F. M. Hackney, East Millsboro, Pa.
S of H—Rope.
S of M—Elec. and comp. air machs.
PP—9 boilers, total 1,430 H. P. gen. units, 250 volts D. C.
EMP—125.

IDEAL COAL COMPANY

General Office, 1st Natl. Bank Bldg., Johnstown, Pa.
PR—John S. Kenney, 659 Grove Ave., Johnstown, Pa.
TR—G. W. Reese, 213 Dibert St., Johnstown, Pa.
GM—Chas. S. Ling, 669 Grove Ave., Johnstown, Pa.
PA—Chas. S. Ling. 669 Grove Ave., Johnstown, Pa.
CE—Fetterman Eng. Co., Johnstown Trust Co. Bldg., Johnstown, Pa.
EM—Fetterman Eng. Co., Johnstown Trust Co. Bldg., Johnstown, Pa.
MS—Griffith Powell. 546 Cypress Ave., Johnstown, Pa.
EE—J. M. Carr........Johnstown, Pa.

Sunnyside No. 1 Mine; Drift; Upper Kittanning Seam; 30 to 48 in. thick.
PO—Johnstown, Pa.; SP—Same; CTY—Cambria; RR—Penna. & B. & O., Johnstown & Stoney Creek branch.
S of H—Mules and 2 elec. locos. Track gauge 36 in.
S of M—Hand and 1 elec. mach.
EMP—4. Last fiscal year output, 2586 tons.
Note—At present only mining domestic coal. Expect to resume in full about March 1st.

Sunnyside No. 3 Mine; Drift Upper Freeport Seam; 36 to 44 in. thick.
PO—Johnstown, Pa.; SP—Same; CTY—Cambria; RR—Penna. & B. & O., Johnstown and Stoney Creek Branch.
S of H—Mules and gravity. Track gauge 36 in.
EMP—69. Last fiscal year output, 52,553 tons.
PP—Motor generator, 250 volts D. C., 4000 volts A. C., 3 phase and 60 cycle. Purchase power.
Sales Agent, Chas. S. Ling, 669 Grove Ave., Johnstown, Pa.
Note—Successors to Sunnyside Coal Co.

INDIAN HEAD COAL & COKE CO.

Slope Mine; Freeport Seam, 48 in. thick.
PO—Indian Creek, Pa.; SP—Same; CTY—Fayette; RR—B. & O.
PR—J. A. Sheetz.....Indian Creek, Pa.
TR—W. D. Walthour, " "
GM—C. S. Pore, " "
PA—C. S. Pore, " "
EM—C. S. Pore.......Indian Creek, Pa
MS—C. S. Pore, " "
S of. H—Rope.

INDIANA COAL CO.

Now H. E. Clark.

INDIANA SMOKELESS COAL CO. (THE)

PR—T. M. Kurtz, Punxsutawney, Pa.
Secy—Vernon F. Taylor, Brockawayville, Pa.
No report.
Note—Not operating.

IRISH W. L. & COMPANY.

Lessee of Chestnut Ridge Coal Mining Co.
Indiana No. 6 Mine; Drift; D or E Seam; 40 to 52 in. thick.
PO—Gipsy, Pa. SP—Same; CTY—Indiana RR— Y. N. C.
GM—J. H. Miller, ..Glen Campbell Pa.
GS—J. H. Miller. " " "
PA—J. H. Miller. " " "
MS—W. M. Timble, " " "
S of H—1 Gasoline Loco.
S of M—Hand.

IRVONA COAL & COKE CO

General Office, Philadelphia, Pa.
Irvona Nos. 5 and 10 Mines; Drift and Slope; "B" Seam, 48 to 60 in. thick.
PO—Rosebud, Pa.; SP—Coalport, Pa.; CTY—Clearfield; RR—P. R. R., P. & N. W. Br.
PR—Roy A. Hatfield..Philadelphia, Pa.
TR—Joseph T. Hilles, " "
PA—Joseph T. Hilles, " "
EM—P. F. Wom ldorf, " "
GM—A Bathgate........Coalport, Pa.
GS—A. Bathggate, " "
MS—George Bathgate, " "
MM—Jas. Bathgate and W. F. Boone, Coalport, Pa.
EE—John Bownell, " "
SCO—Blaine City Supply Co.; Buyer, A. Bathgate, Coalport, Pa.
S of H—3 Elec. loco.; track gauge, 36 in.
S of M—8 Elec. mach.
PP—7 Return tubular boilers. total 450 H. P., 3 gen. units 250 volts D. C., 3 pumps.
EMP—200. Coke ovens, 100 Bee Hive. Last fiscal year output, 150,000 tons.

ISABELLA CONNELLSVILLE COKE CO.

See Hecla Coal & Coke Co.

IVY RIDGE COAL CO.

See Brandenburg Coal Mining Co.

JAFFA COAL MINING CO.

Florence Mine; Drift; B. Seam 4 ft. thick.
PO—Brisbin, Pa.; SP—Same; CTY—Clearfield; RR—P. R. R., Amesville Br.
PR—W. H. Patterson, ...Clearfield, Pa.
TR—T. V. Gould..........Brisbin, Pa.
PA—T. V. Gould, " "
GM—George Lobb, " "
GS—George Lobb, " "
S of H—Mules.
S of M—Hand.
EMP—25. New Operation.
Sales Agency, W. A. Gould & Bro., Brisbin, Pa.

JANESVILLE COAL CO.

General Office, Clearfield, Pa.
Vulcan Mine, Shaft. "B" Miller seam.
PO—Ramey, Pa.; SP—Fernwood; CTY—Clearfield.
PR—Fred G. Belts.....Clearfield, Pa.
GM—Fred G. Belts, " "
PA—Fred G. Belts, " "
S of H—Mules; Track gauge 3 ft.
S of M—Hand.
PP—2 Return tubular boilers, total 200 H. P.
Last fiscal year output 40,000 tons.

JAMISON COAL & COKE CO.

General Office, Oliver Bldg., Pittsburgh, Pa.
5 mines in Pa., 3 in W. Va.
PR—J. M. Jamison, Oliver Bldg., Pgh., Pa.
TR—D. MacLeod, " "
PA—M. W. Head, " "
GM—R. H. Jamison....Greensburg, Pa.
EM—C. E. Cowan, " "
GS—J. C. Jamison, Greensburg, Pa., and T. P. Tatta, Hannastown, Pa.
SCO—Jamison Supply Co. Buyer, E. B. Anthony, Greensburg, Pa.
Sales Agents, W. G. Ireland and R. Donandson, Oliver Bldg., Pittsburgh, Pa.

No 1 Mine, Slope, Pgh. Seam, 78 to 90 in. thick. Operate washery.
PO—Luxor, Pa.; SP—Same; CTY—Westmoreland.
RR—P. R. R., Alexandria Branch.
MS—A. J. Mase..........Luxor, Pa.
SM—J. F. Harsha, " "
S of H—7 Elec. loco., mules and rope; track gauge 40 in.
S of M—8 Elec. mach. and hand.
PP—5 Water Tube, Stirling Boilers, total 1500 H. P., 2 gen. units, 275 volts D. C., 3 pumps.
EMP—450. Coke ovens, 400 Bee Hive Last fiscal year output 599,160 tons.

No. 2 Mine; Shaft; Pgh. Seam, 84 to 90 ins. thick. Operate washery.
PO—Hannastown, Pa.; SP—Same; CTY—Westmoreland.
RR—P. R. R., Alexandria Branch.
MS—H. W. Sadler.....Hannastown, Pa
SM—W. C. Feeley, " "
S of H—Mules and 8 elec. loco. track gauge 40 in.
..**S of M**—Hand and 8 Elec. mach.
PP—12 Water tube boilers, 8 Stirling, 4 Heine, total 4,200 H.P., 2 gen. units, 275 volts D.C., 7 pumps
EMP—600. Coke ovens, 516 Bee Hive. Last fiscal year output 648,590 tons.

No. 3 Mine; Shaft; Pgh. Seam, 7 ft. thick.
PO—Forbes Road, Pa.; SP—Same; CTY—Westmoreland; RR—P. R. R., Alexandria Br.
MS—Ralph E. Jamison, Forbes Road, Pa.
SM—No. 3, Wm. Grigsman, Forbes Road, Pa.
S of H—9 Elec. loco., mules and rope; track gauge 40 in.
S of M—16 Elec. mach.
PP—Water tube boilers, 4 Stirling, 1 Heine, total 1600 H. P., 3 gen. units, 275 volts D. C., 4 pumps.
EMP—400. Last fiscal year output 499,630 tons.

No. 4 Mine, 2 Slopes, Pgh. Seam, 7 ft. thick; Operate, Washery.
PO—Crab Tree, Pa.; SP—Same; CTY—Westmoreland.
RR—P. R. R., Alexandria Branch.
MS—E. M. Turney......Crab Tree, Pa.
SM—W. P. Harris, " " "
S of H—12 Elec. loco., mules and rope; track gauge 40 in.
S of M—17 Elec. mach.
PP—8 Water Tube Heine Boilers. total 1800 H. P., 3 gen. units, 275 volts D. C. and 2 pumps.
EMP—800. Coke ovens. 492 Bee Hive. Last fiscal year output 1,159,810 tons.

No. 6 Mine; Slope; Pgh. Seam; 84 in. thick.
PO—Greensburg, Pa., R. D. 4; SP—Jamison Colliery No. 6; CTY—Westmoreland; RR—P. R. R., Alexandria Br.
MS—R. P. Jamison, R. D. 4, Greensburg, Pa.
SM—W. A. Morton, R. D. 4, Greensburg, Pa.
S of H—Mules, rope and 4 elec. locos. Track gauge 40 ins.
S of H—4 elec. mach.
PP—Power furnished by No. 3 plant.
EMP—200. Last fiscal year output 280,340 tons.

JEFFERSON COAL CO.

General Office, South Bethlehem, Pa.
Coal Glen Nos. 1 and 2 Drifts.
PO—Coal Glen, Pa. SP—Same. CTY—Jefferson. RR—B. R. & P.
GM—Austin Blakeslee, Coal Glen, Pa
PA—F. B. Blakeslee, .. Coal Glen, "
MS—F. B. Blakeslee, " "
EM—C. A. Blakeslee,..Falls Creek, "
SCO—Abbott & Blakeslee Co.
S of H—Mules and 1 steam loco.
S of M—Hand.
PP—1 return tubular boiler, total 75 H. P., 2 pumps.
EMP—183. Last fiscal year output 155,200 tons.
(Old information.)

JEFFERSON & CLEARFIELD COAL & IRON COMPANY.

General Office, Punxsutawney, Pa.
PR—L. W. Robinson, Punxsutawney, Pa.
TR—Geo. H. Clune, Rochester, N. Y.
GM—F. M. Fritchman, Indiana, Pa.
EM—G. W. Brymer, " "
PA—H. C. Smith, Punxsutawney, "
EE—L. W. Householder, " "
GS—I. J. Harvey, .. Helvetia,

SCO—Jefferson Supply Co., Mgr., D. H. McIntyre, Punxsutawney, Pa.
Sales Mgr. Geo. L. Eaton, Rochester, N. Y.

Soldier Run and Trout Run Mines, Shaft, Slope and Drifts, L. Freeport Seam.
PO—Soldier, Pa. SP—Reynoldsville, Pa. CTY—Jefferson. RR—B. R. & P.
MS—J. S. Hammond, Reynoldsville, Pa.
S of H—19 elec., 2 steam locos. and rope.
S of M—92 comp. air machines.
PP—42 return tubular boilers, total 5,750 H. P., 12 compressors and 25 pumps.
EMP—968.

Jacksonville Mines, Drift and Shafts, Lower and Upper Freeport Seams.
PO—McIntyre, Pa. SP—Same and Aultman, Pa.; CTY—Indiana; RR—B. R. & P.
MS—M. Maloney........McIntyre, Pa.
S of H—15 elec. locos.
S of M—14 elec. mach.
PP—3 Compressors and 6 pumps.
EMP—517.

Aultman Mine; Drifts; 3 and 4, "E" Upper Freeport Seams.
PO—Aultman, Pa.; SP—Same; CTY—Indiana; RR—B. R. & P., Ridge branch.
MS—Thos. D. Thomas....Aultman, Pa.
S of H—7 elec. loco.
S of M—11 elec. mach.
PP—Buy power. 11 pumps.

Ernest Mines, Drift and shaft, Upper Freeport Seam.
PO—Ernest, Pa. SP—Same. CTY—Indiana; RR—B. R. & P.
MS—S. T. Oldham........Ernest, Pa.
Fulton Run Shaft.
MS—W. M. Donner........Ernest, Pa.
Cummings Shaft.
MS—S. T. McMillan.......Ernest, Pa.
S of H—29 elec. locos.
S of M—33 elec. mach. chines.
PP—24 boilers, total 5,415 H. P., 7 compressors and 14 pumps.
EMP—896.

JENKINS COAL CO.

No. 1 Mine, Drift Mine.
"E" Seam, 32 to 40 in thick.
PO—Blossburg, Pa.; SP—Same; CTY—Tioga RR—N. Y. C. Tioga Br.,
PR—W. Scott Jenkins...Blossburg, Pa
TR—Scott Jenkins........Blossburg, Pa.
PA—Scott Jenkins, " "
CE—Scott Jenkins, " "
MS—Robt. English, " "
SCO—Address the Company.
S of H—Mules. Track gauge 29 1-2
S of M—Hand.
EMP—60. Last fiscal year output 30,000 tons.
Sales Agent, Scott Jenkins, Blossburg, Pa.

JENNER-QUEMAHONING COAL CO.

Jerome No. 1 & 2 Mines; Shafts; C Prime and Upper Kittanning Seams; 60 in. thick.
PO—Jerome, Pa.; SP—Same; CTY—Somerset; RR—B. & O.
PR—T. W. Guthrie, Oliver Bldg., Pittsburgh, Pa.
TR—A. C. Robinson, Oliver Bldg., Pittsburgh, Pa.
GS—E. L. Morris, " "
PA—J. I. Boyd, " "
EM—H. M. Schmidt, " "
MM—Edw. Winning, " "
MS—A. A. Allan.........Jerome, Pa.
SM—Chas. Traux, " "
SCO—Penn Mercantile Co. Buyer H. D. Bittner, Pittsburgh, Pa.
S of H—18 elec. locos.
S of M—23 elec. mach.
PP—12 Horizontal water tube boilers, total 1800 H. P., 4 gen. units, 250 volts D. C.
EMP—849. Last fiscal year output 929,839 tons.

JOHNETTA BRICK & COAL CO.

General Office, 2406 First Natl. Bank Building, Pittburgh, Pa.
Johnetta No. 2 Mine, Shaft.
PO—Johnetta, Pa., CTY—Armstrong.
PR—J. E. Stewart......Pittsburgh, Pa.
TR—D. C. Eaton, " "
GM—J. E. Stewart, " "
PA—J. E. Stewart, " "
CE—M. D. Gibson, " "
EM—M. D. Gibson, " "
SCO—White Rock Supply Co., Buyer, M. F. McDermott, Pgh., Pa.
S of H—9 Elec. loco.
S of M—3 Elec. mach.
PP—3 boilers total 450 H.P.; 1 gen. unit; 1 air comp. and 1 pump.
EMP—83. Last fiscal year output 81,636 tons.
Formerly United States Sewer Pipe Co.

JOHNSON FUEL CO.

General Office, Uniontown. Pa.
Percy Mine; Slope; Seam 66 to 72 in. thick.
PO—Percy, Pa.; SP—Same; CTY—Fayette; RR—B. & O.
PR—C. W. Johnson, ..Uniontown, Pa.
GM—C. W. Johnson, " "
PA—C. W. Johnson, " "
TR—D. J. Johnson, " "
MS—I. O. Stirling, " "
CE—Harry Gans, " "
S of H—Elec. loco. and rope.
S of M—Hand.
PP—Power purchased.
EMP—16. Coke Ovens, 32 Bee Hive.
Last fiscal year output 32,220 tons.

JONES, B. F.

Jones Mine; Bear Creek Seam; 38 to 48 in thick.
PO—Blossburg, Pa.; SP—Same; CTY—Tioga; RR—Erie.
PR—B. F. Jones.......Blossburg, Pa.
TR—B. F. Jones, " "
GM—B. F. Jones, " "
GS—B. F. Jones, " "
PA—B. F. Jones, " "
S of H—Mules.
S of M—Hand.
EMP—8. Last fiscal year output 3,800 tons.
Note—Formerly the Jones Hill Coal Co.

JUNIATA COAL CO.
General Office, Alexandria, Pa.
PR—John Phillips.....Alexandria, Pa.
TR—John Phillips, " "
GM—John Phillip, " "
GS—A. P. Hite...........Lilly, Pa.
MS—Fred George.........Portage, Pa.
CE—J. C. Sullivan........Altoona, Pa.
EM—J. C. Sillyman, " "
EE—Edward Bradley........Lilly, Pa.

Juniata Mine No. 1; Drift and Slope; Rider Seam; 46 in. thick.
PO—Lilly, Pa.; SP—Cassandra; CTY—Cambria; RR—Penna., Bens Creek branch.
S of H—Mules, rope and elec. hoist. Track gauge 36 in.
S of M—Hand.
EMP—60. Last fiscal year output 40,730 tons.

Juniata Mine No. 3, Slope and Drift, Rider Seam, 46 in. thick.
PO—Lilly, Pa.; SP—Cassandra; CTY—Cambria; RR—Penna., Bens Creek branch.
MS—John Kline..........Portage, Pa.
S of H—Mules, rope and 1 steam loco. Track gauge 36 in.
S of M—Hand.
PP—2 boilers.
EMP—20. Last fiscal year output 15,550 tons.
Sales agent, Geo. Henderson, Philadelphia, Pa.

KATO COAL CO.
Kato No. 5 Mine; B Seam, 42 to 60 in. thick.
PO—Kato, Pa.; SP—Same; CTY—Centre; RR—N. Y. C & H. R. R.
PR—Thomas F. Kelley, ...Kato, Pa.
GM—Thomas F. Kelley " "
PA—Thomas F. Kelley, " "
TR—I. B. Norris, " "
SCO—I. B. Norris. Buyer, A. G. Langton, Kato, Pa.
S of H—Mules and 2 elec. loco. Track gauge 36 in.
S of M—Hand and 1 elec. mach.
PP—Buy power.
EMP—175. Last fiscal year output 115,000 tons.

KELLEY BROS. COAL CO.
Vulcan Nos. 1, 2, and 3; Cherry Run No. 3, Big Sandy No. 4, Olanta, Meyer Run and Tunnel Mines; Drifts; D, E, B, and A Seams, 36 to 60 ins. thick.
PO—Snow Shoe, Pa. SP—Same. CTY—Center. RR—P. R. R., N. Y. C.
PR—H. P. Kelley......Snow Shoe, Pa.
TR—H. P. Kelley, " "
GM—M. D. Kelley, ..Snow Shoe, Pa.
MS—L. M. Kelley, " "
MS—J. J. Morgan, " "
PA—John P. Kelley, " "
EM—Logan M. Kelly, " "
EE—A. A. Hunt, " "
SCO—Kelley Bros. Supply Co. Buyer, Thos. F. Kelley, Snow Shoe, Pa.
S of H—Mules, 1 Steam and 1 Gasoline and 3 elec. locos. Track gauge 36 in.
S of M—6 elec. mach.
PP—2 return tubular boilers, total 150 H. P., 2 gen. units D. C., 15 pumps. Purchase power.
EMP—393. Last fiscal year output 273,435 tons.

KENNERLY, J. BLAIR
General Office, 1210 Penn Square Bldg., Phila., Pa.
Kennerly Smokeless No. 1 Mine; Drift; "C" Prime or Upper Kittanning Seam; 48 to 72 in. thick.
PO—Beachly, Pa.; SP—Anspach, Pa.; CTY—Somerset; RR—B. & O., Whites Creek Branch.
PA—J. Blair Kennerly, Philadelphia, Pa.
MS—Wm. R. Jones,......Beachly, Pa.
EM—Frank B. Fluck,....Somerset, Pa.
EE—Chas. Kimmel.......Beachly, Pa.
S of H—Gravity, rope, and two 6 ton elec. locos. Track gauge 42 in.
S of M—Hand and 1 elec. chain mach.
PP—2 Erie City water tube boilers, 250 H. P., 250 volts D. C.
EMP—100. Daily output, 300 tons.
Sales Mgr., J. Blair Kennerly, Phila., Pa.
Note—Expect to develop 800 tons daily soon.

KERR COAL CO.
Kerr Mine, Drift, Upper Freeport Seam, 3 to 4 ft. thick.
PO—Freeport, Pa.; SP—Butler Junction, Pa., CTY—Armstrong.
RR—P.R.R., Conemaugh Div.
PR—Isaac Guckenheimer... Pgh., Pa.
TR—A. L. Strouse......Freeport, Pa.
PA—R. A. Stein, " "
GM—R. A. Steim, " "
MS—John Frazier, " "
CE—Edwin Taylor.
EE—R. H. Kerner, " "
S of H—3 Elec. loco.
S of M—6 Elec. machines.
PP—2 Return tubular boilers, total 300 H. P., 1 Gen. unit, 250 volts D. C., 1 pump.
EMP—85. Last fiscal year output 97,000 tons.
Sales Agent, R. A. Steim.

KETTLE CREEK COAL MINING CO.
General Office, Williamsport, Pa.
Kettle Creek Nos. 2, 5, 6 and 8 Mines; Drift; "B" Seam 5 to 7 ft. thick.
PO—Bitumen, Pa.; SP—Cooks Run, Pa. CTY—Clinton. RR—P.R.R., Erie Div.
PR—G. D. Tinsman..Williamsport, Pa.
GM—Wm. H. Miller......Bitumen, Pa.
CE—Wm. H. Miller, " "
PA—Harry G. From, " "
MS—Harry G. From, " "
SCO—Bitumen Supply Co., Buyer J. E. Fillinger, Bitumen, Pa.
S of H—10 Elec. loco.; track gauge 36 in.
S of M—3 Elec. mach. and hand.
PP—2 Keeler return tubular boilers, total 300 H. P., 2 gen. units 500 volts D. C., 4 pumps.
EMP—400.

KEYSTONE COAL & COKE CO.
General Office, Huff Bldg., Greensburg, Pa.
PR—Richard Coulter....Greensburg, Pa.
VP—J. B. Huff. " "
VP—R. K. Cassatt....Philadelphia, Pa.
PA—F. B. Miller.....Greensburg, Pa.
ASST PA—R. P. Kilgore, " "
TR—F. B. Miller, " "
GM—H. F. Bovard, " "
GS—H. F. Bovard, " "
EM—G. W. Hutchinson..Greensburg, Pa.
EE—G. W. Hutchinson, " "
CE—Randolph Means Co., Pittsburgh, Pa.
MM—James Wilson........Darragh, Pa.

Arona Mine; Slope; Pittsburg Seam; 76 to 85 in. thick.
PO—Darragh, Pa.; SP—Madison Station; CTY—Westmoreland; RR—Penna., Hempfield Br.
MS—Chas. Daily........Darragh, Pa.
S of H—Mules and 2 elec: locos.
S of M—Hand.
PP—2 return tubular boilers, total 250 H. P., 4 gen. units.
EMP—176. Last fiscal year output 148,988 tons.

Carbon Mine; Slope; Pittsburgh Seam, 80 to 85 in. thick.
PO—Greensburg, Pa.; SP—Same; CTY—Westmoreland; RR—P. R. R., Radebaugh Br.
MS—Henry Welty......Greensburg, Pa.
S of H—2 comp. air loco., mules and rope; track gauge 40 in.
S of M—Hand.
PP—4 Return tubular boilers, total 475 H. P., 8 gen. units, 5 air comp., and 3 pumps.
EMP—168. Last fiscal year output 218,554 tons. Coke ovens, 57 Bee Hive.

Claridge Mine; Drift; Pittsburgh Seam, 76 to 85 in. thick.
PO—Claridge, Pa.; SP—Same; CTY—Westmoreland; RR—P. R. R., Manor Br.
MS—G. M. Brinker.......Claridge, Pa.
S of H—Rope and mules; track gauge 40 in.
S of M—Hand.
PP—6 return tubular boilers, 775 H. P., 6 gen. units, 3 pumps.
EMP—147. Last fiscal year output 141,362 tons.

Crows Nest Mine; Drift; Pittsburg Seam; 80 to 85 in. thick.
PO—Greensburg, Pa.; SP—Same; CTY—Westmoreland; RR—Penna.
MS—W. E. Henderson, Greensburg, Pa.
S of H—Rope, mules, 5 elec. and 1 steam loco.
S of M—Hand.
PP—1 return tubular boiler, total 50 H. P., 1 gen. unit, 1 pump. Purchase power.
EMP—466. Last fiscal year output 706,437 tons.

Keystone Mine; Shaft; Pittsburgh Seam, 76 to 85 in. thick.
PO—Darragh, Pa.; SP—Madison Station, Pa.; CTY—Westmoreland; RR—P. R. R., Hempfield Br.
MS—H. T. Knight........Darragh, Pa.
S of H—5 elec. and 1 gasoline loco., mules and rope. Track gauge 40 in.
S of M—Hand and 12 elec. mach.
PP—3 return tubular boilers, total 900 H. P., 4 gen. units, 4 pumps Purchase power.
EMP—456. Last fiscal year output 438,575 tons.

Greensburg No. 1 Mine; Slope; Pittsburgh Seam 80 to 85 in. thick.
PO—Greensburg, Pa.; SP—Same; CTY—Westmoreland; RR—P. R. R., Southwest Br.
MS—A. W. White.......Greensburg, Pa.
S of H—2 Elec. loco., rope and mules; track gauge 40 in.
S of M—2 elec. mach.
PP—3 return tubular boilers, 325 H. P., 1 gen. unit, 1 pump. Purchase power.
EMP—60. Last fiscal year output 69,774 tons.

Greensburg No. 2 Mine; Slope; Pittsburgh Seam, 80 to 85 in. thick.
PO—Greensburg, Pa.; SP—Same; CTY—Westmoreland; RR—P. R. R., Southwest Br.
MS—H. H. Null........Greensburg, Pa.
S of H—Rope, 2 comp. air and mules. Track gauge 40 in.
S of M—Hand and 5 Comp. air mach.
PP—4 return tubular boilers, total 500 H. P., 4 pumps, 2 compressors, 1 gen. unit.
EMP—141. Last fiscal year output 209,762 tons.
Greensburg No. 3 Mine; Slope; Pittsburgh Seam, 80 to 85 in. thick.
PO—Greensburg, Pa.; SP—Same; CTY—Westmoreland; RR—P. R. R., Radebaugh Br.
MS—A. W. White......Greensburg, Pa.
S of H—Mules. Track gauge 40 in.
S of M—Hand.
PP—1 return tubular boiler, total 100 H. P., 3 gen. unit. and 1 pump.
EMP—109. Last fiscal year output 145,000 tons.

Greensburg No. 4 Mine; Slope; Freeport Seam; 60 to 66 in. thick.
PO—Hunker, Pa.; SP—Same; CTY—Westmoreland; RR—Penna., Southwest Br.
MS—R. W. Sterrett.......Hunker, Pa.
S of H—Mules and elec. loco.
S of M—Hand.
PP—1 pump. Purchase power.
EMP—60. Last fiscal year output 85,000 tons.

Hempfield No. 1 Mine; Drift; Pittsburgh Seam; 80 to 85 in. thick.
PO—Greensburg, Pa.; SP—Same; CTY—Westmoreland; RR Pennsylvania.
MS—W. E. Henderson, Greensburg, Pa.
S of H—Rope, mules and 1 elec. loco.
S of M—Hand.
PP—10 return tubular boilers, total 1125 H. P., 16 gen. units, 5 pumps. Purchase power.
EMP—165. Last fiscal year output 218,356 tons.

Hempfield No. 3 Mine; Drift; Pittsburgh Seam; 80 to 85 in. thick.
PO—Greensburg, Pa.; SP—Same; CTY—Westmoreland; RR Pennsylvania.
MS—W. E. Henderson, Greensburg, Pa.
S of H—Mules.
S of M—Hand.
EMP—8. Last fiscal year output 12,570 tons.

Huron Mine; Drift; Pittsburgh Seam, 80 to 85 in. thick. Operate washery.
PO—New Alexandria, Pa.; SP—Allsworth, Pa. CTY—Westmoreland; RR—P. R. R., New Alexandria Br.
MS—Wm. Goodfellow,
New Alexandria, Pa.
S of H—Mules, rope and 2 electric loco. Track gauge 40 in.
S of M—Hand.
PP—2 return tubular boilers, total 500 H. P., 6 gen. units, 1 air comp., 1 pump.
EMP—169. Last fiscal year output 213,391 tons Coke ovens, 100 rectangular.

Madison Mine; Slope; Pittsburgh Seam; 76 to 80 in. thick.
PO—Darragh, Pa.; SP—Madison Station, Pa.; CTY—Westmoreland; RR—Penna., Hempfield Br.
MS—Chas. Daily.........Darragh, Pa.
S of H—Rope and mules.
S of M—Hand.
PP—1 return tubular boiler, total 100 H. P., 2 gen. units.
EMP—60. Last fiscal year output 62,343 tons.

Salem Mine; Slope; Pittsburgh Seam; 80 to 85 in. thick. Operate washery.
PO—New Alexandria, Pa. SP—Allsworth, Station; CTY—Westmoreland; RR—Penna., New Alexandria Br.
MS—Wm. Goodfellow,
New Alexandria, Pa.
S of H—Mules, rope, 8 comp. air and 1 steam loco. Track gauge 40 in.
PP—8 return tubular boilers, total 2400 H. P., 16 gen. units, 6 air comp., 7 pumps.
EMP—425. Last fiscal year output 461,877 tons. 282 Bee Hive coke ovens.

Seaboard Mine; Shaft; Pittsburgh Seam, 80 to 85 in. thick.
PO—Greensburg, Pa.; SP—Same; CTY—Westmoreland; RR—P. R. R.,Radebaugh Br.
MS—Henry Welty......Greensburg, Pa.
S of H—Mules; track gauge 40 in.
S of M—Hand.
PP—6 return tubular boilers, total 1450 H. P., 4 gen. units, 6 compressors and 6 pumps.
EMP—19. Last fiscal year output 17,916 tons.

Sewickley Mine; Slope; Pittsburgh Seam, 76 to 85 in. thick.
PO—Darragh, Pa.; SP—Madison Station; CTY—Westmoreland, RR—Penna. Hempfield Br.
MS—Chas. Daily.........Darragh, Pa.
S of H—Rope, mules and 4 elec. locos.
S of M—15 comp. air mach.
PP—5 return tubular boilers, total 1250 H. P., 10 gen. units, 3 air comp., 2 pumps.
EMP—459. Last fiscal year output 424,903 tons.

KEYSTONE LIME COMPANY
General Office, Elk Lick, Pa.
Peck Mine; Drift; Pittsburgh or Big Vein Seam; 84 to 108 in. thick.
PO—Elk Lick, Pa.; SP—Niverton, Pa.; CTY—Somerset; RR—B. & O., Salisbubry Branch.
TR—J. D. Miller........Elk Lick, Pa.
GM—J. D. Miller " "
GS—J. D. Miller " "
PA—J. D. Miller " "
MS—Lewis Hauft, " "
S of H—Horses. Track gauge 42 in.
S of M—Hand.
EMP—6. Last fiscal year output 4,000 tons.

KEYSTONE MINING CO.
General Office, East Brady, Pa.
PR—Geo. E. Henry..East Brady, Pa.
GM—Geo. E. Henry, " "
GS—Geo. E. Henry, " "
PA—Geo. E. Henry, " "
TR—Chas. C. Henry, " "
EM—S. T. Mortimore, Lawsonham, Pa.
MM—J. S. Steel....East Brady, Pa.
Sales Agent, George E. Henry, East Brady, Pa.

Sarah Furnace No. 1 Mine; Drift, L. Kittanning Seam 4ft. thick.
PO—East Brady, Pa.; SP—Keystone Store, Pa.; CTY—Clarion.
RR—P.R.R.
MS—Peter Henry......East Brady, Pa.
S of H—1 Elec. loco. and mules, track gauge 36 in.
S of M—5 Elec. mach.
PP—2 Return tubular boilers, total 300 H. P., 1 gen. unit 100 K. W., 250 volts D. C., 1 compressor and 3 pumps.
EMP—105. Last fiscal year output 102,131 tons.

Sterling No. 3 Mine, Drift, L. Kittanning Seam 44-48 in. thick.
PO—East Brady, Pa.; SP—Lawsonham, Pa., CTY—Clarion.
RR—P.R.R.
MS—Peter Henry......East Brady, Pa.
S of H—1 Elec. loco. and mules, track gauge 32 in.
S of M—4 Elec. mach.
PP—Gas engine 150 H.P., 1 gen. unit 100 K. W., 250 D C., 1 pump.
EMP—110. Last fiscal year output 83,166 tons.

KIER FIRE BRICK COMPANY.
Salina Mine; Drift; Upper Freeport Seam; 36 to 60 in. thick.
PO—Salina, Pa; SP—Same; CTY—Westmoreland; RR—Penna., Conemaugh Division.
PR—S. M. Kier, ...Salina, Pa.
GM—S. M. Kier, " "
PA—S. M. Kier, " "
TR—P. S. Kier, " "
GS—H. W. Whitesell, " "
MS—Wm. Larimer. " "
S of H—Mules. Track gauge 30 in.
S of M—Hand.
PP—Purchase power.
EMP—9. Last fiscal year output, 15000 tons.
Note—Consume output in Brick plant.

KISKIMENTAS COAL CO.
General Office, Blairsville, Pa.
PR—T. L. Eyre.....West Chester, Pa.
TR—W. P. Graff.......Blairsville, Pa.
GM—F. M. Graff, " "
PA—F. M. Graff, " "
GS—Ernest Fletcher......Saltsburg, Pa.
CE—Albert Smith ......Saltsburg, Pa.
MM—Chancy Shipley " "
EE—H. A. Scott, " "
SCO—Kiskimentas Supply Co., Buyer, Wm. G. Fletcher, Blairsville, Pa.
Sales Agent, Knickerbocker Fuel Co., New York, N. Y.

Tunnelton Mine; Drift; "E" Seam, 3 ft. thick.
PO—Tunnelton, Pa.; SP—Same CTY—Indiana; RR—P. R. R., Conemaugh Div.
SM—S. R. Devore......Tunnelton, Pa.
S of H—2 Elec. loco. track gauge 36 in.
S of M—7 Elec. mach.
PP—2 Erie return tubular boilers, total 300 H. P., 1-100, 1-150 K. W., 250 volts D. C., 3 pumps.
EMP—123. Last fiscal year output 61,680 tons.

Brush Valley Mine; Drift; "B" Seam 46 in. thick.
PO—Armagh, Pa.; SP—Scott Glen, Pa.; CTY—Indiana. RR—P. R. R., Clearfield & Cresson Div
SM—M. J. Guldin........Armaugh, Pa.
S of H—3 Elec. loco.; track gauge 42 in.

S of M—Hand.
PP—2 Erie Return tubular boilers, 300 H. P., 2 gen. units, 150 K. W., 250 volts D. C., 6 pumps.
EMP—140. Last fiscal year output 117,601 tons.

KLINE, F. A. COAL CO.
Carrolltown, Pa. No report.

KNICKERBOCKER SMOKELESS COAL CO.
PR—F. M. Graff......Blairsville, Pa.
TR—W. P. Graff, " "
GM—Telford Lewis....Hooversville, Pa.
PA—Telford Lewis, " "
GS—Norman Lewis, " "
EM—R. A. Suppes, " "
MM—W. E. Nevling, " "
EE—W. E. Nevling, " "
SCO—Hooversville Supply Co.
Buyer, C. L. Stewart, Hooversville, Pa.
Sales Agent, Knickerbocker Fuel Co., New York.

Knickerbocker No. 2, Drift, "B" Seam, 3 to 4 1-2 ft. thick.
PO—Hooversville, Pa., SP—Same, CTY—Somerset.
RR—Rockwood Branch, B & O.
MS—Norman Lewis...Hooversville, Pa.
S of H—3 Eec. loco., track gauge, 42 in.
S of M—Hand, and 3 elec. machines.
EMP—165. Last fiscal year output 173,076 tons.

Knickerbocker No. 3, Drift, "B" Seam, 3 to 4 1-2 ft. thick.
PO—Hooversville, Pa., SP—Same, CTY—Somerset.
RR—Rockwood Branch, B & O.
S of H—3 Elec. loco., track gauge 36 in.
S of M—Hand, and 1 elec. machine.
EMP—172. Last fiscal year output 157,221 tons.

KNOXDALE COAL & COKE CO.
Campbell Mine; Drift; Freeport Seam, 72 in. thick.
PO—Brookville, Pa.; SP—Knoxdale, Pa.; CTY—Jefferson; RR—P. S. & N.
PR—Dr. J. G. Steiner....Knoxdale, Pa.
TR—Joseph B. Henderson, Brookville, Pa.
GM—Ira J. Campbell, " "
PA—Ira J. Campbell, " "
S of H—Mules; track gauge 42 in.
S of M—Hand.
EMP—35. Last fiscal year output 45,600 tons.

KRAMER COAL CO.
Connellsville, Pa. No report.

LaBELLE COKE CO.
General Office, Steubenville, O.
LaBelle Mine, Drift, Connellsville Seam, 9 ft. thick, operate washery.
PO—LaBelle Pa.; SP—Same; CTY—Fayette. RR—Monongahela.
PR—R. C. Kirk........Steubenville, O.
TR—D. A. Burt, " "
GM—G. B. LaVan, " "
GS—R. W. McCasland, " "
PA—R. M. Rice, " "
EM—J. C. Gibson......Steubenville, O.
MM—Lynn Ridenour, " "
MS—Alex. Peterson ......LaBelle, Pa.
SM—J. H. Johnson " "
SCO—Luzerne Merc. Co., Steubenville, O.; Buyer, R. M. Rice, Steubenville, O.
S of H—Mules and 2 Elec. loco., track gauge 44 in.
S of M—6 Elec. mach. and hand.
PP—2 Scotch Marine water tube boilers, total 400 H. P., 2 gen. units, 250 volts, D. C., 1 Pump.
EMP—200. Coke ovens, 200 Bee Hive.

LACKAWANNA COAL & COKE CO.
General Office, Lackawanna, N. Y.
No. 3 Mine; Shaft; Miller B Seam, 3 ft. 10 in. thick. Operate washery.
PO—Wehrum, Pa. SP—Same. CTY—, Indiana. RR—P. R. R., Cresson Division.
PR—E. A. S. Clark. No. 2 Rector St. New York, N. Y.
TR—J. P. Higginson, Lackawanna, NY.
VP—C. H. McCullough, Jr. " "
GM—C. H. McCullough, Jr. " "
PA—F. H. Burnett, " "
EM—W. A. James, " "
FS—W. A. Luce. Farmers Bank Bldg., Pittsburgh, Pa.
SCO—Wehrum Supply Co. Buyer, J. W. Hugus, Ellsworth, Pa.
MS—F. B. Dunbar, ... Wehrum, Pa.
SM—W. H. Beck, " "
S of H—10 elec. locos. Track gauge 36 in.
S of M—Hand and 11 elec. and 44 comp. air machines.
PP—8 Cahall and 1 Rust water tube boilers, total 2,400 H. P., 4 gen. units, 2200 volts, 3 phase, 60 cycles, 250 volts D. C., 2 pumps, 1 compressor.
EMP—200. Last fiscal year output 102,700 tons.

LACOLLE COAL CO.
Lacolle Mine No. 1, Drift, Upper Freeport or "E" Seam 48 to 62 in.
PO—Bolivar, Pa.; SP—Same; CTY—Westmoreland.
RR—P.R.R.
PR—H. S. Ackerman..Greensburg, Pa.
TR—Albert H. Bell, " "
GM—Wm. S. Byers......Boliver, Pa.
PA—Wm. S. Byers, " "
GS—John MacPherson, " "
S of H—2Jeffrey loco.; track gauge 42 in.
S of M—Hand and Elec. Mach.
PP—2 Return Tabular Boilers, total 300 H. P., 1 Gen. Unit, 250 D. C. volts.
(Old information.)

LADYSMITH COAL MINING CO.
PO—Houtzdale, Pa.; CTY—Clearfield; RR—P. R. R.
PR—Harry Boulton......Houtzdale, Pa.
GM—Harry Boulton, " "
TR—John Benson, " "
S of H—Elec .loco.
PP—Power purchased.

LAKE SHORE GAS COAL CO.
PR—C. H. Wisser....McKeesport, Pa.
TR—C. H. Wisser, " "
GM—F. R. Wisser....Buena Vista, Pa.
GS—F. R. Wisser, " "
PA—F. R. Wisser, " "
MM—F. R. Wisser, " "
EM—J. R. Romine..McKeesport, Pa.

Dravo Mine, Drift, Pittsburgh, Seam, 5½ to 6½ ft. thick.
PO—Buena Vista, Pa.; SP—Dravo Station, Pa.; CTY—Allegheny; RR—P. & L.E. RR.
S of H—Mules and 1 elec. loco.; track gauge 44 in.
S of M—2 Elec. machines.
PP—1 Erie Return Tubular Boiler, 100 H. P., 1 Ridgway M. G. Set—150 K. W.—500 volts D. C.
EMP—52. Last fiscal year output 52,000 tons.

LAKE TRADE COAL MINING CO.
Lake Trade Mine; Drift; Brookville Seam; 42 to 48 in. thick.
PO—Hilliards, Pa; SP—Argentine, Pa. CTY—Butler. RR—Bessemer.
PR—Harry J. Filer, ... Sharon, Pa.
GM—Harry J. Filer, " "
GS—Harry J. Filer, Jr. Hilliards, Pa.
PA—Harry J. Filer, Jr. Hilliards, Pa.
TR—John Tochier, Windber, Pa.
MS—John Shuttleworth, R. F. D. 52 Hilliards, Pa.
S of H—2 elec. locos.
S of M—2 elec machs.
PP—1 Gas Engine total 165 H. P. 1 pump.
EMP—61.

LANE COAL CO. INC.
Lane Colliery No. 5; Drift; D Seam, 54 in. thick.
PO—Philipsburg, Pa.; SP—Munsons, Pa.; CTY—Center; RR—N. Y. C. & H.R.
GM—H. W. Todd, ..Philipsburg, Pa.
PA—H. W. Todd, " "
MS—Daniel Milsom.......Allport, Pa.
S of H—Mules.
S of M—Hand.
EMP—25. Last fiscal year output 5,000 tons.

Leader Mine; Slope; B Seam; 39 ins. thick; PO—Phillipsburg; SP—Munsons, Pa.; CTY—Centre; RR—N. Y. C.
S of H—Rope and steam loco.
S of M—Hand.
PP—1 water tube boiler. 40 H. P., 2 pumps.
EMP—25. Last fiscal year output 10,000 tons.

LANGDON, JOHN
General Office, Huntingdon, Pa.
PR—John Langdon....Huntingdon, Pa.
TR—John Langdon, " "
GM—Chester J. Langdon, Hopewell, Pa.
GS—Chester J. Langdon " "
PA—Chester J. Langdon, " "
EM—Chester J. Langdon, " "
SCO—Glendale Supply Co. Buyer, Wm. Barnett, Hopewell & Six Mile Run, Pa.

Cambria No. 1 and Chevington No. 3, Drift; Barnett Twin Seam, 30 to 36 in. thick.
PO—Hopewell, Pa.; SP—Same; CTY—Bedford; RR—H. & B.T.M.; Sandy Run Branch.
MS—Thos. Christopher...Hopewell, Pa.
S of H—Mules; track gauge 38 in.
S of M—Hand.
EMP—15. Last fiscal year output 10,376 tons.

Glendale Nos. 1 and 2 Mines, Drift and Slope; Barnett Seam, 30 to 36 in. thick.
PO—Hopewell Pa.; SP—Same; CTY—Bedford; RR—H. & B. T. M., Sandy Run Branch.
MS—Thos. Christopher...Hopewell, Pa.
S of H—Mules and rope; track gauge 38 in.
S of M—Hand.
PP—1 Return tubular boiler, 60 H. P., and 1 pump.
EMP—6. Last fiscal year output 3,656 tons.

Cambria No. 2 Mine, Slope, Kelly Seam, 3 to 5 ft. thick.
PO—Hopewell, Pa.; SP—Same; CTY—Bedford; RR—H. & B. T. M., Sandy Run Branch.
MS—John Himes........Hopewell, Pa.
S of H—Mules and rope. Track gauge 38 in.
S of M—Hand.
PP—1 Boiler, 80 H. P., 3 engines, 1 pump.
EMP—91. Last fiscal year output 58,989 tons.

Glendale Nos. 3 and 4 Mines; Slopes; Kelly and Barnett Seams, 30 to 60 in thick.
PO—Six Mile Run, Pa.; SP—Coaldale; Pa.; CTY—Bedford; RR—H. & B. T.M., Six Mile Run Branch.
MS—Harry Swesner, Six Mile Run, Pa.
S of H—Mules and rope; track gauge 38 in.
S of M—Hand.
PP—2 Return tubular boilers, total 140 H.P., 3 engines, 1 pump.
EMP—25. Last fiscal year output 11,025 tons.

Chevington No. 4 Mine, Drift, Kelly Seam, 3½ to 5 ft. thick.
PO—Hopewell, Pa.: SP—Same: CTY—Bedford; RR—H. & B.T.M., Sandy Run Branch.
MS—John Himes........Hopewell, Pa.
S of H—Mules and gravity; track gauge 38 in.
S of M—Hand.
EMP—8. Last fiscal year output 3,337 tons.

LANDSBERRY COAL CO.
Landsberry Nos. 2 and 3 Mines; Drifts; "A" Seam, 48 to 60 in. thick.
PO—Woodland, Pa.; SP—Same; CTY—Clearfield. RR—N. Y. C.
GM—A. B. Landsberry....Woodland, Pa.
GS—A. B. Landsberry, " "
PA—A. B. Landsberry, " "
MS—J. Fred. Herbert, " "
SCO—Bradford Supply Co., Buyer A. B. Lansberry, Woodland, Pa.
S of H—1 Elec. and 1 Steam loco.; track gauge 36 in.
S of M—Hand.
PP—2 Water tube boilers.
EMP—25. Last fiscal year output 16,000 tons.
Sales Agent, Hatfield & Hilles, Altoona, Pa.

LATROBE COAL CO.
General Office, Altoona, Pa.
PR—Col Richard Coulter..Greensburg, Pa.
TR—John Lloyd..........Altoona, Pa.
GM—John Lloyd, " "
EM—J. S. Sillyman & Co., Altoona, Pa.
SCO—Henrietta Supply Co. Buyer, W. D. Canan, Altoona, Pa.

Latrobe No. 1 Mine, Slope, Pgh. Seam. 84 to 90 in. thick.
PO—Latrobe, Pa. SP—Same. CTY—Westmoreland. RR—P. R. R.
MS—D. W. Jones, ... Latrobe, Pa.
S of H—1 steam loco.
S of M—Hand.
PP—3 return tubular boilers, total 210 H. P.
EMP—140. Last fiscal year output 133,628 tons.

Latrobe No. 2 Mine, Slope, Pgh. Seam. 66 to 84 in. thick.
PO—Blairsville, Pa. SP—Hillside, Pa. CTY—Indiana. RR—P. R. R.
MS—D. W. Jones, ... Latrobe, Pa.
S of H—Rope and mules.
S of M—Hand and elec. mach.
PP—5 Return tubular boilers, total 600 H. P., 2 pumps.
EMP—176. Last fiscal year output 182,759 tons.

LATROBE CONNELLSVILLE COAL & COKE CO.
General Office, Greensburg, Pa.
PR—J. B. Huff........Greensburg, Pa.
GM—A. N. Pershing, " "
PA—A. N. Pershing, " "
CE—Robert Morris, " "
EM—Robert Morris, " "
TR—Joseph E. Barnett.....Latrobe, Pa.
GS—Edw. Soppitt, " "

Saxman Mine, Shaft, Pittsburgh Seam, 7 to 9 ft. thick.
PO—Latrobe, Pa.; SP—Same; CTY—Westmoreland; RR—P.R.R.
MS—Henry O'Neil........Latrobe, Pa.
S of H—1 Elec. loco.; track gauge 40 in.
S of M—Pick.
PP—6 Return tubular boilers, total 420 H.P., 2 gen. units, 500 and 110 volts A.C.
EMP—150. Coke ovens, 80 Bee Hive. Last fiscal year output 113,988 tons.

Superior No. 1, Shaft, Pittsburgh Seam, 7 to 9 ft. thick.
PO—Latrobe, Pa.; SP—Same; CTY—Westmoreland; RR—P.R.R.
MS—Henry O'Neil........Latrobe, Pa.
S of M—Pick.
S of H—1 Elec. loco.; track gauge 40 in.
PP—2 Return tubular boilers, total 200 H.P., 1 gen. unit, 500 volts A.C.
Coke ovens, 71 Bee Hive. Last fiscal year output 38,841 tons.

Derry No. 1, Shaft, Pittsburgh Seam, 7 to 9 ft. thick.
PO—Bradenville, Pa.; SP—Same; CTY—Westmoreland; RR—P.R.R.
MS—W. N. Rigg.......Bradenville, Pa.
S of H—3 Elec. loco.; track gauge 40 in.
S of M—Pick.
PP—6 Return tubular boilers, total 600 H.P., 6 pumps; also buy power.
EMP—550. Last fiscal year output 259,413 tons.

Derry No. 2, Shaft, Pittsburgh Seam, 7½ ft. thick.
PO—Bradenville, Pa.; SP—Same; CTY—Westmoreland; RR—P.R.R.
MS—W. N. Rigg......Bradenville, Pa.
S of H—Mules; track gauge 40 in.
S of M—Pick.
PP—3 Return tubular boilers, total 450 H.P., 4 pumps.
50 Bee Hive coke ovens.

Connellsville Mine, Slope, Pittsburgh Seam, 7 to 9 ft. thick.
PO—Superior, Pa.; SP—Bradenville, Pa.; CTY—Westmoreland; RR—P.R.R.
MS—J. W. McDonald.....Superior, Pa.
SM—J. E. Heck..........Latrobe, Pa.
S of H—Rope and 4 gasoline motors; track gauge 40 in.
S of M—Pick.
PP—4 Return tubular boilers, total 400 H.P., 1 compressor.
EMP—550. Coke Ovens, 208 Bee Hive. Last fiscal year output 245,149 tons.

Superior No. 2, Drift, Pittsburgh Seam, 7 to 9 ft. thick.
PO—Superior, Pa.; SP—Bradenville, Pa.; CTY—Westmoreland; RR—P.R.R.
MS—J. W. McDonald.....Superior, Pa.
S of H—1 Gasoline motor; track gauge 40 in.
S of M—Pick.
EMP—100. Last fiscal year output 61,984 tons.

Millwood Mine, Shaft, Pittsburgh Seam 7 to 9 ft. thick.
PO—Blairsville, Pa.; SP—Millwood, Pa.; CTY—Westmoreland; RR—P. R. R.
MS—John Christner, R. F. D., Blairsville, Pa.
S of H—2 Comp. air loco. and mules; track gauge 40 in.
S of M—Pick and comp. air machines.
PP—1 Water tube and 5 return tubular boilers, total 700 H.P., 2 air compressors and 2 pumps.
EMP—200. Last fiscal year output 3,356 tons.

LATROBE-CRESSON COAL MINING CO.
General Office, Latrobe, Pa.
Island Mine; Shaft; Pgh. Seam, 84 to 108 in. thick.
PO—Latrobe, Pa.; SP—Same; CTY—Westmoreland; RR—P. R. R.
PR—James Quinn, ...Latrobe, Pa.
GS—James Quinn, " "
TR—M. J. Hines " "
MS—John Bush, " "
CE—W. H. Matthews, Ligonier, Pa.
S of H—Mules.
S of M—Hand.
PP—2 water tube boilers, total 95 H.P., 2 pumps.
EMP—16. Last fiscal year output 7,178 tons.

LEAP COAL MINING COMPANY.
Leap No. 1 Mine; Drift; E. Vein; 36 to 48 in. thick.
PO—Cassandra, Pa; SP—Same; CTY—Cambria; RR—Penna.
PR—E. J. Leap, ... Cassandra, Pa.
TR—E. J. Leap, " "
PA—E. J. Leap, " "
MS—E. J. Leap, " "
GM—Wm. Leap, " "
GS—Wm. Leap, " "
EM—A. B. Curry, Johnstown, Pa.
MM—M. A. Leap, Cassandra, Pa.
S of H—1 steam loco.
PP—1 Water tube boiler, total 45 H. P.
EMP—35. Last fiscal year output, 13,850 tons.

LEE, THOMAS J.
Chester Mine, Drift Mine, "B" Seam 4 ft. thick.
PO—Phillipsburg, Pa. SP—Hawk Run, Pa. CTY—Centre. RR—N. Y. C. Ophir Branch.
GM—Thos. J. Lee, Philipsburg, Pa.
GS—Thos. J. Lee, “ “
PA—Thos. J. Lee, “ “
EM—George H. Ayers, “ “
MS—Harry Crago, Jr., Philipsburg, Pa.
S of H—Rope and mules, track gauge, 3 ft.
S of M—Hand and 2 elec. mach.
PP—2 Return tubular boilers total 150 H. P.; also purchase power; 2 Cameron No. 10 pumps.
EMP—60. Last fiscal year output 60,000.

LEESBURG COAL CO (THE)
Leesburg Mine, Slope, Brookville Seam 40 to 48 in. thick.
PO—Volant, Pa., R.D.; SP—Drake, Pa.; CTY—Lawrence.
RR—P.R.R., Wolf Creek Branch.
PR—S. A. Richards....Struthers, O.
TR—J. A. Gealey....New Castle, Pa.
GM—J. A. Gealey, “ “
PA—J. A. Gealey, “ “
MS—M. F. Crawford, R. D. No. 2, Volant, Pa.
MM—Thos. Wardle........Volant, Pa.
S of H—Mules and rope.
S of M—1 comp. air mach.
PP—3 return tubular boilers, total 350 H. P., and 2 pumps, 1 air comp.
EMP 85. Last fiscal year output 48,927 tons.
Sales Agent J. A. Gealey, New Castle, Pa.

LEECHBURG COAL & COKE CO.
Riverview Mine, Drift.
PO—Leechburg, Pa. SP—Same. CTY—Armstrong. RR—P. R. R.
GM—L. W. Hicks
MS—Wm. Gilson
EM—E. A. Watters, “ “
S of H—1 elec. loco.
S of M—6 elec. and 1 comp. air machine.
PP—3 return tubular boilers, total 450 H. P., 1 gen. unit, 250 volts D. C., 1 air comp., 3 pumps.
EMP—81. Last fiscal year output 66,922 tons.

LEHIGH VALLEY COAL CO.
General Office, Wilkes-Barre, Pa.
Nos. 9, 10, 12, 13, 18, 20, 22 and 23 Mines.
CTY—Centre.
PA—L. Silvermail, 143 Liberty St., New York City.
GM—F .M. Chase....Wilkes-Barre, Pa.
GS—Thos. Thomas, “ “
EM—H. S. Moutz, “ “
MM—Paul Sterling, “ “
Efficiency Eng—John Lloyd, “ “

LELAND COAL MINING CO.
General Office, 12 Broadway, New York.
Leland Mine; Drift; "D" or Moshannon Seam
PO—Utahville, Pa.; R. F. D.; SP—Smoke Run, Pa.; RR—Penna.; CTY—Clearfield.
PR—Geo. M. Dexter, 12 Broadway, New York.
GM—Geo. M. Dexter, 12 Broadway, New York.
TR—W. H. Carpenter, 12 Broadway, New York.
PA—W. H. Carpenter, 12 Broadway, New York.
GS—Jas. J. McCann....Lloydell, Pa.
MS—Ed. Casker....Smoke Run, Pa.
S of H—Gasoline loco and mules.
S of M—Hand.
EMP—225. Last fiscal year output, 160,000 tons.
Sales Agency, Dexter & Carpenter, 12 Broadway, New York, N. Y.
Successors to Cambria Coal Mining Co.

LENOX COAL CO.
General Office, Hastings, Pa.
Lenox Mines Nos. 1 and 2, "E" and "D" Seam; 40 to 44 in. thick.
PO—Hastings, Pa.; SP—Barnesboro, Pa.; CTY—Cambria; RR—P. R. R., Susquehanna Div.
PR—John C. Cosgrove....Johnstown, Pa.
GM—John C. Cosgrove, “ “
PA—John C. Cosgrove, “ “
TR—B. R. Lloyd........Hastings, Pa.
MS—Jno. Auld........Barnesboro, Pa.
EM—Chas. Schlicher......Spangler, Pa.
EE—L. O. Gregg........Johnstown, Pa.
SM—Thos. Kerr........Barnesboro, Pa.
S of H—2 elec. loco. Track gauge 36 in.
S of M—8 elec. mach.
PP—1 gen. unit, 2300 volts A. C. Purchase power.
EMP—130. Last fiscal year output 64,000 tons.
Sales Agent, Robert C. Lea & Co., Philadelphia, Pa.

LESKIE COAL MINING CO.
Leskie No. 1 Mine; Drift; Moshannon A. Seam, 48 to 72 in. thick.
PO—Osceola Mills, Pa. SP—Same; CTY—Clearfield; RR—P. R. R.
TR—Thos. Dugan, Sr...Osceola Mills, Pa.
MS—Thos. Dugan, Sr., “ “
GM—James F. Dugan, “ “
PA—James F. Dugan, “ “
SM—James F. Dugan, “ “
S of H—Mules.
S of M—Hand.
EMP—20.
Sales Agents, Chas. W. Mills and Swayne & Co., Land Title Bldg., Philadelphia, Pa.

LIGONIER COAL CO.
Ligonier No. 2 Mine, Shaft; Pittsburgh Seam; 7 to 9 ft. thick.
PO—Derry, Pa., R. F. D.; SP—Same; CTY—Westmoreland; RR—P. R. R. Bradenville branch.
PR—M. W. Saxman......Latrobe, Pa.
GM—M. W. Saxman, “ “
TR—Jos. E. Barrett, “ “
PA—M. W. Saxman, “ “
MS—Andy Smith, R. F. D. Derry, Pa.
SCO—Victor Store Co. Buyer, Ralph Lynn, Derry, Pa.
S of H—Mules and 1 elec. loco.
S of M—Hand.
PP—3 Erie water tube boilers, total 300 H. P., 500 volts D. C., 4 pumps.
Coke ovens, 50 Bee Hive.

LIGONIER DIAMOND COAL CO.
Ligonier, Pa. No report.

LILLEY COAL & COKE CO.
Lilley Mine; Slope; Pittsburgh Seam, 96 in. thick.
PO—So. Brownsville, Pa.; SP—West Brownsville, Pa.; CTY—Fayette; RR—P. R. R., Monongahela Div.
PR—Thomas Lilley.
TR—John H. Moffitt. ..Charleroi, Pa.
GM—Thos. Elliott, So. Brownsville, Pa.
ASST GM—Fred C. Hunter, “ “
PA—Thos. Elliott, “ “
EM—Fred C. Hunter, “ “
GS—Charles Bradford, Coal Center, Pa.
MS—Harry Humphries....California, Pa.
MM—Sam Moyer, “ “
ASST EM—Albert McCorony, “ “
SCO—Bradford Supply Co. Buyer, Ernest Bradford, California, Pa.
S of H—1 Elec. loco; track gauge 44 in.
S of M—8 elec. mach.
PP—2 Wickes water tube boilers, total 500 H.P., gen. unit 250 volts D. C., 10 pumps.
EMP—300. Last fiscal year output 250,000 tons.
Sales Agency, J. B. Hillman & Sons Co., Pittsburgh, Pa.

LILLY COAL CO.
General Office, Altoona, Pa.
Lilly Mine Nos. 2 and 3; Drift and slope; B Seam, 42 to 36 in thick.
PO—Lilly, Pa.; SP—Same—CTY—Cambria.
RR—P.R.R.
Receiver, Wm. Hahman, Altoona, Pa.
GM—Wm. Hahman ......Altoona, Pa.
PA—Wm. Hahman, “ “
MS—W. E. Richards......Lilly, Pa.
SCO—Keystone Mdse. Co., Buyer H. H. Brady, Lilly, Pa.
S of H—2 Elec. loco., mules and rope; track gauge 36 in.
S of M—Hand.
PP—4 Return tubular boilers, total 600 H. P.; 2 gen. units 250 volts, D. C., 1 pump.
EMP—125. Last fiscal year output, 80,000 tons.

LINCOLN COAL CO.
General Office, 1 Broadway, New York City.
Lincoln Mine, Drift, Miller or Lower Kittanning Seam; 40 to 48 in. thick.
PO—Nant-Y-Glo, Pa., SP—Same, CTY—Cambria; RR—P. R. R., C. & C. Br.
PR—W. A. Marshall, 1 Broadway, New York.
TR—F.A. Potts, 143 Liberty St., N.Y.
GM—W. A. Marshall, 143 Liberty St., New York, N. Y.
PA—J. E. Burns....Nant-Y-1Glo., Pa.
GS—J. E. Burns, “ “
SM—E. E. Davis, “ “
S of H—4 Elec. loco., track gauge 3 ft.
S of M—9 Elec. mach.
PP—2 Return tubular boilers, total 300 H.P., 2 Gen. units, 250 volts, D. C., 1 pump.
EMP—225. Last fiscal year output, 173,622 tons.
Sales Agents, W. A. Marshall & Co. 1, Broadway, New York.

LINCOLN COAL & COKE CO.
General Office, Scottdale, Pa.
Lincoln Mine, Slope, Pgh. Seam 9 ft. thick.
PO—Waltersburg, Pa.; SP—Helen, Pa.; CTY—Fayette. RR—P. V. & C., Keister Branch.
PR—A. L. Keister......Scottdale, Pa.
TR—B.F. Keister, “ “
GM—E.L. Stoner, “ “
GS—E. L. Stoner, “ “
PA—E. L. Stoner, “ “
MS—B. B. Leichliter, Waltersburg, Pa.
MM—Calvin Lehman, “ “
CE—Geo. S. Baton & Co., Pgh., Pa.
SCO—F. O. Keister & Co, Waltersburg. Pa.; Buyer, J. W. Davis.
S of H—Mules, Rope and 2 Comp. Air and 2 steam locos., track gauge 44 in.
S of M—Hand and 5 Comp. air mach.
PP—3 Water tube and 2 return tubular boilers, total 1200 H. P., 3 gen. units, 3 compressors and 2 pumps.
EMP—400. Last fiscal year output, 336,000 tons.
Coke ovens—400 Bee Hive.

LINDSEY COAL MINING CO.
Nos. 5 and 8 mines; Drifts; Up. Freeport Seam, 3 ft. 10 in. to 7 ft. thick
PO—Punxsutawney, Pa.; SP—Same; CTY Jefferson; RR—P.R.R., Bellwood Div.
PR—A. L. Light....Punxsutawney. Pa.
TR—Jacob L. Fisher, “ “
GM—John Jacob Fisher, “ “
PA—John Jacob Fisher, “ “
MS—John Jacob Fisher, “ “
S of H—Mules; gauge of track No. 5, 36 in. and No. 8, 42 in.
S of M—6 Comp. air mach. and hand.
PP—2 Erie City, return tubular boilers, total 225 H P., 1 comp. Last fiscal year output 30,000 tons.
Sales Agent, Weston Dodson & Co., Bethlehem, Pa.
(Old information.)

LISTONBURG COAL MINING CO.
General Office, Meyersdale, Pa.
Miller Mine, Slope, C. Prime Seam.
PO—Listonburg, Pa. SP—Same. CTY—Somerset.
GM—J. W. Endsley.. Listonburg, Pa.
S of H—Rope and mules.
S of M—3 Comp. air machines.
PP—2 boilers, total 225 H. P., 1 air Compressor, 2 pumps.

LIVERIGHT, HENRY.
Reliance Mine, Drift; "B" Seam, 3 ft. 4 in. to 4½ ft. thick.
PO—Osceola Mills, Pa.; SP—Same; CTY—Clearfield. RR—P.R.R.
MS—Aaron Crain......Houtzdale, l
S of H—Mules.
S of M—Hand.
EMP—45.

LOBB & ANDREWS.
Eleanor Nos. 1 and 2 Mines; Drifts; Moshannon Seam, 36 in. thick.
PO—Brisbin, Pa.; SP—Smoke Run, Pa.; CTY—Clearfield; RR—P. R. R., Smoke Run Br.
PR—Jonathan Andrews...Houtzdale, Pa.
GS—Thomas Lobb, “ “
GM—Jonathan Andrews, “ “
MS—Thos. Wynn..........Ramey, Pa.
S of H—Mules; track gauge, 36 in.
S of M—Hand.
EMP—35. Output, 100 tons daily.
Sales Agency, Gorman-Leonard, Brisbin, Pa.

LOCHRIE BROS. COAL CO.
General Office, Windber, Pa.
Penna. No. 1 Mine, Drift.
PO—Argentine, Pa. SP—Same. CTY—Butler. RR—B. & L. E.
GM—Thos. Lochrie, .. Argentine, Pa.
PA—Thos. Lochrie, “ “
MS—T. MacTavish, “ “
S of H—Rope and mules.
S of M—6 Comp. air machines.
PP—2 return tubular boilers, total 250 H. P., 1 air comp., 2 pumps.
EMP—92. Last fiscal year output 95,000 tons.
(Old information.)

LOCHRIE, HUGH, COAL MINING CO.
PO—Hilliards, Pa.; SP—Same; CTY—Butler; RR—B. & L. E.
GM—Hugh Lochrie, ...Hilliards, Pa.
S of H—Rope and mules.
S of M—2 Comp. air mach.
PP—2 Boilers 250 H.P.; 1 compressor.
Note—Successors to the Industrial Coal Company of Pittsburgh.

LOEB, H.
General Office, 33d & Master Sts., Philadelphia, Pa.
Cherry Grove, Mine; Drift; Upper Freeport Seam 3 to 4 ft. thick.
PO—Big Run, Pa., R.F.D.No.2; SP—Winslow, Pa.; CTY—Jefferson.
RR—P.R.R.
GM—H. Loeb......Philadelphia, Pa.
GS—H. Loeb, “ “
PA—H. Loeb, “ “
S of H—Mules, track gauge 38 in.
S of M—Hand and 3 comp. air mach.
PP—1 Return tubular boiler 75 H.P.; 1 compressor.
Output 600 tons.

LOGAN COAL CO.
General Office, Harrison Bldg., Phila., Pa.
PR—Wm. J. Faux........Phila., Pa.
TR—Wm. J. Faux, “ “
GS—A. Appleyard......Beaverdale, Pa.
EM—A. B. Crichton....Johnstown, Pa.
SCO—Logan Valley Store Co., Buyer, H. W. Black, Beaverdale, Pa.

Logan No. 1 Mine, Slape; "B" Seam, 3 to 4 ft. thick.
PO—Dunlo, Pa.; SP—Same; CTY—Cambria; RR—P. R. R.
MS—P. Hart..............Dunlo, Pa.
SM—H. W. Black, “ “
S of H— Elec. loco. and rope; track gauge 36 in.
S of M—Hand.
PP—1 Return tubular, Erie boiler, 80 H. P., 2 pumps.
EMP—97; Last fiscal year output 70,000 tons.

Logan No. 7 Mine; Drift; "E" Seam, 3 ft. to 3 ft. 6 in. thick.
PO—Dunlo, Pa.; SP—Same, CTY—Cambria, RR—P. R. R.
SM—H. W. Black.........Dunlo, Pa
S of H—1 Elec. loco. and mules; track gauge 36 in.
S of M—Hand.
PP—2 Return tubular, Erie boilers, total 200 H. P., gen. unit 250 volts D. C., 1 pump
EMP—47. Last fiscal year output 35,000 tons.

Logan No. 4 Mine; Slope; "B" Seam, 3 to 4 ft. thick.
PO—Beaverdale, Pa.; SP—Lloydell, Pa.; CTY—Cambria; RR—P.R.R.
MS—Arthur Appleyard..Beaverdale, Pa.
SM—H. W. Black, “ “
S of H—2 Elec. loco. and rope; track gauge 36 in.
S of M—Hand.
PP—8 Return tubular, Erie, boilers, total 900 H. P., 3 gen. units, 250 volts D. C., 2 air comp. and 2 pumps.
EMP—271. Last fiscal year output 240,000 tons.

Logan No. 2; Drift; "E" Seam, 3 ft. to 3 ft. 8 in. thick.
PO—Beaverdale, Pa.; SP—Lloydell, Pa.; CTY—Cambria; RR—P.R.R.
S of H—2 Elec. loco.; track gauge 36 in.
S of M—1 Elec. mach. and hand.
PP—From No. 4 Mine.
EMP—132. Last fiscal year output 150,000 tons.

Logan No. 6½ Mine, Slope; "D" Seam, 44 to 50 in. thick.
PO—Beaverdale, Pa.; SP—Lloydell, Pa.; CTY—Cambria; RR—P.R.R.
SM—H. W. Black......Beaverdale, Pa.
S of H—1 Elec. loco. and rope; track gauge 36 in.
S of M—1 Elec. 1 comp. air mach. and hand.
PP—3 Return tubular, boilers, total 240 H. P., 1 comp. and 1 pump.
EMP—55. Last fiscal year output 106,000 tons.

Logan No. 8 Mine; Slope; "E" and "D" Seam, 42 in. thick.
PO—Beaverdale, Pa.; SP—Ruthford, Pa.; CTY—Cambria; RR—P. R. R., South Fork branch.
MS Arthur Appleyard...Beaverdale, Pa.
S of H—1 elec. loco.
S of M—1 elec. mach.
PP—From No. 6½ mine.
EMP—Just developing.

LOGANSPORT COAL CO.
General Office, First National Bank Bldg., Pittsburgh, Pa.
Bethel Mine; Drift; Freeport Seam, 42 in. thick.
PO—Logansport, Pa.; SP—Same; CTY—Armstrong; RR—P. R. R., B. & A. V. Div.
PR—E. J. Frauenheim, Jr., Pittsburgh, Pa.
TR—E.J.Frauenheim, Jr., “ “
PA—H. L. Stewartson, “ “
CE—John M. Rayburn, “ “
GM—R. C. McLean, Logansport, Pa.
MS—Harry Turner, “ “
S of H—1 Elec. loco.
S of M—4 Elec. mach.
PP—Power purchased.
EMP—60. Output 300 tons daily.
Sales Agency, Producers Fuel Co., Pittsburgh, Pa.

LOUISE COAL CO.
General Office, Chambersburg, Pa.
Kelly, Rock Bar and Barnett Rock Bar Mines; Slope and Drift; "C" and Barnett Seams, 24 to 60 in. thick.
PO—Defiance, Pa.; SP—Riddlesburg, Pa.; CTY—Bedford; RR—H. & B. T., Six Mile Run Branch

TR—M. C. Stoner....Chambersburg, Pa.
PA—M. C. Stoner, “ “
GM—J. F. Griffith, Broad Top City, Pa.
MS—M. V. Manley......Defiance, Pa.
EE—Oscar Whited...Six Mile Run, Pa.

(Continued on Next Page.)

Louise Coal Co.—Cont.
S of H—Mules; Track gauge 36 in.
S of M—Hand.
PP—1 gen. unit 220 volts A. C., 1 pump. Power purchased
EMP—39. Last fiscal year output 29,000 tons.

LOVE & PORTER COAL CO.
General Office, Connellsville, Pa.
Reese 'Mine; Drift; L. Kittanning Seam, 36 to 54 in. thick.
PO—Indian Head, Pa.; SP—Same; CTY—Fayette; RR—B. & O., Indian Creek Valley.
PR—Thos. Love, ...Everson, Pa.
GM—Thos. Love, " "
TR—Henry A. Porter, Connellsville, Pa.
S of H—Mules.
S of M—Hand.
Output at present 100 tons daily.

LOYAL HANNA COAL & COKE CO.
General Office, Philadelphia, Pa.
PR—John Pitcairn....Philadelphia, Pa.
VP—C. C. Watt, "" "
TR—L. V. Biggs " "
ASST GM—C. M. Watt, " "
PA—C. M. Watt, " "

Loyal Hanna Mine Nos. 1 and 2 Shaft; Pgh. Seam; 7ft. thick.
PO—Loyal Hanna, Pa.; SP—Same; CTY—Westmoreland.
RR—P.R.R.
MS—Wm. Gray......Loyal Hanna, Pa.
S of H—3 Elec. loco. and mules.
S of M—Hand.
PP—12 Return tubular boilers.

Loyal Hanna No. 3; Drift; L. Kittanning Seam 3 ft. 8 in. thick.
PO—Onnalinda, P. O., Pa.; Lloydell, Pa.; CTY—Cambria. PR—P.R.R., South Fork Branch.
MS—Joseph Patterson, Onnalinda, Pa.
S of H—5 Elec. loco. and mules track gauge 36 in.
S of M—Hand.
PP—4 Return tubular boilers.

Loyal Hanna No. 6; Drift; L. Kittanning Seam 4 ft. 2 in. thick.
PO—Cairnbrook, Pa.; SP—Same; CTY—Somerset; RR—P. R. R.
MS—Joseph Patterson, Onnalinda, Pa.
Asst. MS—Arch Miller...Cairnbrook, Pa.
S of H—Elec. loco.; track gauge 36 in.
S of M—Elec.
PP—1 Return tubular boiler, also purchased p

LOYALSOCK COAL MINING CO.
General Office, Towanda, Pa.
Loyalsock No. 1 Mine; Drift; Seam 54 to 62 in. thick.
PO—Forksville, Pa.; SP—La Porte, Pa.; CTY—Sullivan; RR—W. & N. B.
PR—Benj. Kuykendall.....Towanda, Pa.
TR—F. C. Overton. " "
GM—G.C.MacFarlane, Barnum, W.Va.
GS—Chas. Bashore......Forksville, Pa.
PA—F. C. Overton, " "
MS—Chas. Bashore. " "
S of H—Mules; track gauge 42 in.
S of M—Hand.
PP—1 Return tubular boiler.
Last fiscal year output, 2000 tons.

LUCESCO COAL CO.
General Office, Greensburg, Pa.
Lucesco Mine, Drift, Freeport Seam, 49 to 30 in. thick.
PO—Lucesco, SP—Kiskiminetas Junction, Pa., CTY—Westmoreland.
RR—Penna., Conemaugh Div.
PR—J. Howard Patton..Greensburg, Pa.
TR—L. B. Huff, " "
GS—Howard C. Patton, " "
PA—J. Howard Patton, " "
EM—Robt. Morris. " "
MS—George Weightman..Saltsburg, Pa.
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—2 Gen. units, 220 volts A. C., 3-phase, 120-cycle, 1 pump. Buy power.
EMP—78 Last fiscal year output 61,378.85 tons.
Sales Agents, Lucesco Coal Co., Greensburg, Pa.
Note—Idle at present.

LUZERNE COAL & COKE CO.
Geneal Office, Oliver Bldg., Pittsburg, Pa.
Luzerne Mine; Slope; Pgh. Seam, 62 to 98 in. thick.
PO—East Millsboro, Pa.; SP—Luzerne Siding, Pa.; CTY—Fayette; RR—Monon.
PR—H. A. Davis........Pittsburg, Pa.
TR—J. H. Hillman, Jr., " "
GM—W. L. Affelder, " "
PA—J. M. Leithead, " "
MS—R. E. Kirk, East Millsboro, Pa.
SCO—Unity Supply Co., Pittsburgh, Pa.
EM—F. E. Gebhart, Masontown, Pa.
S of H—Mules (at present); track gauge,, 42 in.
S of M—2 Elec. mach.
PP—Power purchased, gen. nuit, 440 volts A. C., 3 phase, 60 cycles.
EMP—22. Last fiscal year output 44,935 tons. Coke ovens, 34 Bee Hive.
Sales Agency, J. H. Hillman & Sons Co., Pittsburg, Pa.

LYDICK COAL CO.
Lydick Mine; Drift; B Seam; 36 to 48 in. thick.
PO—Indiana, Pa.; SP—Same; CTY—indiana; RR—P. R. R.
PR—E. I. Barry.........Indiana, Pa.
TR—F. L. Neff, " "
GM—F. L. Neff, " "
MS—Robt. Baird. " "
CE—Thos. Peelor, " "
PA—F. L. Neff..........Indiana, Pa.
S of H—Mules; track gauge 36 in.
S of M—Hand.
EMP—12. Last fiscal year output 3,643.02 tons.

LYNCH, B. J. & CO.
Moro Mine; Slope and drift; A and B Seam, 36 to 48 in. thick.
PO—Rockwood, Pa.; SP—Shamrock, Pa.; CTY—Somerset; RR—B. & O., Somerset & Cambria Br.
PR—B. J. Lynch, ...Meyersdale, Pa.
TR—B. J. Lynch, " "
PA—B. J. Lynch, " "
EM—B. J. Lynch, " "
S of H—Mules and rope.
S of M—8 Comp. air mach. and hand.
PP—2 return tubular boilers, total 300 H. P., 1 compressor, 1 pump.
EMP—26.

McANINCH & REINERT COAL CO.

Gotwold Mine; Drift; L. & Up. Kittanning Seam, 34 to 54 in. thick.
PO—Knoxdale, Pa.; SP—Same; CTY—Jefferson; RR—P. S. & N.
GM—W. J. McAninch, Knoxdale, Pa.
GS—W. J. McAninch, " "
PA—W. J. McAninch, " "
MS—Emanuel Reinert, " "
EM—A. L. Bouton, ...DuBois, Pa.
S of H—Mules.
S of M—Hand.
EMP—10. Output at present 5,000 tons.
Sales Agent, W. J. McAninch, Knoxdale, Pa.

McCLANE MINING CO.
Maud Mine, Slope, Pgh. Seam, 64 to 72 in. thick.
PO—Bridgeville, Pa.; SP—Treveskyn; CTY—Allegheny; RR—P. C. C. & St. L., B. & M Branch.
PR—M. W. McClane...Washington, Pa.
GM—M. W. McClane, " "
PA—M. W. McClane, " "
TR—Robt. L. McCarrell, Washington, Pa.
MS—A. McLean, Bridgeville, Pa.
EM—W. H. McClane....Bridgeville, Pa.
MM—Howard Phillips.......Cuddy, Pa.
EE—August Hageter, " "
SCO—Vulcan Supply Co., Buyer, F. D. McFarland, Cuddy, Pa.
S of H—Mules and 3 elec. locos. Track gauge 40 in.
S of M—12 elec. mach.
PP—Purchase Power.
EMP—250. Last fiscal year output, 208,000 tons.

McCONNEL COAL CO.
General Office, Du Bois, Pa.
PR—Frank G. St. Clair, Du Bois, Pa.
GM—Frank G. St. Clair, " "
PA—Frank G. St. Clair, " "
TR—Asst. C. C. Hammond, " "
EM—V. R. Pratt.....Reynoldsville, Pa.

Sugar Hill Mine; Drift; Up. Freeport Seam, 4½ to 5 ft. thick.
PO—Falls Creek, Pa., R.D. No. 1· SP—Sugar Hill, Pa.; RR—P. S. & N
MS—Amos Goss......Falls Creek, Pa.
S of H—1 Elec. loco. track gauge 42 in.
S of M—4 Elec. mach.
PP—2 Return tubular boilers total 90 H. P., 2 gas engines, gen. units 500 volts D. C., 2 pumps
EMP—65. Last fiscal year output 70,000 tons.

Beechton Mine; Drift: Up. Freeport Seam; 4½ to 5 ft. thick.
PO—Westville, Pa.; SP—Beechton,Pa.; CTY—Jefferson; RR—P. S. & N.
MS—John H. Kerry......Westville, Pa.
S of H—1 Elec. loco. and mules; track gauge 42 in.
S of M—4 Elec. mach.
PP—2 Return tubular boilers total 200 H. P., 1 gen. unit 500 volts D. C., 2 pumps.
EMP—65. Last fiscal year output 65,000 tons.

McCURDY, J. H. & SON.
McCurdy Mine, Slape; Brookville Seam; 48 to 58 in. thick.
PO—Jackson Center, Pa.; SP—Same; CTY—Mercer. RR—Penna. Lines, Jackson Center, Br.
PR—J. H. McCurdy..Jackson Center, Pa.
GM—J. H. McCurdy, " " "
PA—J. H. McCurdy, " " "
MS—J. H. McCurdy, " " "
S of H—Mules. Track gauge 32 in.
S of M—Hand.
PP—1 Return tubular boiler total 80 H. P.; 2 pumps.
EMP—30. Last fiscal year output 15,169 tons.

McDONALD COAL CO.
General Office House Bldg., Pgh., Pa.
Willow Grove Mine, Drift, Seam, 5 ft. thick.
PO—Sturgeon, Pa.; SP—Same; CTY—Allegheny. RR—P.C.C.&St.L. Ry.
PR—Robert Young......McDonald, Pa.
VPR—D. L. Williams, " "
TR—W. S. Lockhart, " "
PA—Messrs. Young & Green, " "
MS—Robt. Young, " "
MM—Robert Fenwick, " "
EE—Robert Fenwick, " "
S of H—Elec. loco.; track gauge 44 in.
S of M—3 Elec. mach. and hand.
PP—Power purchased, 3 pumps.
EMP—110. Coke ovens 11 Bee Hive. Last fiscal year output 70,000 tons.
Sales Agent, J. J. Greene.
(Old information.)

McDONALD, D. COAL CO.
SUPT—W. H. Shearer, Cowansville, Pa.
No report.

McFETRIDGE BROS. COAL CO.
McFetridge Mine, Drift, Lower and Upper Freeport Seam, 24 to 84 in. thick.
PO—Creighton, Pa.; SP—Same; CTY—Allegheny.
RR—P.R.R.—Conemaugh Div.
PR—Wm. McFetridge.....Creighton, Pa.
TR—G. E. McFetridge, " "
GM—G. E. McFetridge, " "
PA—G. E. McFetridge, " "
MS—James Adamson, " "
EE—A. D. Hutchinson, " "
GS—R. B. McFetridge, " "
CE—John M. Rayburn..Pittsburgh, Pa.
S of H—Mules, rope and 3 Elec. loco.; track gauge 44 in.
S of M—5 Elec. mach.
PP—2 pumps. Power purchased.
EMP—250. Last fiscal year output, 327,000 tons.

McINTYRE, JAMES M. & CO.
General Office, Six Mile Run, Pa.
GM—James McIntyre, Six Mile Run, Pa.
GS—W. B. McIntyre, " "
PA—W. B. McIntyre, " "
MS—W. B. McIntyre, " "
EM—Womelsdorff & Dunkle, Philipsburg, Pa.
SCO—Penn Trading Company. Buyer, C. V. H. Barton, Six Mile Run, Pa.

Shreeve Run Mine No. 1, Drift, Kelly Seam, 44 to 60 in. thick.
PO—Six Mile Run, Pa.; SP—Same; CTY—Bedford; RR—H. & B. T.,
S of H—Mules, rope and gravity.
PP—2 return tubular boilers. total 48 H. P.
EMP—156. Last fiscal year output 112,944 tons.

Shreeve Run Mine No. 6; Drift; Kelly Seam; 42 to 66 in. thick.
PO—Six Mile Run, Pa.; SP—Same; CTY—Bedford; RR—H. & B. T.
EMP—40. Last fiscal year output, 1,459 tons.
Note—Operations recently commenced.

Shreeve Run Mine No. 2; Drift; Barnett Seam; 32 to 48 in. thick.
PO—Six Mile Run, Pa.; SP—Same; CTY—Bedford; RR—H. & B. T.
EMP—67. Last fiscal year output 63,144 tons.

McKAIN BROS.
See Bessemer Coal Mining Co.

McKEEFREY COAL CO.
General Office, Leetonia, Pa.
Geneva Mine; Drift; Pgh. Seam,
PO—Martin, Pa.; SP—Same; CTY—Fayette. RR—Monongahela.
PR—John McKeefrey......Leetonia, O.
TR—N. J. McKeefrey, " "
GM—W. D. McKeefrey, " "
PA—James Henderson......Martin, Pa.
GS—James Henderson, " "
MS—James Henderson, " "
SCO—Geneva Supply Co. Buyer, H. H. King, Martin, Pa.
S of H—2 Elec. loco., track gauge 42 in.
S of M—Hand.
PP—4 Erie Return tubular boilers, total 600 H. P., 2 gen. units, 250 volts D. C.
EMP—200 Coke ovens, 202 Bee Hive. Last fiscal year output 105,945 tons.

McKNIGHT COAL COMPANY.
McKnight Mine, Drift, E Upper Freeport Seam 3 to 4 1-2 ft. thick.
PO—Brockwayville, Pa.; SP—Same; CTY—Jefferson; RR—P. S. & N.
PR—E. B. Henderson.
TR—B. E. Taylor, Brockwayville, Pa.
SM—B. E. Taylor, " "
GM—V. F. Taylor, " "
MS—V. F. Taylor, " "
PA—V. F. Taylor, " "
S of H—1 Elec. loco.; track gauge 36 in.
S of M—4 Elec. machines.
PP—2 Return tabular boilers, total 250 H. P., 1 gen. unit, 250 volts D. C., 4 pumps.
EMP—150. Last fiscal year output 120,000 tons.

McLEAVY, JOHN & CO.
General Office, Punxsutawney, Pa.
GM—John McLeavy..Punxsutawney, Pa.
GS—John McLeavy, " "
PA—James McLeavy, " "
MM—Lynus Grube, " "
Sales Agency, Berwind-White Coal Mng. Co.

Shaller Mine, Slope and drift, L Freeport Seam, 60 to 72 in. thick.
PO—Punxsutawney, Pa.; SP—Anita, Pa.; CTY—Jefferson.
RR—P.R.R.
MS—John Neverla, Punxsutawney, Pa., R.D. No. 1.
S of H—1Steam loco., mules and rope. Track gauge 42 in.
S of M—Hand.
PP—2 return tubular Meadville boilers, total 220 H. P., 2 air comp.
EMP—68. Last fiscal year output, 71,263 tons.

Conrad Mine; L. Freeport Seam, 30 to 60 in. thick.
PO—Punxsutawney, Pa.; SP—Anita, Pa. CTY—Jefferson.
RR—P.R.R.
MS—John Sullivan.........Anita, Pa.
S of H—Mules.
S of M—Hand.
EMP—35. Last fiscal year output 23,226 tons.

McMILLAN, CHAS. R.
Liston Mine; Drift; C. Prince Seam; 36 to 60 in. thick.
PO—Listonburg, Pa.; SP—Same; CTY—Somerset; RR—B. & O., Whites Creek branch.
S of H—Mules.
S of M—Hand.
EMP—9. Daily output, 50 tons.
Note—Successors to Somerset-Quemahoning Smokeless Coal Co.

MADEIRA-HILL COAL MINING CO.
General Office, Philadelphia, Pa.
PR—P. C. Madeira........Phila., Pa.
TR—L. C. Madeira, " "
GS—W. R. Wilburn....Philipsburg, Pa.
PA—W. R. Wilburn, " "
CE—C. O. Messenger, " "
EM—Thos. F. Morgan, " "
MM—Wm. Benner, " "
EE—W. H. Webb........Munson, Pa.
SCO—Natalie Store Co., Buyer H. E. Apple, Mahaffey, Pa.
Sales Office, Philadelphia, Pa.

Spangler Nos. 2, 3 and 4 Mines; Drifts, "D", "E" and "B" Seams; 26 to 42 in. thick.
PO—Barnesboro, Pa.; SP—Same; CTY—Cambria; RR—P.R.R.
MM—J. W. Cone......Barnesboro, Pa.
EE—J. W. Hollows, " "
MS—Ed Nicholson, " "
S of H—4 Elec. loco. and mules; track gauge 36 in.
S of M—3 Elec. mach. and hand.
PP—4 Return tubular, Phoenix, boilers. total 530 H. P., 2 gen. units, 250 volts D.. C., 1 comp. and 14 pumps.
EMP—292. Last fiscal year output 325,844 tons.

Clover Run Nos. 1 and 2 Mines, Drifts, "C" Prime and "D"; 30 to 42 in thick.
PO—Mahaffey, Pa. SP—Hillman, Pa. CTY—Clearfield. RR—P.R.R.
EE—J. E. Fredericks,....Mahaffey, Pa.
EE—J. E .Fredericks, " "
MS—W. R. Wilburn....Philipsburg, Pa.
S of H—2 Elec loco. Track gauge 36 in.
S of M—Hand; 1 elec. mach.
PP—4 Phoenix return tubular boilers, 600 H. P. 2 gen. units 250 volts D. C. 2 pumps.
EMP—176. Last fiscal year output, 88,560 tons.

Elizabeth Nos. 1 and 2 Mines, Slope; "B" Seam, 34 to 42 in. thick.
PO—Houtzdale, Pa. SP—Same. CTY—Clearfield. RR—P. R. R.
MS—(1) Sam Gallagher, Houtzdale, Pa. and (2) Geo. Charlton, Houtzdale, Pa.
S of H—Mules and rope. Track gauge 36 in.
S of M—2 Comp. air mach. and hand
PP—4 Erie return tubular boilers, 375 H. P., 2 compressors and 3 pumps.
EMP—213. Last fiscal year output, 146,526 tons.

MAGEE COKE CO.
General Office, Uniontown, Pa.
Magee Mine, Shaft, Pittsburgh Seam, 9ft. thick.
PO—Latrobe, Pa., R.F.D.No.3, SP—Mammoth, Pa., CTY—Westmoreland.
RR—P.R.R.
PR—J. W. Abraham..Uniontown, Pa.
TR—I. W. Semans, " "
GM—J. W. Abraham, " "
PA—J. W. Abraham, " "
GS—J. W. Abraham, " "
CE—F. G. Christopher, " "
MS—J. S. Conner, R.F.D., No. 3, Latrobe, Pa.
S of H—Mules; track gauge 42 inches.
S of M—Hand.
PP—Boilers, 250 H. P., 1 Pump.
EMP—46. Last fiscal year output 21,187 tons.
40 Bee Hive coke ovens.
Sales Agents, Producers Coke Co., Uniontown, Pa.

MAHER COAL & COKE CO.
No. 4 Maher Mine, Drift, Upper Freeport Seam, 46 in. thick.
PO—Leechburg, Pa. SP—Same. CTY—Armstrong; RR—P. R. R., Schenley Br.
TR—Thos. Maher, ... Pittsburgh, Pa.
GM—R. Campbell Maher..Leechburg, Pa.
GS—R. Campbell Maher, " "
PA—R. Campbell Maher, " "
EE—E. J. McTigue, " "
EM—E. A. Watters, " "
SCO—Schenley Supply Co. Buyer, Martin Weiss, Leechburg, Pa.
S of H—3 Elec. loco. Track gauge 42 in.
S of M—7 elec. mach.
PP—1 Gen. unit, 250 volts D. C.; Purchase power.
EMP—140. Last fiscal year output 15,700 tons.

MAHER & GRAFF.
Columbia Plate Glass Mine, Drift, Pgh.-Connellsville Seam, 5 to 6 ft. thick
PO—Blairsville, Pa. SP—Same. CTY—Indiana. RR—Penna.
GM—Thos. Maher, ..Pittsburgh, Pa.
GS—Thos. Maher. " "
PA—Thos. Maher. " "
MF—T. R. Wilson, ..Blairsville, Pa.
EM—Albert Smith, ... Saltsburg, "
S of H—Mules and rope. Track gauge 39 in.
S of M—Hand.
PP—Purchase power.
EMP—50. Last fiscal year output 60,000 tons.

MAHONING COAL CO.
General Office, New Bethlehem, Pa.
Ruth Mine, Drift, Up. Freeport Seam. 56 in. thick.
PO—New Bethlehem, Pa. R.D.No. 6. SP—Putneyville, Pa.; CTY—Clarion; RR—Pittsburgh, Shawmut & Northern. Main line
PR—J. C. Maurer......Ringgold, Pa.
TR—Daniel Maurer......Worthville, Pa.
GM—J. W. Sullivan..New Bethlehem, Pa.
PA—J.W.Sullivan, " "
MS—J.W.Sullivan, " "
MF—J. W. Sullivan, New Bethlehem, Pa.
CE—S. J. Mortimer..Lawsonham, Pa.
S of H—Mules, rope and gravity; track gauge, 42 in.
S of M—5 Comp. air mach.
PP—1 Meadville water tube and 2 return tubular boilers, total 375 H. P., 2 compressors, 2 pumps.
EMP—39. Last fiscal year output 13,675 tons.
Sales Agency, Shawmut Coal & Coke Co., Buffalo, N. Y.

MAHONING COKE CO.
General Office, Connellsville, Pa.
Mahoning Mine; Slope; Connellsville vein; 96 to 108 in. thick.
PO—Dunbar, Pa.; SP—Same; CTY—Fayette; RR—Penna.
PR—J. M. Grey......Connellsville, Pa.
GS—J. M. Grey, " "
TR—K. K. Kramer, " "
GM—K. K. Kramer, " "
MS—Wm. A. Ganier, " "
CE—S. M. Faust, " "
MM—John Duffy, " "
S of H—Rope.
PP—2 water tube boilers, total 180 H. P.
EMP—48. 86 Bee Hive coke ovens.

MAHONING COAL & COKE CO.
Connellsville, Pa. No report.

MANOR GAS COAL CO.
General Office, Philadelphia, Pa.
Denmark Mine, Drift and Slope, Pgh. Seam, 66 to 76 in. thick.
PO—Claridge, Pa. SP—Same. CTY—Westmoreland; RR—P.R.R., Manor, Br.
PR—S. Pemberton Hutchison, Philadelphia, Pa.
TR—George McCall....Philadelphia, Pa.
GS—H. L. Good, ... Claridge, Pa.
PA—W. F. Gallagher, " "
EM—Mr. Evans, " "
MM—Bert Kipple, " "
EE—T. D. Parfitt, " "
S of H—Mules, rope, steam and 6 elec. loco. Track gauge 40 in.
S of M—Hand and 13 elec. mach.
PP—10 return tubular boilers, (Erie and Phoenix), total 1,400 H. P., 4 gen. units, A. C., 3 phase, 60 cycles, 550 volts D. C., 9 pumps.
EMP—400. Last fiscal year output 400,000 tons.

MANS WILLIAMS COAL CO.
See R. H. Heath & Co.

MAPLE FURNACE COAL CO.
Windber, Pa. No report.

MAPLE GLEN COAL WORKS.
General Office, 616 Oliver Bldg., Pgh., Pa.
Maple Glen Mine, Drift, Pgh. Seam 4 to 7½ ft. thick.
PO—Shoring, Pa.; SP—Maple Glen; CTY—Washington, Pa.; RR—P. V. & C.
GM—Chas. W. Braznell..Pittsburgh, Pa.
GS—Chas. W. Braznell, " "
PA—Chas. W. Braznell, " "
MS—Carl W. Braznell....Shoring, Pa.
EE—James Crouch, " "
EM—Frank Boyd,.....Uniontown, Pa.
SCO—Maple Glen Supply Co., Shoring, Pa. Buyer, C. F. Stockdale.
S of H—1 Elec. loco., track gauge 42 in.
S of M—4 Elec. machines.
PP—1 Return tubular boiler, 100 H. P., 1 gen. unit, 250 volts, D. C., 2 pumps.
EMP—100. Last fiscal year output, 70,083 tons.

MAPLE RIDGE COAL CO.
General Office No. 1 Broadway, New York, N. Y.
PR—D. L. Morrison, New York, N.Y.
TR—W. F. Ainsworth, " "
GM—W.A. Marshall, " "
GS—F. A. Shultz......Hollsopple, Pa.
PA—W. E. Wilson, " "
EM—Fetterman Eng. Co., Johnstown, Pa.
SCO—Maple Ridge Supply Co., Buyer, Frank Stuart, Holsopple, Pa.
Sales Agency, W. A. Marshall & Co., New York, N. Y.

Maple Ridge Mine; Drift C Prime Seam; 48 in. thick.
PO—Hollsopple, Pa.; SP—Same; CTY—Somerset.
RR—B.& O., S. & C. Branch.
S of H—Mules and rope; track gauge 36 in.
S of M—1 Elec. mach. and hand.
PP—2 Return tubular boilers, total 275 H. P., 2 pumps.
EMP—75. Last fiscal year output 69,932 tons.

Bethel Mine; Slope; Miller Seam; 36 to 54 in. thick.
PO—Hollsopple, Pa.; SP— Same; CTY Somerset.
RR—B. & O., S. & C. Branch.
S of H—Rope and mules, track gauge 42 in.
S of M—3 Elec. mach.
PP—2 Return tubular boilers, total 250 H. P., 1 pump.
EMP—50. Last fiscal year output 67,174 tons.

MAPLE RUN COAL CO.
Clearfield, Pa. No report.

MARIETTA-CONNELLSVILLE COKE CO.
General Office, Connellsville, Pa.
Marietta Mine; Drift; Pgh. Seam; 90 in. thick.
PO—Ligonier, Pa.; SP—Same; CTY—Westmoreland; RR—Ligonier Valley.
PR—R. Marietta.........Ligonier, Pa.
TR—R. Marietta, " "
GS—S. R. Kelly, ... Ligonier, Pa.
S of H—Mules.
S of M—Hand.
PP—1 boiler, 15 H. P.
EMP—45. Coke ovens 40.

MARTIN'S BRANCH COAL MINING CO.
General Office, Portage, Pa.
Branch Nos. 1 and 2; Slope; "C" Seam; 42 in. thick.
PO—Portage, Pa.; SP—Same; CTY—Cambria; RR—P. R. R.; Martin's Branch.
PR—W. P. Maguire....Harrisburg, Pa.
TR—F. M. Tompkins.....Portage, Pa.
GM—F. M. Tompkins " "
GS—F. M. Tompkins " "
PA—F. M. Tompkins " "
S of H—Mules and rope.
S of M—Hand.
EMP—45. Last fiscal year output 32,334 tons.
Sales Agent, Martin's B. C. M. Co., Harrisburg, Pa.

MARYLAND COAL CO. OF PENNA
General Office, Commercial Trust Bldg., Philadelphia, Pa.
Maryland Mine, Shaft, Miller Seam.
PO—St. Michael, Pa. SP—Same. CTY—Cambria; RR—P. R. R.
PA—W. W. Whitney, Philadelphia, Pa.
TR—B. L. Simpson, " "
MS—Jas. Keenan, St. Michael, "
S of H—Elec. loco.
S of M—Elec. mach.
PP—4 water tube boilers, total 1,600 H. P., gen. units, 2,300 volts A. C., 550 volts D. C.
Output 1700 tons daily.

MARYLAND COAL & COKE CO.
General Office, Philadelphia, Pa.
Imperial No. 2 Mine; Drift; "B" seam, 48 in. thick.
PO—Osceola Mills, Pa.; SP—Houtzdale, Pa.; CTY—Clearfield; RR—P. R. R., Amesville Branch.
PR—George P.Spates, Philadelphia, Pa.
TR—Frank A. Taylor, " "
GM—Medford J. Brown, " "
PA—J.Frank Brown, Osceola Mills, Pa.
MS—J.Frank Brown, " " "
S of H—2 elec. loco. Track gauge 36 in.
S of M—Hand.
PP—Power purchased.
Output 450 tons daily.

MEADOW LANDS COAL CO.
General Office, National Bank Bldg., Pittsburg, Pa.
Receivers, J. S. Boggs and Geo. W. Tice.

No. 2 Mine; Shaft; Pgh. Seam, 66 in. thick.
PO—Arden, Pa.; SP—Same; CTY—Washington; RR—P. C. C. & St. L.
MS-Wm. Lawler..........Arden, Pa.
S of H—8 Elec. loco. and mules.
S of M—11 Elec. mach.
PP—6 Boilers, 900 H. P., gen. units, 500 volts D. C., 3 pumps, also purchase power.

No. 3 Mine; Slope; Pgh., Seam, 66in thick.
PO—Avella, Pa.; SP—Same; CTY—Washington; RR—W. T.
MS-James Collins........Avella, Pa.
S of H—3 Elec. loco. and mules.
S of M—8 Elec. Mach.
PP—1 Boiler, 150 H. P., gen units, 500 volts D. C., 3 pumps; also, purchase power.
EMP—Total, 1,000.

MECO COAL COMPANY
General Office, Trust Bldg., Johnstown, Pa.
Meco No. 1 Mine; Drift; "B" or Miller Lower Freeport Seam; 48 to 54 in. thick.
PO—Indiana, Pa.; SP—Homer City, Pa.; CTY—Indiana; RR—Penna., Yellow Creek branch.
PR—John C. Cosgrove...Johnstown, Pa.
GM—John C. Cosgrove, " "
TR—Paul B. Cosgrove, " "
EM—A. B. Crichton, " "
MM—L. O. Gregg, " "
GS—Bert Sprague...R. D., Indiana, Pa.
PA—Lafayette Tuck....Homer City, Pa.
S of H—2 elec. loco.
S of M—3 elec. mach.
PP—Purchase power.
EMP—50.
Note—Successors to Crown Hill Coal Mining Co.

MERCER IRON & COAL CO.
General Office, Stoneboro, Pa.
PR—E. P. Watson......Silverton, Colo.
TR—John G. Cann.......Stoneboro, Pa.
GM—Robert P. Cann, " "
PA—Robert P. Cann, " "
GS—L. J. Cann, " "
EM—L. J. Cann, " "
CE—Cleveland Const. Co., Cleveland, O.
Stoneboro No. 7 Mine; Shaft; Brookville Seam; 48 to 72 in. thick.
PO—Stoneboro, Pa.; SP—Same; CTY—Mercer; RR—N. Y. C., Franklin Br.
S of H—7 Elec. loco.; track guage 36 in.
S of M—8 Elec., 15 Comp. Air mach., and hand.
PP—2 Water tube, 5 return tubular boilers, total 1000 H. P., 8 gen. units, 2200 A. C., 500 volts D. C., 1 compressor, 4 pumps.
EMP—400. Last fiscal year output 230,000 tons.

Sutton No. 10 Mine; Drift; L. Kittanning Seam, 36 to 72 in. thick.
PO—Kingsville, Pa.; SP—Sutton, Pa.; CTY—Clarion; RR—N. Y. C., J. F. & C. Br.
MS—George Young.......Kingsville, Pa.
S of H—Mules; track gauge 36 in.
S of M—Hand.
EMP—40. Last fiscal year output 23,200 tons.

No. 9 Sutton Mine; Shaft; Brookville Seam, 48 to 72 in. thick.
PO—Kingsville; SP—Sutton; CTY—Clarion; RR—N. Y. C.
MS—Geo. Young.......Kingsville, Pa.
S of H—Mules.
S of M—6 comp. air mach.
PP—3 return tubular boilers, total 140 H. P., 1 air comp., 1 pump.
EMP—20. Last fiscal year output 6,000 tons.

MERCHANTS COAL CO.
General Office, Union Bank Bldg., Pittsburgh, Pa.
Mines in Pa. and in W. Va.
Thurston Wright, A. M. Bell, Receivers, Pittsburgh, Pa.
GS—John Gibson, Jr.......Boswell, Pa.
PA—E. P. Payne......Pittsburgh, Pa.
CE—John M. Rayburn, " "
EM—C. E. Hurd..........Boswell, Pa.
EE—Thos. Houlton, " "
SCO—Penn Mercantile Co., Boswell, Pa.

Orenda Mine No. 2; slope, "C" Prime Seam, 6 ft. thick.
PO—Boswell, Pa. SP—Same. CTY—Somerset; RR—B. & O., Boswell Br.
MS-Jno. Gibson, Jr.......Boswell. Pa.
SM—E. C. Hazlett.
S of H—18 elec. loco., mules and rope; track gauge 42 in.
S of M—2 elec. mach. and hand.
PP—8 Water tube boilers, total 2400 H. P., 3 gen. units 250 volts D. C., 3 pumps.
EMP—550. Last fiscal year output 425,247 tons.

Elk Lick Mine, drift, Pgh. Seam, 6 ft. thick.
PO—Elk Lick, Pa. SP—Salisbury, Pa CTY—Somerset. RR—B. & O.
MS—J. C. Trevorrow, R. D. No. 1 Meyersdale, Pa.
S of H—2 Elec. loco; track gauge, 42 in.
S of M—Elec.
PP—2 Return tubular boilers, 1 gen. unit 250 volts D. C.
EMP—60. Last fiscal year output 34,144 tons.

MERRILL, W. A. & SON.
Quality Mine; Drift; Big Pittsburgh Seam; 44 to 54 in. thick.
PO—Garrett, Pa.; SP—Pine Hill, Pa.; CTY—Somerset; RR—B. & O., Berlin Branch.
PR—W. A. Merrill, Garrett, Pa.
GM—C. A. Merrill, " "
MS—C. A. Merrill, " "
EM-S. W. Pritts,.........Berlin, Pa.
SCO—Enterprise Supply Co. Buyer, S. P. Lease, Garrett, Pa.
S of H—1 gasoline motor and mules. Track gauge 42 in.
S of M—1 Comp. air mach. and hand.
EMP—28. Last fiscal year output 30,985 tons.

MEYERSDALE FUEL CO.
Fuel Nos. 1, 2 and 3 Mines; Drifts, Pgh. Seam; 60 to 84 in. thick.
PO—Meyersdale, Pa.; SP—West Salisburg, Pa.; CTY—Somerset; RR—B. & O., Salisbury Br.
PR—R. E. Beerits........Somerset, Pa.
TR—A. G. Smith......Meyersdale, Pa.
GM—A. G. Smith, " "
PA—A. G. Smith, " "
MS-H. C. Siehl, " "
CE—J. J. Hoblitzell, Jr. " "
S of H—Mules and 1 steam loco. Track gauge 36 in.
S of M—Hand.
PP—None.
EMP—145. Last fiscal year output 90,560 tons.

MIDLOTHIAN COAL CO.
General Office, Land Title Bldg., Philadelphia, Pa.
Midlothian Mine; Slope; Fulton Seam, 42 to 66 in. thick.
PO—Dudley, Pa.; SP—Same; CTY—Huntingdon; RR—H. & B. T.
PR—W. H. Bradford..Philadelphia, Pa.
TR—R. R. Rutlinger, " "
GM—W. H. Reed, ...Dudley, Pa.
PA—W. H. Reed, " "
MS—W. H. Reed, " "
S of H—Rope.
S of M—Hand.
PP—1 Erie boiler, 1 pump.
Sales Agency, W. H. Bradford Co., Inc. Philadelphia, Pa.

MILFORD COAL CO.
General Office, Johnstown, Pa.
Murdock Mines; Shaft and Drift; A and B Seams; 3 to 6 ft. thick.
PO—R. F. D. No. 1, Somerset, Pa.; SP—Murdock, Pa.; CTY—Somerset; RR—B. & O.
PR—J. M. Murdock, .. Johnstown, Pa.
TR—W. F. Murdock, " "
GM—H. B. Murdock, " "
PA—H. B. Murdock, " "
MS—I. W. Walter........Somerset, Pa.
S of H—Mules. Track gauge 36 in.
S of M—Hand.

MILLER, CLARK S.
Miller Mine; Seam, 48 in. thick.
PO—Indian Head, Pa.; SP—Miller's Crossing, Pa.; CTY—Fayette; RR B. & O.
GM—Clark S. Miller, Indian Head, Pa.
S of H—Mules.

MILLER COAL CO.
General Office, Philadelphia, Pa.
Miller No. 1 Mine, Shaft.
PO—Portage, Pa. SP—Same. CTY—Cambria. RR—P. R. R.
PR—C. H. Brown....Philadelphia, Pa.
TR—H. R. Burt, " "
GM—H. R. Burt, " "
GS—C. B. Maxwell " "
PA—C. B. Maxwell, " "
MS—J. W. Buckwalter, Portage, "
S of H—Rope.
S of M—Hand.
PP—4 boilers, total H. P. 800.
EMP—450.

MILLER RUN COAL CO.
Miller Run No. 1 Mine.
PO—Hastings, Pa. CTY—Cambria.
EMP—36. Last fiscal year output 27,029 tons. State report.

MILSOM COAL COMPANY.
Now part of Sugar Run Coal Mining Co.

MINNS, GEO. JR.,
Clear Run Mine, Drift; "Upper Freeport" Seam, 36 to 78 in. thick.
PO—Du Bois, Pa.; SP—Same; CTY—Clearfield.
GM—George Minns, Jr. Du Bois, Pa.
MS—George Minns, Jr. " " "
S of H—Mules; track gauge 36 in.
S of M—1 Electric machine.
PP—Purchase power.
EMP—11. Last fiscal year output, 14,000 tons.

MITCHELL-WATSON COAL & COKE CO.
General Office, Saltsburg, Pa.
Mitchell Watson Nos. 1 and 2, Drifts, Upper Freeport or Bed "E" Seam, 48 to 36 in. thick .
PO—Mooween, Pa.; SP—White, Pa.; CTY—Indiana; RR—Penna. R. R.;—Conemaugh Div.
PR—G. P. McCartney, Saltsburg, Pa.
TR—James P. Watson, " "
GM—James P. Watson, " "
PA—James P. Watson, " "
GS—Charles S. Ray, " "
CE—Albert Smith, " "
MM—Jacob Emanuel......Mooween, Pa
MS—A. T. Kime, " "
SCO—Watson Supply Co., Buyer, James P. Watson.
SM—T. P. Brickel........Moween, Pa.
S of H—3 Elec. loco., track gauge 39 in.
S of M—9 elec. mach., 6 comp. air machines.
PP—3 Erie City Water tube boilers, total 450 H. P., 2 Gen. units 250 volts; 1 air compressor, 2 pumps.
EMP—125. Last fiscal year output 109.174.92 tons.

MIZENER, F. A., ESTATE OF
Grant Mine, Drift, Kittanning Seam.
PO—Claytonia, Pa. SP—Same. CTY—Butler. RR—B. & A. V.
GM—M. P. Mizener.........Erie, Pa.
PA—M. P. Mizener, " "
MS—Wm. Skinner.......Claytonia, Pa.
S of M—Comp. air.
PP—1 return tubular boiler, total 150 H. P., 1 air compressor.
EMP—97. State report.

MOHAWK MINING CO.
Mohawk Mine; Drift; L. Freeport Seam, 36 to 76 in. thick.
PO—Kittanning, Pa.; SP—Same; CTY—Armstrong; RR—P. S. & N.
PR—N. L. Strong, ...Kittanning, Pa.
TR—C. H. Ferne, " "
EM—Fred Norman, " "
S of H—3 Elec. loco.; track gauge 42 in.
S of M—4 Elec. mach.
PP—Power purchased; 1 motor generator set, 250 volts D. C., 3 phase, 60 cycle, 4 elec. pumps.
EMP—125. Output 700 tons daily.
Sales Agency, Shawmut Coal & Coke Co., Buffalo, N. Y.

MONARCH COAL CO
Monarch Mine; Drift; L. Kittanning Seam, 42 to 48 in. thick.
PO—East Brady, Pa.; SP—Red Bank, Pa.; CTY—Clarion; RR—P. R. R., Allegheny Valley Branch.
TR—Dr. G. D. Morgan..East Brady, Pa.
GM—Dr. G. D. Morgan " " "
GS—Dr. G. D. Morgan " " "
PA—Dr. G. D. Morgan " " "
MS—John Rider, " " "
EM—S.T. Mortimer, " " "
MM—Roy Fennell, " " "
EE—Joseph Painter, " " "

S of H—1 Elec. loco.; track gauge 31 in.
S of M—3 Elec. mach.
PP—1 gas engine, 190 H. P., 250 volts D. C., 3 pumps.
EMP—125.

MONONGAHELA RIVER CON. COAL & COKE CO.
See Pittsburgh Coal Co.

MONTEREY COAL CO.
General Office, Leechburg, Pa.
Monterey Mine, Drift.
PO—W. Monterey, Pa. SP—Same. CTY—Clarion. RR—A. V.
GM—L. W. Hicks......Leechburg, Pa.
PA—L. W. Hicks, " "
MS—A. J. Watson..West Monterey, Pa.
EM—E. A. Watters,.....Leechburg, Pa.
S of H—Mules.
S of M—11 comp. air mach.
PP—3 boilers, total 300 H. P., 2 air comp., 2 pumps.
EMP—122. Last fiscal year output 102,044 tons.

MONTOUR & LAKE ERIE COAL CO.
General Office, First National Bank Bldg., Pittsburgh, Pa.
PO—Imperial, Pa. R. F. D.; SP—Boggs Station, Pa.; CTY—Allegheny; RR—Montour.
GM—J. S. Boggs......Pittsburgh, Pa.
PA—J. S. Boggs, " "
MS—Richard Wilson,
R. D. No. 1, Imperial, Pa.
EMP—30 to 40.
New operation.

MORAVIAN COAL MINING CO.
General Office, Snow Shoe, Pa.
Moravian Nos. 1 and 2 Mines; Drifts; "B" Seam, 36 in. thick.
PO—Grassflat, Pa.; SP—Peale, Pa.; CTY—Clearfield; RR—N. Y. C.
TR—W. D. O'Brien, Snow Shoe, Pa.
PR—O. J. Harm, " " "
GM—O. J. Harm, " " "
PA—O. J. Harm, " " "
MS—Frank Greaves, ...Grassflat, Pa.
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—2 Pumps.
EMP—80.
Output for one year 75,000 tons.

MORRELLVILLE COAL MINING CO.
General Office, Johnstown, Pa.
Morrellville No. 1, 2, 3, and 4 Mines; 4 drifts; "B" or Miller Seam; 42 to 48 in. thick.
PO—Johnstown, Pa.; SP—Same; CTY—Cambria; RR—Main line P. R. R.
PR—George E. Warren,..Boston, Mass.
TR—G. Walter Anderson " "
GM—Robert Y. Brown....Johnstown, Pa.
PA—Robert Y. Brown, " "
EM—Fetterman Engineering Co.
EE—Charles Whorly.....Johnstown, Pa.
MS—J. Arthur Price, ..Johnstown, Pa.
S of H—Mules, rope, 3 elec. locos., track gauge 42 in.
S of M—3 elec. mach.
PP—Power purchased. 1 pump.
EMP—150. Last fiscal year output, 148,288 tons.
Sales Agency, Morrellville Coal Mng. Co.

MORRIS, J. V.
Claytonia Mine. CTY—Butler.
GS—J. V. Morris.........Cleveland, O.
MS—Phil E. Morris.....Grove City, Pa.
State report.

MORRISDALE COAL COMPANY.
General Office, Philadelphia, Pa.
Morrisdale Shafts Nos. 1, 2 and 3, Shaft; C. and B. Seam; 3 ft. 8 in. to 5 ft. thick.
PO—Morrisdale, Pa. SP—Same. CTY Clearfield. RR—Shafts 1 and 3, N. Y. C. & H. R. R.; No. 2, P. R. R.
PR—F. H. Wigton, Philadelphia, Pa.
TR—R. W. Wigton, " "
GS—C. B. Maxwell....Morrisdale Pa.
PA—C. B. Maxwell, " "
MS—Royal Aldstadt, " "
EM—Le Baron Smith, " "
MM—Louis Honhke, " "
EE—Rayner Morton, " "
SCO—Morrisdale Supply Co. Buyer, C. P. Pennepacker.
S of H—12 Elec. loco.; track gauge 37 in.
S of M—11 Elec. and 50 Comp. air mach.
PP—18 Return tubular boilers, total 2,600 H.P. 220 A. C., 3 phase and 60 cycles, 250 and 500 D. C. 5 air compressors, 30 pumps. Power purchased for No. 3 shaft.
EMP—556. Coke ovens—106 Bee Hive. Last fiscal year output 440,060 tons. Sales agent—C. B. Maxwell, Morrisdale, Pa.

MORRIS RUN COAL MINING CO
Lake, Jones Mine, Slope and Drift, Bloss & Morgan Seam 2 ft. to 3 ft. thick.
PO—Morris Run, Pa.; SP—Same; CITY—Tioga; RR—N. Y. C. and Erie.
PR—John Conyngham, Wilkes-Barre, Pa.
TR—T. S. Barber, " "
GM—T. S. Barber, " "
PA—Harry Ash, " "
GS—Chas. G. Morgan, Morris Run, Pa.
EE—T. S. Sage, " " "
SCO—Ellsworth & Co.; Buyer, Mark Barkwell, Morris Run, Pa.
S of H—Mules and 9 Elec. loco. Track Gauge 2 ft. 5 in.
S of M—Hand.
PP—3 Return Tubular Boilers, total 400 H. P., 4 Gen. Units, 250 Volts D. C.
EMP—700. Last fiscal year output, 325,000 tons. Sales agent, O. M. Rothfus, Corning, N. Y.

MOSHANNON COAL MINING CO

PR—C. H. Rowland, Philipsburg, Pa.
TR—C.A.Rickenbaugh, Osceola Mills, Pa.
GS—C. A. Rickenbaugh, " "
GM—C. H. Rowland, " " "
PA—C. A. Rickenbough, " " "
EM—S. H. Eastment, " " "
EE—G. W. Minns, Sam'l Swires. Sales Agent, C. W. Leslie.

Moshannon, No. 1, Drift, E Seam, 3 to 3½ ft. thick.
PO—Osceola Mills, Pa.; SP—Same. CTY—Clearfield. RR—P. R. R.
MS—Sam'l. Cartwright, Osceola Mills, Pa.
S of H—Mules, track gauge 3 ft.
S of M—Hand.
EMP—9. Last fiscal year output, 4605 tons.

Moshanon No. 8, Drift, "D" Seam 3 to 4 ft. thick.
PO—Osceola Mills, Pa. SP—Moshannon. CITY—Clearfield. RR—P. R. R.
MS—Henry Crain, Osceola Mills, Pa.
S of H—Mules. Track gauge 3 ft.
S of M—Hand.
EMP—8. Last fiscal year output 4,915 tons.

Moshannon No. 10, Drift, B seam, 5 to 3 1-3 ft. thick.
PO—Osceola Mills, Pa.; SP—Same. CTY—Clearfield. RR—P. R. R.
MS—Sam'l. Denshaw, Osceola Mills, Pa.
S of H—3 Elec. loco. Track gauge 3 ft.
S of M—4 Elec. machines.
PP—3 Water tube boilers, total 450 H. P., 2 Gen. units, 500 volts, D. C., 1 pump.
EMP—167. Last fiscal year output, 123,527 tons.

Moshannon No 11, drift, B seam, 5 to 3½ ft. thick.
PO—Osceola Mills, Pa.; SP—Same, and Phillipsburg. CTY—Center Co. Pa. RR—P.R.R.
MS—Robt. Reichard, Philipsburg, Pa.
S of H—3 Elec. loco., track gauge 3 ft.
S of M—4 Elec. machines.
PP—1 Pump. Buy power.
EMP—131. Last fiscal year output. 71,062 tons.

Electric Mine, Drift, B Seam, 5 to 4 ft. thick.
PO—Osceola Mills, Pa., SP—Same, CTY—Clearfield; RR—P. R. R.
MS—Irvin Cowher, Osceola Mills, Pa.
S of H—Mules; track gauge 3 ft.
S of M—Hand
PP—500 volts D. C., 3 boilers, each 150 H. P.
EMP—18. Last fiscal year output, 24,660 tons.

Pauline Mine not operated.

MOSHANNON COLLIERIES CO.
Drift Mine; "D" Moshannon and "E" Seam, 26 to 36 in. thick.
PO—Olanta, Pa.; SP—Mitchell. Pa.; CTY—Clearfield; RR—N. Y. C., Beech Creek Div.
GM—L. H. Hood, Seneca Falls, N.Y.
GS—L. H. Hood, " " "
PA—L. H. Hood, " " "
MS—H. B. Gensler......O'Shanter, Pa.
EM—E. W. Hess........Clearfield, Pa.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
EMP—30. Last fiscal year output 15,000 tons.
Sales Agency, Hood Coal Co., Seneca Falls, N.Y.

MOUNT HOPE COAL & COKE CO.
Mount Hope Mine, Drift, Freeport Seam, 42 in. thick.
PO—Sterling Run, Pa.; SP—Same; CTY—Cameron; RR—P. R. R.
PR—A. Brady..........Emporium, Pa.
TR—George A. Walker, Sterling Run, Pa.
GM—George A. Walker " " "
SCO—Sterling Run Store Co.,
Sterling Run, Pa.
CE—J. E. Fry..........Du Bois, Pa.
S of H—1 steam loco.; track gauge 36 in.
S of M—Hand.
PP—1 water tube boiler; total 50 H. P.
EMP—55. Last fiscal year output 38,510 tons.

MT. PLEASANT COKE CO.
PR—J. W. Kuhns, Greensburg, Pa.
TR—C. J. Kline, " "
GM—C. J. Kline, " "
GS—C. J. Kline, " "
SCO—Mt. Pleasant Supply Co., Buyer, George E. Nicely, Greensburg, Pa.

Boyer Mine, Slope; Connellsville Seam, 9 ft. thick.
PO—Mt. Pleasant, Pa. SP—Udell, Pa. CTY—Westmoreland. RR—P. R. R.—S. W. P. Branch.
MS—Henry Ahlbouree, Mt. Pleasant, Pa.
SM—S. L. Walker, " "
S of H—Mules and rope; trackage 44 in.
S of M—Hand.
PP—1 Water tube boiler, 150 H. P., 1 pump.
EMP—86. Coke ovens, 120 Bee Hive.

Beatty Mine, Drift and slope; Connellsville Seam, 9 ft. thick.
PO—Greensburg, Pa. SP—Beatty Pa. CTY—Westmoreland. RR—P. R. R.
MS—James Murtha......Greensburg, Pa.
SM—T. M. Daniels, R. F. D. No. 5, Greensburg, Pa.
S of H—Mules and rope. 1 Steam Loco Track gauge 44 in.
S of M—Hand.
PP—4 Water tube boilers, total 375 H. P.; 3 Pumps.
EMP—182; Coke Ovens, 182 Bee Hive.
Last fiscal year output, 88,838 tons. tons

MT. PLEASANT-CONNELLSVILLE COKE CO.
General Office, Greensburg, Pa.
Mt. Pleasant Mine; Shaft; Connellsville Seam, 108 in. thick.
PO—Mt. Pleasant, Pa. SP—Hecla, Pa. CTY—Westmoreland. RR—P. R. R., S. W. P. Div.
PR—J. W. Kuhns......Greensburg, Pa.
TR—C. J. Kline, " "
GM—C. J. Kline, " "
GS—C. J. Kline, " "
PA—C. J. Kline, " "
MS—Jas. Murtha.....Mt. Pleasant, Pa.
EM—P. B. Rule.......Greensburg, Pa.
SCO—Mt. Pleasant Supply Co., Buyer. Geo E. Nicely, Greensburg, Pa.
SM—T. O. Anderson, Mt. Pleasant, Pa.
S of H—Mules, rope and steam loco.; track gauge, 44 in.
S of M—Hand.
PP—3 water tube boilers, total 1000 H. P.; 2 Compressors and 3 pumps.
EMP—300. Coke ovens, 100 Bee Hive 210 Rectangular. Last fiscal year output 432,000 tons.

MOUNTAIN COAL CO.
General Office, Greensburg, Pa.
Yellow Run Mine; Shaft; Miller or "B" Seam; 45 in. thick.
PO—Dunlo, Pa.; SP—Same; CTY—Cambria; RR—Penna., South Fork Br.
PR—Julian B. Huff.....Greensburg, Pa.
TR—H. W. Coulter, " "
GM—A. N. Pershing, " "
PA—A. N. Pershing, " "
EM—Robert Morris, " "
GS—M. J. Bracken......Gallitzin, Pa.
MS—J. G. Dunsmore........Dunlo, Pa.
SCO—Yellow Run Supply Co., Buyer, M. A. Luse, Dunlo, Pa.
S of H—Mules, rope and 1 Elec. loco.
S of M—Hand.
PP—3 Water tube boilers, total 750 H. P., 1 air comp. and 2 pumps.
EMP—228. Last fiscal year output 178,446.77 net tons.
Sales Agency, Keystone Coal & Coke Co., Greensburg, Pa.

MOUNTAIN SMOKELESS COAL CO.
General Office, Beaver, Pa.
Mountain Smokeless Mine; Drift; Twin Vein; 48 in. thick.
PO—Casselman, Pa.; SP—Same; CTY—Somerset; RR—B. & O.
PR—H. W. Reeves....Beaver Falls, Pa.
TR—David A. Nelson......Beaver, Pa.
GM—I. W. Logan......Rochester, Pa.
PA—I. W. Logan, " "
MM—W. T. Wiltrout...Casselman, Pa.
MS—W. T. Wiltrout, " "
S of H—Rope and 1 steam loco. Track gauge 42 in.
S of M—10 Compressed air mach.
PP—2 Erie water tube boilers, total 200 H. P., 1 compressor, and 4 pumps.
Note—Not operating at present.
Sales Agent, F. O. Brandt, Pittsburgh, Pa.

MOUNTZ, S. J. & CO.
PR—S. J. Mountz....Smith Mills, Pa.
GS—S. J. Mountz, " "
TR—E. J. Mountz, " "
GM—E. J. Mountz, " "
PA—E. J. Mountz, " "
EM—Wm. Close, " "
EE—James McHugh, " "
SCO—S. J. Mountz & Co., Buyer E. J. Mountz.

(Continued on Next Page.)

Viola No. 1 Mine; Slope; Miller Seam; 54 to 72 in. thick.
PO—Smith Mills, Pa.; SP—Smoke Run, Pa.; CTY—Clearfield; RR—P. R. R.
MS—Thos. Gunnel....Smith Mills, Pa.
S of H—Mules, rope, 1 gasoline and 2 elec. loco. Track gauge 36 in.
S of M—Hand and 1 elec. mach.
PP—1 return tubular boiler, 120 H. P., 1 pump. Purchase power.
EMP—150. Last fiscal year output 116,000 tons.

Mine S—106, Drift, Freeport seam, 5 to 5½ ft. thick.
PO—Smith Mills, Pa SP—Annandale, Butler Co., Pa. RR—Bessemer & L. E.
MS—Fred Jeffries, .. Smith Mills, Pa.
S of H—Mules; track gauge 3 ft.
S of M—Hand.
EMP—50. Last fiscal year output 8,000 tons.

MUNSTER COAL CO.

Drift Mine, Miller Seam, 42 in. thick.
PO—Altoona, Pa.; SP—Portage, Pa.; CTY—Cambria; RR—P. R. R.
TR—H. Hahman..........Altoona, Pa.
PA—H. Hahman, " "

MUTUAL COAL MINING CO

General Office, Grove City, Pa.
Royal Mine, Drift Mine, Brookville Seam 48 to 52 in. thick.
PO—Argentine, Pa. SP—Same. CTY—Butler RR—B. & L. E. Hilliard Br.
PR—Harry Hamilton, ..Grove City, Pa.
TR—Harry Hamilon, " " "
GM—Harry Hamilton, " " "
GS—John C. Hamilton, Argentine, Pa.
PA—Harry Hamilton, Grove City, Pa.
S of H—Mules, Track gauge 3 ft. 1 in.
S of M—10 comp. air mining machines,
PP—Boiler, total 300 H. P. Erie; 1 compressor; 4 pumps. Last fiscal year output 40,000 tons.

MYERS, HENRY.

Monroe Mine; Drift; "C" Seam, 31 to 32 in thick.
PO—Osceola Mills, Pa. SP—Same. CTY—Clearfield. RR—P & S.
PR—Henry Myers....Osceola Mills, Pa
GM—Henry Myers. " " "
MS—Henry Myers " " "
EM—H. S. Shillingford, Osceola Mills, Pa.
S of H—Mules; track gauge 30 in.
S of M—Hand.
EMP—5. Last fiscal year output 2,675 tons.

NANT-Y-GLO COAL MINING CO.

General Office, 727 Land Title Bldg., Philadelphia, Pa.
PR—B. Dawson Coleman, Philadelphia, Pa.
TR—J. E. Wilkinson, " "
PA—J. E. Wilkinson, " "
GS—C. E. Sharples.....Ebensburg, Pa.
MS—C. E. Sharples, " "
CE—C. E. Sharples, " "
MF—Thos. Moody,.....Nant-Y-Glo, Pa.
EM—H. F. Dorr, " "
MM—David Davis, " "
EE—Geo. McTigue, " "
SCO—Nant-Y-Glo Trading Co. Buyer, A. J. Connely, Nant-Y-Glo, Pa.

Nant-Y-Glo No. 1 Mine; Drift; Lower Kittanning, Miller or B Seam; 42 to 53 in. thick.
PO—Nant-Y-Glo, Pa.; SP Same; CTY—Cambria; RR—Penna., Black Lick branch.
S of H—Rope and 4 elec locos. Track gauge 36 in.
S of M—1 shortwall elec. mach., 30 punchers.
PP—4 Phoenix return tublar boilers, total 1000 H. P., 2 gen. units, 2300 volts A. C., 3 phase, 60 cycles, 2 air comp.
EMP—125. Last fiscal year output 79,264 tons.

Nant-Y-Glo No. 2 Mine; Drift; Lower Kittanning, B, or Miller Seam; 34 to 38 in. thick.
PO—Elmora, Pa; SP—Bakerton; CTY—Cambria; RR—Penna., Cresson to Cherry Tree branch.
S of H—Mules. Track gauge 36 in.

Nant-Y-Glo No. 3 Mine; Slope; Lower Kittanning, B, or Miller Seam; 44 to 52 in. thick.
PO—Nant-Y-Glo, Pa.; SP—Same; CTY—Cambria; RR—Cambria & Indiana. Nant-Y-Glo branch.
S of H—Rope and 1 elec. loco. Track gauge 36 in.
S of M—3 elec. mach.
PP—3 pumps and 1 air compressor.
EMP—40.
Note—Just commenced development.

NAOMI COAL CO.

General Office, Pittsburgh, Pa.
Naomi Mine, Slope, Pgh. Seam; 7 ft. thick.
PO—Belle Vernon, Pa.; SP—Same; CTY—Fayette; RR—P. & L. E.
Samuel A. Gilmore. and Wm. K. Johnson, Receivers.
PA—J. I. Boyd......Pittsburgh, Pa.
GS—E. L. Morris, " "
MS—Geo. Crossland, Belle Vernon, Pa.
SM—W. D. Thompson, " "
EM—H. M. Schmidt....Pittsburgh, Pa.
MM—Thos. Halton, "
EE—Thos. Halton, " "
SCO—Penn Mercantile Co., buyer, H. D. Bittner, Pittsburgh, Pa.
SM—W. D. Thompson, Bellevernon, Pa.
S of H—9 elec. loco.; track gauge 44 in.
S of M—12 Elec. mach.
PP—Power purchased. 550 volts D. C.
EMP—294. Last fiscal year output 273,161 tons.

NATIONAL MINING CO.

General Office, 410 Frick Bldg., Pittsburgh, Pa.
PR—W. H. Clingerman..Pittsburgh, Pa.
TR—J. L. Lowther, " "
GS—F. A. McDonald......Morgan, Pa.
PA—T. S. Duncan, Pittsburgh, Pa.
PP—4 Sterling water tube boilers, total 1200 H. P., 2 gen. units.
SCO—Union Supply Co., Frick Bld'g., Pittsburgh, Pa.

National No. 1 Mine Slope, Pgh. Seam 62 in. thick.
PO—Morgan, Pa. SP—Sygan, Pa. CTY—Allegheny. RR—P. C. C. & St. L., B. & M. Branch.
MS—F. A. McDonald, Morgan, Pa.
SM—C. Z. Wilson........Morgan, Pa.
S of H—Elec. track gauge 42 in.
S of M—Elec.

National No. 2 Mine, Slope, Pgh. Seam 62 in. thick.
PO—Cuddy, Pa. SP—Treveskyn, Pa; Co—Allegheny. RR—P. C. C. & St. L., B & M Branch.
MS—F. A. McDonald, Morgan, Pa.
SM—M. C. Stover, Cuddy, Pa.
S of H—Elec. track gauge 42 in.
S of M—Elec.

NELLIE COAL COMPANY.

General Office, Buffalo, N. Y.
Nellie Mine, Slope; Brookville Seam, 3½ to 3 ft. 8 in. thick.
PO—Argentine, Pa. SP—Same. CTY—Butler. RR—B. & L. E.
TR—W. D. Ward, Buffalo, N. Y.
GM—C. B. McFarlin, Argentine, Pa.
PA—C. B. McFarlin, " "
S of H—Mules.
S of M—Hand and 3 Compressed Air Machines.
PP—2 Return Tubular Boilers, total 300 H. P. 1 air compressor, 1 pump.
EMP—83.
(Old information.)

NEMACOLIN COAL COMPANY.

Nemacolin Mine; Drift; D Vein; 48 to 54 in. thick.
PO—Listonburg, Pa; SP—Same; CTY—Somerset; RR—B. & O., Whites Creek branch.
PR—R. O. Dunne, .. Pittsburgh, Pa.
TR—J. Wilfrid Ely, " "
GM—J. Wilfrid Ely, " "
PA—Moss Hawk, ...Listonburg, "
MS—Moss Hawk, " "
S of H—Rope and gravity. Track gauge 42 inches.
PP—Boiler, total 30 H. P.
EMP—42. Last fiscal year output, 7000 tons.
Note—Successors to Baker-Hawk Mining Company.

NEVLING COAL MINING CO., Inc. (The).

General Office, Clearfield, Pa.
Little Beaver No. 1 Mine; Drift B Seam 51 in. thick.
PO—Houtzdale, Pa., SP—Brisbin, Pa., CTY—Clearfield. RR—Pitts. & Susq. Connecting with New York Central.
PR—J. B. Nevling, Clearfield, Pa.
GS—R. F. Nevling, " "
TR—R. F. Nevling, " "
PA—J. B. Nevling, " "
MM—H. B. Nevling, Houtzdale, Pa.
EM—Womelsdorff & Dunkle, Philipsburg. Pa.

S of H—Mules; track gauge 36 in
S of M—Hand.
PP—1 pump. Purchase power.
EMP—33. Last fiscal year output 12,903 tons.

NEW ALEXANDRIA COKE CO.

General Office, Greenburg, Pa.
New Alexandria Mines Nos. 1, 2, 3 4 and 5, Drifts, Pittsburgh Seam, Greensburg Basin, 7 to 8½ ft. thick.
PO—New Alexandria, Pa. SP—Andrico, Pa. CTY—Westmoreland. RR—P. R. R.
PR—R. H. Jamison, Greensburg, Pa.
GM—R. H. Jamison, " "
PA—Paul Johnson, " "
EM—C. L. Clark, New Alexandria, Pa
MS—C. L. Clark, New Alexandria, Pa
..**S of H**—Mules, gravity and 3 Elec. loco. Track gauge 42 in.
S of M—Hand and 1 puncher and 1 chain mach.
PP—2 Return boilers, total 250 H.P., 2 Gen. units 250 volts D. C.
EMP—350. Last fiscal year output Nos. 1, 2, 3, 4 and5 Mines combined, 448,576 tons.
Sales Agent, Paul Johnson, Greensburg, Pa.

NEWCOMER COKE CO.

General Office, Uniontown, Po.
PR—Elias Wineland, Philadelphia, Pa.
TR—R. W. Gilmore, Uniontown, Pa.
GM—J. W. Abraham, " "
PA—J. W. Abraham, " "
GS—J. W. Abraham, " "
EM—Fayette Eng. Co. " "
CE—Fayette Eng. Co. " "
MS—F. O. Nichols, " "
Newcomer Mine, Drift, Pittsburgh Seam, 9 ft. thick.
S of H—Mules. Track gauge 42 in.
S of M—Hand.
30 Bee Hive coke ovens.

Pritts Mine, Drift, Pittsburgh Seam, 9 ft thick.
PO—Connellsville R. F. D. SP—Scottdale, Pa. CTY—Fayette. RR—B. & O.
S of H—Mules; track gauge 42 in.
S of M—Hand
EMP—45. Last fiscal year output 36,000 tons. 50 Bee Hive coke ovens.

NEW YORK AND CLEVELAND GAS COAL CO.

General Office, Oliver Bldg., Pittsburgh, Pa.
PR—W. K. Field ....Pittsburgh, Pa.
TR—Wm. Miller, " "
GM—G. W. Schluederberg, " "
PA—F. E. Now, " "
EM—E. J. Taylor, " "
EE—A. B. Kiser, " "
GS—Hugh Dunning...Turtle Creek, Pa.

Delmont Mine.
PO—Export, Pa., R. D. SP—Same. CTY—Westmoreland. RR—P.R.R.
S of H—3 elec. locos.
S of M—Hand.
PP—2 return tubular boilers, total 700 H. P., 2 pumps.
EMP—862. Last fiscal year output 804,396 tons.

Lyons Run Mine.
PO—Irwin, Pa., R. D. No. 2. SP—Saunders. Pa. CTY—Westmoreland. RR—P. R. R.
S of H—Rope.
S of M—Hand.
PP—4 boilers, total 450 H. P., 3 pumps.
EMP—173. Last fiscal year output 66,462 tons.

Plum Creek Mine, Drift, Pgh. Seam.
PO—Unity, Pa. SP—Verona, Pa. CTY—Allegheny. RR—P. R. R.
S of H—2 steam locos. and mules.
S of M—Hand.
EMP—230. Last fiscal year output 174,165 tons.

NIGHTINGALE COAL COMPANY

General Office, Garrett, Pa.
Nightingale Mine; Drift; 36 in. thick.
PO—Garrett, Pa.; SP—Same; CTY—Somerset; RR—B. & O., Berlin Br.
GM—W. J. Currie........Garrett, Pa.
S of H—Mules.
S of M—Hand.
EMP—10. Daily output, 50 tons.
Sales Agency, Nightingale Coal Co., Garrett, Pa.
Note—Successors to Lee W. Pollard & Co.

NINEVEH COAL & COKE CO.

General Office, Penn Square Bldg., Philadelphia, Pa.
Valley Smokeless No. 2 Mine; Shaft; "B" Seam, 42 to 46 in. thick.
PO—Seward, Pa.; SP—Same; RR—P. R. R., Main Line; CTY—Westmoreland.
PR—John C. Dawson, Penn Sq. Bldg., Philadelphia. Pa.
TR—T. Frank Bartholomew, Penn Square Bldg., Philadelphia, Pa.
GS—C. C. Dovey. ....Johnstown, Pa.
PA—T. Frank Bartholomew, Philadelphia, Pa.
MS—H. G. Dick..........Seward, Pa.
SCO—Nineveh Supply Co., Seward, Pa.
S of H—Mules.
S of M—Hand.
PP—2 Boilers, total 400 H.P., 3 pumps; power purchased.
EMP—118. Last fiscal year output 49,098.80 tons.
Sales Agent, Arthur Kuppinger, Philadelphia, Pa.
Formerly owned by J. Blair Kennerly.

NORTH PENN COAL CO.

General Office, Pittsburgh, Pa.
Kaylor and Pine Run Mines. Slope and drift; L. Kittanning Seam 38 to 46 in. thick.
PO—Kaylor, Pa.; SP—Same; CTY—Armstrong.
RR—Western Allegheny.
PR—A. R. Hamilton....Pittsburgh, Pa.
TR—A. R. Hamilton, " "
PA—A. R. Hamilton, " "
GM—A. R. Hamilton, " "
SCO—Allegheny Supply Co. Buyer, W. C. Shupe, Kaylor, Pa.
S of H—4 Elec. loco. and hand; track gauge 42 in.
S of M—21 Elec. mach.
PP—5 Return tubular boilers, total 900 H. P., 4 gen. units, 250 volts D. C., 5 pumps.
EMP—416. Last fiscal year output, 337,0080 tons.
Sales Agents, B. Nicholl & Co., New York, N. Y.

NORTH PITTSBURGH REALTY CO.

Harmony Junction Mine, Shaft.
PO—Eidenau, Pa. SP—Harmony Jct., Pa. CTY—Butler.
PR—R. H. Boggs.....Pittsburgh, Pa.
TR—P. E. Seddon, " "
GM—E. J. O'Brien, " "
PA—E. J. O'Brien, " "
MS—Edw. Doherty.......Eidenau, Pa.
S of H—Mules.
S of M—Hand.
PP—2 pumps, purchase power.
Last fiscal year output 22,000 tons.
Sales agent, E. J. O'Brien, Pittsburgh, Pa.

NORTHERN CONNELLSVILLE COKE CO.

Marthabel Mine, 4 openings, Drift and slopes. Pgh. Seam 7 to 10 ft. thick.
PO—Scottdale, Pa.; SP—Huff, Pa.; CTY—Westmoreland; RR—P. R. R., South West Branch.
PR—Daniel Hunt, Uniontown, Pa.
TR—James W. Buttermore, Connellsville, Pa.
GM—John R. Campbell, Scottdale, Pa.
GS—John R. Campbell, " "
PA—John R. Campbell, " "
EM—Geo. Hutchinson..Greensburg, Pa.
MM—Isaac Reager, " "
MS—Geo. H. Mills, " "
S of H—Rope, Horses and Steam Loco. Track Gauge 44 in.
S of M—Hand.
PP—1water tube boiler, 1 pump.
EMP—38. Last fiscal year output 4,052 tons. Coke ovens. 40 Bee Hive.

NORTHWESTERN MINING & EXCHANGE CO

General Office, Scranton, Pa.
PR—W. A. May, " "
TR—F. H. Wright, " "
EE—M. E. Walthall " "
GS—John H. Fulford, Dubois, Pa.
Asst GS—Wm. K. Reed, " "
EM—Alex. McDonald, " "
PA—W. R. Collins, 50 Church Sa., N.Y.
SCO—J. H. Steele & Co., Dagus Mines Pa. Buyer, R. W. Beadle.
Sales Agents, Williams & Peters, No. 1 Broadway, N. Y.

Dagus Mines, comprising Kyler, Eureka, Toby No. 2 and Toby No. 3, Drifts, "D" Seam 46 to 30 in. thick.
PO—Dagus Mines, Pa., SP—Toby Mines CTY—Elk.
RR—Erie R.R, Toby Branch.
MS—James Whamond, Dagus Mines Pa.
S of H—Mules, rope and 10 elec. loco. track gauge 30 in.
S of M—Pick, and 16 elec. machines.
PP—11 Water tube boilers, total 1700 H.P. 3 gen. units, volts, 600 D. C.
EMP—612, Last fiscal year output 430,262 tons.

Clarion No. 4, Drift, "D" Seam 60 to 28 in. thick.
PO—Crenshaw, Pa., SP—Same, CTY—Jefferson. RR—Erie RR., Toby Br.
MS—H. J. Thomas..Brockwayville, Pa.
S of H—Mules, and 1 steam loco. track gauge 30 in.
S of M—Pick.
EMP—139. Last fiscal year output 94,704 tons.

West Clarion, Drifts, "D" Seam, 18 to 50 in. thick.
PO—Brockwayville, Pa., SP—Same, CTY—Jefferson.
RR—Erie R. R., Toby Branch.
MS—H. J. Thomas, Brockwayville, Pa.
S of H—Mules and 3 elec. loco. track gauge 36 in.
S of M—Pick and 4 elec. machines.
PP—3 Water tube boilers, total 300 H.P. 1 gen. unit, 250 volts, D. C.
EMP—166. Last fiscal year output 139,700 tons.

Eriton Mine, Shaft, "D" Seam, 60 to 108 in. thick.
PO—Jefferson Line. SP—Erton, Pa., CTY—Clearfield.
RR—Erie R.R, Eriton Branch.
MS—E. W. Robertson......Eriton, Pa.

(Continued on Next Page.)

Northwestern Mng. & Exchange Co.—Cont.
S of H—13 Elec. loco., track gauge 36 in.
S of M—46 comp. air machines.
PP—10 Water tube boilers, total 2000 H. P., 2 gen. units, 500 volts, D.C., 3 air compressors, 5 pumps.
EMP—733. Last fiscal year output 520,621 tons.

NOWAK COAL CO.
Jenkins Mine, Drift; "Bloss" Seam, 3 ft. thick.
PO—Blossburg, Pa.; SP—Same; CTY—Tioga; RR—N. Y. C. & H. R.
PR—Adam Gruzlewski, .Blossburg, Pa.
TR—Chas. Nowak, " "
S of H—Mules. Track gauge 29 in.
S of M—Hand.
EMP—18. Last fiscal year output 9,580 tons.

OAKES BROS COAL CO.
Oakes Mine. Shaft. Brookville Seam, 36 to 44 in. thick.
PO—Volant, Pa.; SP—Drakes, Pa.; —CTY—Lawrence.
RR—P.R.R., Wolf Creek Branch.
PR—W. H. Oakes......Volant, Pa.
GM—W. H. Oakes, "
GS—W. H. Oakes........Volant, Pa.
TR—S. Oakes, "
MM—S. Oakes, " "
PA—Jas. Oakes...........Volant, Pa.
MS—Jas. Oakes, " "
EM—Jas. Oakes, " "
S of H—Mules; track gauge 37 in.
S of M—Hand and 3 comp. air mach.
PP—2 Return tubular boilers, total 150 H. P., 1 air compressor and 2 pumps.
EMP—47. Last fiscal year output, 28,000 tons.
Sales Agent. W. H. Oakes, Volant, Pa.

OAK RIDGE COAL & COKE CO.
Oak Ridge Nos. 1, 2 and 3 Mines; Drift; L. & Up. Freeport Seam, 36 to 60 in. thick.
PO—Hastings, Pa.; SP—Same; CTY—Cambria.
RR—P.R.R., Cambria & Clearfield Br.
PR—J. S. Moore......Houtzdale, Pa.
GM—H. J. Van Dusen..Hastings, Pa.
TR—B. R. Lloyd, " "
PA—H. J. Van Dusen, " "
MS—H. J. Huether, " "
EM—Chas. E. Schlicher, " "
SCO—Van Dusen & Co. Buyer B. J. Waltz, Hastings, Pa.
S of H—Rope and Mules; track gauge 36 in.
S of M—10 comp. air mach.
PP—3 Return Tubular Erie boilers, total 330 H. P., 2 compressors.
EMP—225. Coke ovens, 100 Bee Hive. Last fiscal year output 91,565 tons.

OCEAN COAL CO.
General Office, Commercial Trust Bldg., Philadelphia, Pa.
Ocean Nos. 1 and 2, Shafts. Pittsburgh Seam.
PO—Hermine, Pa. SP—Same. CTY—Westmoreland. RR—P. R. R.
PR—Edward J. Berwind, No. 1 Broadway, New York N. Y.
TR—E. H. Sanborn, Philadelphia, Pa.
GM—Thomas Fisher, " "
PA—W. W. Whitney, " "
S of H—Mules and 13 Elec. loco.
S of M—Elec. mach.
PP—9 boilers, total 2,000 H. P. gen. unit, 1000 K. W., 500 volts D. C.
EMP—800.

OCTORARO COAL CO.
General Office, Saxton, Pa.
Octoraro No. 1 Mine; Slope; "B" Seam; 30 to 42 in. thick.
PO—Riddlesburg, Pa.; SP—Same; CTY—Bedford; RR—H. & B. T., Six Mile Run Branch.
PR—W. W. Young, Riddlesburg, Pa.
GM—W. W. Young.....Riddlesburg, Pa.
MS—W. W. Young, " "
TR—R. H. Kay, Saxton, Pa.
PA—R. H. Kay, " "
S of H—Elec. loco. and mules.
PP—Purchase power. 1 pump.
EMP—8. Output 2,100 tons.

O'DONNELL BROS.
O'Donnell Nos. 1, 2, 3 East and 1, 2, 3, 4 West Mines; Drifts; Blossburg Seam; 30 to 60 in. thick.
PO—Morris Run, Pa.; SP—Same; CTY—Tioga.
RR—N. Y. C., Erie, R.R.
PR—J. F. O'Donnell, Morris Run, Pa.
PA—J. F. O'Donnell, " "
GM—W.F. O'Donnell, Morris Run, Pa.
MS—M. Atkinson, " "
PA—J. F. O'Donnell, " "
S of H—Mules. Track gauge 28 in.
S of M—Hand.
EMP—100. Last fiscal year output 60,000 tons.

OLIVE COAL CO.
General Office, Uniontown, Pa.
Maggie Mine, Drift, Sewickley Seam 5 to 6 ft. thick.
PO—Newcomer, Pa.; SP—Same; CTY—Fayette.
RR—P.R.R. Coal Lick Branch.
MS—H. J. Huntzinger..Uniontown, Pa.
EM—H. J. Huntzinger, " "
PA—H. J. Huntzinger, " "
S of H—Mules; track gauge 42 in.
S of M—Hand.
PP—1 Erie City return tubular boiler, 150 H. P., 1 pump.
EMP—18. Last fiscal year output 22,385 tons.
Sales Agent, H. J. Huntzinger, Uniontown, Pa.

OLIVER COAL MINING CO.
Nant-y-glo-Moshannon Mine; Slope; Lower Freeport Seam; 40 to 68 ins. thick.
PO—Nant-y-glo, Pa.; SP—Same; CTY—Cambria.
PR—B. H. Hewit......Nant-y-glo, Pa.
TR—O. H. Hewit ....Hollidaysburg, Pa.
GM—B. H. Hewit......Nant y-glo, Pa.
GS—B. H. Hewit " "
PA—B. H. Hewit " "
EM—B. H. Hewit " "
S of H—Will be storage battery. Track gauge 36 ins.

OLIVER & SNYDER STEEL CO.
General Office, Pittsburgh, Pa. Oliver Nos. 1, 2 and 3 Mines; Shaft, Connellsville Seam, 108 in. thick.
PO—Oliver, Pa. SP—Same Redstone Jct. and Oliver No. 3, Pa.; RR—P. R. R., B. & O., P. & L. E
PR—Henry Oliver.......Pittsburgh, Pa.
PA—E. A. Jenkins " "
TR—T. J. Crump " "
SECY—John Jenkins, " "
GS—J. H. Lane...........Oliver, Pa.
MS—J. H. Lane. " "
EM—Charles H. Hinsey " "
EE—C. G. Brahm, " "
MM—C. B. Patterson and L. C. Smitley, Uniontown, Pa.
S of H—2 gasoline loco., rope and horses.
S of M—Hand.
PP—31 Erie return tubular boilers; total 1940 H. P.; 2 gen. units, 220 volts DC., 2 compressors, 4 pumps.
EMP—1200; coke ovens, 1,108 Bee Hive. Last fiscal year output 750,000 tons.

OLLETT BROS. COAL CO.
Donora Mine, Drift, Youghiogheny Gas Seam, 5 ft. 10 in. to 6 1-2 ft. thick.
PO—Donora, Pa.; SP— Same; CTY—Washington.
RR—P. R. R., P. V. & C. Branch.
GM—F. B. Ollett.......Donora, Pa.
PA—F. B. Ollett, " "
GS—F. B. Ollett, " "
MS—F. B. Ollett, " "
EM—H. W. Herr, " "
EE—Greer Harvey, " "

Ollett Bros. Coal Co.—Cont.
SCO—Donora Store Co.; Buyer, R. M. Mears, Dorona, Pa.
S of H—Mules, 1 Elec. loco. and gravity; track gauge 44 in.
S of M—Hand and 3 Elec. machines.
PP—3 pumps; power purchased.
EMP—50. Last fiscal year output 32,345 tons.

Rainey Mine; Shaft and Slope; Youghiogheny Gas Seam, 72 in. thick.
PO—Finleyville, Pa; SP—Same; CTY—Washington; RR—B. & O., Wheeling Div.
S of H—Mules. Track gauge 44 in.
S of M—Elec. mach.
PP—Purchase power.
Note—New Mine. Expect to start development work about July 1st, 1916.
Sales Agent, Fort Pitt Coal & Coke Co., Pgh., Pa.

ORIENT COKE CO.
General Office, Uniontown, Pa.
Orient Mine, Shaft, Pgh. Seam 7 1-2 to 9 ft. thick.
PO—Orient, Pa.; SP—Same; CTY—Fayette.
RR—Monongahela.
PR—Julian Kennedy....Pittsburgh, Pa.
CE—Julian Kennedy, " "
TR—J. O. Miller, " "
GM—R. M. Fry......Uniontown, Pa.
PA—C. B. Garland, " "
EM—H. L. Burchinal, " "
GS—Charles Oppermann, " "
MM—S. W. Warman, " "
EE—S. W. Warman, " "
SCO—Orient Supply Co., Orient, Pa. Buyer, N. T. Fisher, Orient, Pa.
S of H—8 comp. air loco.; track gauge 44 in.
S of M—Hand and 13 comp. air mach.
PP—6 Water Tube B. & W. boilers, total 1800 H. P., 2 gen. units, 250 D.C. volts, 5 air compressors and 2 pumps.
EMP—500.
Coke ovens—480 Bee Hive.
Sales Agents, Producers Coke Co., of Orient Coke Co., Uniontown, Pa.

OSCEOLA COAL CO.
Leaders Nos. 4 and 5 Mines; Shaft and Drift; "E" and "B" Seam 48 to 60 in. thick.
PO—Osceola Mills, Pa.; SP—Same; CTY—Clearfield; RR—P. R. R.
PR—T. S. Shoemaker..Philadelphia, Pa.
TR—H. B. Swoope........Madera, Pa.
GM—H. B. Swoope, " "
PA—H. B. Swoope, " "
MS—John Stevenson, " "
EM—S. R. Moore, " "
SCO—Leader Supply Co., Buyer, H. S. Kanour, Osceola Mills, Pa.
S of H—Mules; track gauge 36 in.
S of M—6 Elec. mach.
PP—2 Erie Water tube boilers, total 300 H. P., gen. unit 250 volts A. C., 1 pump.
EMP—158. Last fiscal year output 116,327 tons.

OSTERRIED COAL COMPANY
Osterried Mine; Shaft; Upper Clarion Seam; 46 in. to 54 in. thick.
PO—Lucinda, Pa.; SP—Same; CTY—Clarion; RR—B. & O.
PR—Joseph Osterried ....Arthurs, Pa.
TR—J. A. Schill .... Lucinda, Pa.
GM—J. A. Schill " "
MS—Martin Osterried " "
S of H—Mules. Track gauge 33 in.
S of M—Hand.
PP—Gas engine.
Sales Mgr., J. A. Schill, Lucinda, Pa.

PAINT COAL COMPANY
Star Mine; Shaft; 42 in. thick.
PO—Arthurs, Pa.; SP—Same; CTY—Clarion; RR—B. & O., Kane & Foxburgh Br.
PR—S. A. Zacherl.......Arthurs, Pa.
GS—S. A. Zacherl, " "
TR—John Schwabenbaeur, Snydersburg, Pa.
GM—E. J. Carroll " "
MS—E. J. Carroll, " "
S of H—Gas engine. Track gauge 33 in.
S of M—Hand.
EMP—3.

PANTHER RUN COAL CO.
Panther Run Mine; Drift; L. Freeport Seam; 48 to 72 in. thick.
PO—Pardus, Pa.; SP—Sherwood, Pa.; CTY—Jefferson; RR—P. R. R.
PR—H. S. Thayer........gway, Pa.
TR—E. P. Newton......Pardus, Pa.
GM—E. P. Newton, "
PA—E. P. Newton, " "
MS—E. P. Newton, " "
MM—James L. Crawford, " "
EE—W. A. Stanford, " "
SCO—Pardus Supply Co., E. R. Newton, Buyer, Pardus, Pa.
S of H—5 Elec. loco., track gauge 3 ft.
S of M—4 Elec. and 22 comp. air mach.
PP—5 Return tubular boiler total 750 H. P., 1 gen. unit, 250 volts D. C., 2 compressers and 3 pumps.
EMP—158. Last fiscal year output, 180,000 tons.

PARDOE COAL CO.
General Office, Sharon, Pa.
Pardoe No. 1 and Kee Mines; Drift; Brookville Seam, 2½ to 6 ft. thick.
PO—Pardoe, Pa. SP—Same. CTY—Mercer. RR—B. & L. E.
PR—Frank P. Filer, ... Mercer, Pa.
TR—Harry J. Filer, ... Sharon, "
PA—Harry J. Filer, " "
GM—Frank P. Filer, ...Mercer, Pa.
MS Enoch W. Filer, Mercer, Pa.
S of H—2 Steam loco. and mules; track gauge 30 in.
S of M—Hand.
PP—4 Return tubular boilers, total 250 H. P. 1 compressor and 2 pumps.
EMP—126. Last fiscal year output, 59,930 tons. Sales agent, Harry J. Filer, Sharon, Pa.

PARK COAL CO.
Park Mine; Drift; Seam, 42 to 44 in. thick.
PO—Leechburg, Pa.; SP—Same; CTY—Armstrong; RR—P. R. R., Conemaugh Division.
PR—E. E. Ball, Leechburg, Pa.
TR—L. W. Hicks, " "
GM—L. W. Hicks, " "
PA—L. W. Hicks, " "
MS—Thos. Gulliford, "
CE—E. A. Watters, " "
S of H—1 Elec. loco.; track gauge, 42 in.
S of M—4 Elec. Mach.
PP—Power purchased.
EMP—50. Last fiscal year output 53,1200 tons.
Sales Agency, E. E. Ball.

PARKHILL COAL CO.
Ruth Mine; Drift; Upper Freeport Seam; 42 to 60 in. thick.
PO—Dawson, Pa.; SP—Same; CTY—Fayette; RR—B & O.
PR—David Scowfield.......Dawson, Pa.
TR—H. B. Moore, " "
GM—David Scowfield, " "
GS—David Scowfield, " "
PA—H. B. Moore, " "
CE—Thos. Zimmerman, Dawson, Pa.
S of H—Mules and gravity. Track gauge 42 in.
S of M—1 Elec. Mach.
PP—1 return tubular boiler, 100 H. P., 2 gen. units, 250 volts D. C.
EMP—6.
Capacity, 100 tons per day.

PARSHALL, W. J.
General Office, Uniontown, Pa.
Old Home Mine, Shaft and Slope.
PO—McClellandtown, Pa. SP—Leckrone. CTY—Fayette. RR—P. R. R., P. & L. E., B. & O.
GM—W.J.Parshall McClellandtown, Pa.
PA—W. J. Parshall, " "
EM—Fayette Eng. Co..Uniontown, Pa.
MS—Luke Shaw ..McClellandtown, Pa.
MF—Thomas Stewart, " "
S of H—Rope and mules.
S of M—6 comp. air mach.
PP—4 boilers, total 600 H. P.
Coke ovens, 100.

PATTON CLAY MANUFACTURING CO.
Patton Shaft, No. 3, Shaft, C Seam 3 ft. 10 in. to 4 ft. 2 in. thick.
PO—Patton, Pa., SP—Same, CTY—Cambria.
RR—N.Y.C. & H.R.R.R.
PR—H. F. Good........Patton, Pa.
TR—Ralph E. Good, " "
GM—Geo. E. Prindible, " "
PA—Geo. E. Prindible, " "
MS—John Choby, " "
CE—John T. Culp, " "
MM—John T. Sulp, " "
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—2 Keeler Water Tube and 1 Keeler return tubular boiler, total 625 H. P.
EMP—22. Last fiscal year output 4,000 tons.

PAUL COAL & SUPPLY CO.
General Office, 1765 W. Liberty ave., Pittsburgh, Pa.
Paul Mine; Drift, Pittsburgh Seam 54 to 68 in. thick.
PO—Pittsburgh, Pa.; SP—West Liberty, Pa.; CTY—Allegheny; RR—West Side Belt.
PR—J. A. Gormly, Meadowlands, Pa.
TR—J. C. Davis, 1765 W. Liberty Ave., Pgh., Pa.
GM—J. C. Davis, 1765 W. Liberty Ave., Pgh., Pa.
GS—J. C. Davis, 1765 W. Liberty, Ave., Pgh., Pa.
PA—J. C. Davis, 1765 W. Liberty Ave., Pgh., Pa.
S of H—Mules track gauge 42 in.
S of M—Hand and 1 elec. mining mach
PP—500 volts D. C. Purchase power.
EMP—18. Last fiscal year output 11,500 tons.

PAULTON COAL MINING CO.
General Office, Leechburg, Pa.
Paulton Mine, Slope.
PO—Apollo, Pa. SP—Same. CTY—Westmoreland. RR—P. R. R.
GM—L. W. Hicks.....Leechburg, Pa.
MS—Frank Walker, ...Vandergrift, Pa.
EM—E. A. Watters, ...Leechburg, Pa.
S of H—Rope and elec. loco.
S of M—Elec. mach.
PP—Power purchased. 8 pumps.
EMP—155. Last fiscal year output 61,851 tons.

PAWNEE COAL CO.
Pawnee Mine; Drift; Kittanning Seam, 42 to 48 in. thick.
PO—Brookville, Pa.; SP—Norman, Pa.; CTY—Jefferson RR—P. S. & N.
PR—C. C. Chittester, Brockwayville, Pa.
TR—J. T. Armstrong,...Kittanning, Pa.
PA—J. T. Armstrong, " "
GM—John Chilcott......Brookville, Pa.
GS—John Chilcott.......Brokville, Pa.
MS—Geo. Forsythe......Brookville, Pa.
CE—W. W. Henshey,...Kittanning, Pa.
EE—R. B. Myers.......Brookville, Pa.
S of H—Mules and Rope; track gauge, 42 in.
S of M—1 elec. mach.
PP—1 Du Bois water tube boiler, 150 H. P., 1 gen. unit, 250 volts D. C.
EMP—15. Last fiscal year output 564.03 tons.
Note—Idle during greater part of year. Now working.

P. C. & Y. COAL CO.
Thornburg Mine; Drift; Pittsburgh Seam, 58 to 68 in. thick.
PO—Crafton, Pa.; SP—Pike, Pa.; CTY—Allegheny; RR—P. C. & Y.
PR—B. S. Hammill........Crafton, Pa.
GM—B. S. Hammill, " "
PA—C. C. McGregor, " "
TR—C. C. McGregor, ...Crafton, Pa.
GS—C. C. McGregor, " "
MS—C. C. McGregor, " "

S of H—Mules. Track gauge 42 in.
S of M—4 elec. mach.
PP—Power purchased, 1 gen. unit, 250 volts D. C., 3 phase, 60 cycles. 3 pumps.
Output for three months 21,000 tons.

PEALE, PEACOCK & KERR, INC.
General Office, St. Benedict, Pa.
PR—Bembrandt Peale, St. Benedict, Pa.
VP—Richard Peale, " "
TR—W. B. Oakes, " "
PA—G. E. Metzger, " "
CE—Merritt Hutton, " "
EM—Merritt Hutton, " "
MM—E. Kent Davis, " "
EE—E. Kent Davis, " "
SM—E. F. Harvey, " "
SM—F. N. Artley, " "
EM—A. M. Dunsmore, " "
SB—Central Trading Corp. Buyer, E. F. Harvey, Philipsburg, Pa.

Nos. 1, 6 and 9 Mines, Drifts.
PO—Winburne, Pa. SP—Same. CTY—Clearfield. RR—N. Y. C. & H. R.
GS—R. H. George.....Winburne, Pa.
S of H—10 elec. locos.
S of M—10 elec. mach.
PP—6 boilers, total 900 H. P., gen. units, 250 volts D. C.
EMP—356.

Decatur Nos. 3, 7 and 8 Mines, Drifts.
PO—Philipsburg, Pa. SP—Same. CTY—Clearfield. RR—N. Y.C. & H. R.
PA—John C. Dunsmore.Philipsburg, Pa.
GS—John C. Dunsmore, " "
S of H—Mules.
S of M—Hand.
Glen Richey Nos. 1, 3, 4, 5, 6, 18 19 and 20 Mines, Drifts.
PO—Glen Richey, Pa. SP—Mitchell's Station, Pa. CTY—Clearfield. RR—N. Y. C. & H. R.
PA—G. E. Metzger ..St. Benedict, Pa.
GS—R. H. George .....Winburne, Pa.
S of H—2 elec. locos., rope and mules.
S of M—4 elec. mach. and hand.
PP—5 boilers, total 750 H. P., gen. units, 250 volts D. C.

PEARCE, GEO., & SON.
Excelsior 1 and 2; Slope and Drift; U. Freeport and L. Kittanning; 4 ft. thick.
PO—Puritan, Pa.; SP—Portage, Pa.; CTY—Cambria.
RR—P.R.R., Portage Branch.
GM—Robert Pearce......Puritan, Pa.
PA—Robert Pearce, "
MS—Geo. Pearce..........Portage, Pa.
EM—J. Sillyman & Co. .. Altoona, Pa.
SCO—Citizens Supply Co. Buyer, A. G. Groke, Puritan, Pa.
S of H—Ropes and mules; track gauge 36 in.
PP—2 tubular boilers total 150 H.P.
Sales Agent, G. W. Clark, Altoona, Pa.

PEERLESS COAL MINING CO.
General Office, Pennsylvania Bldg., Philadelphia, Pa.
Peerless No. 1; Drift; Miller Seam; 3 ft. thick.
PO—El Mora, Pa.; SP—Bakerton, Pa. CTY—Cambria.
RR—P.R.R., C. & C. Branch.
GM—John Wills.....Philadelphia, Pa.
PA—J. R. Hayes... ..El Mora, Pa.
MS—J. R. Hayes, " "
S of H—Mules.
S of M—Hand.
EMP—29. Last fiscal year output, 14,328 tons.
Sales Agent, John Wills, 703 Pennsylvania Bldg., Philadelphia, Pa.

PENFIELD COAL & COKE CO.
General Office, Penfield, Pa.
PR—S. C. Denham, Clarksburg, W.Va.
TR—V. L. Highland, " "
GM—L. W. Smith......Penfield, Pa.
PA—L. W. Smith, " "
EE—Thos. Walker, " "
EM—J. E. Fry..........Du Bois, Pa.
SCO—Penfield Supply Co. Buyer, L. W. Smith, Penfield, Pa.
Sales Agent, L. W. Smith, Penfield, Pa.

Penfield No. 1 Mine; Drift; Lower Kittanning Seam, 36 in. thick.
PO—Penfield, Pa., SP—Same CTY—Clearfield; RR—P. R. R.
MS—Hugh Wheeling......Penfield, Pa.
S of H—3 Elec. loco., track gauge 36 in.
S of M—Hand.
PP—2 Water tube boilers, total 300 H. P., 1 gen. unit, 220 volts D. C.
EMP—130. Last fiscal year output 43,229 tons.

Coalville No. 2 Mine; Drift; Lower Kittanning Seam; 42 in. thick.
PO—Weedville, Pa., SP—Same, CTY—Elk, RR—P. R. R.
MS—Harry Harley......Weedville, Pa.
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—1 water tube boiler, 80 H. P., 1 gen. unit, 220 volts D. C.
EMP—100. Last fiscal year output 32,871 tons.

PENKER COAL CO.
General Office, Houtzdale, Pa.
Penker Mine No. 1, Drift, Miller or "B" Seam 3 ft. 8 in. to 4 ft. 6 in. thick.
PO—Portage, Pa.; SP—Same; CTY—Cambria.
RR—P.R.R.
PR—Michael Burns....Houtzdale, Pa.
TR—Harry Moulton, " "
GM—H. M. McAlarney..Portage, Pa.
GS—H. M. McAlarney, " "
PA—H. M. McAlarney, " "
EM—Jos. Sillyman.....Altoona, Pa.
S of H—Gravity Incline and mules; track gauge 42 in.
S of M—Hand.
EMP—60. Last fiscal year output 58,100 tons.

PENN COKE CO.
Out of business.

PENN GAS COAL CO.
General Office, Philadelphia, Pa.
PR—S. Pemberton Hutchinson, Philadelphia, Pa.
TR—Geo. McCall....Philadelphia, Pa.
GS—J. J. Collier ....Irwin, Pa.
PA—W. F. Gallagher, " "
EM—J. W. Storey..........Irwin, Pa.

Penn No. 2 Mine, Shaft and Slope, Pgh. Seam, 67 in. thick.
PO—Irwin, Pa. SP—Same. CTY—Westmoreland. RR—P. R. R. Yough branch.
MS—Jos. W. Rymer........Irwin, Pa.
S of H—3 elec. locos. Track gauge 40¼ in.
S of M—11 comp. air mach.
PP—5 water tube and 2 return tubular boilers, total 1800 H. P., 2 air comp., 3 pumps.
EMP—450. Last fiscal year output 524,997 tons.

Penn No. 3 Mine, Shaft and Slope, Pgh. Seam, 67 in. thick. Operate washery.
PO—Lowber, Pa.; SP—Gratztown, Pa.; CTY—Westmoreland; RR—P. R. R., Yough branch.
MS—James Taylor........Lowber, Pa.
S of H—4 elec. locos. Track gauge40¼ ins.
S of M—9 elec. and 2 comp. air mach.
PP—9 Erie return tubular boilers, total 1,350 H. P., 2 air. comp., 2 pumps.
EMP—425. Last fiscal year output 507,604 tons.

Penn No. 5 Mine, Shaft and Slope, Pgh. Seam, 72 in. thick.
PO—Penn Sta., Pa. SP—Same. CTY—Westmoreland. RR—P. R. R.
MS—J. B. Smith.......Penn Sta., Pa.
S of H—2 elec. loco. Track gauge 40¼ in.
S of M—9 elec. machines.
PP—2 Erie return tubular boilers, total 200 H. P. Power purchased.
EMP—325. Last fiscal year output 349,950 tons.

PENN MARY COAL CO.
General Office, Morris Bldg., Philadelphia, Pa.
Penn Mary Nos. 1, 2 and 7 Mines; Drifts; D. or L. Freeport Seam; 36 to 48 in. thick.
PO—Heilwood, Pa.; SP—Same; CTY—Indiana; RR—P. R. R. & N. Y. C.
PR—E. C. Felton....Philadelphia, Pa.
TR—E. Stuart, " "
PA—W. B. Enck, " "
GM—E. E. Slick......Johnstown, Pa.
GS—H. J. Meehan......Heilwood, Pa.
EM—James Meehan, " "
MM—Wm. Mildon, " "
MS—T. R. Johns, " "
SCO—The Heilwood Co. Buyer, Jas. B. Eck, Heilwood, Pa.
S of H—16 elec. loco. Track gauge 42 in.
S of M—Hand and 44 elec. mach.
PP—6 Return tubular boilers, total 1800 H. P., 4 gen. units, 2200 volts A. C., 3 phase, 60 cycles, 250 volts D. C., 2 pumps.
EMP—750. Last fiscal year output, 692,000 tons.

PENN SMOKELESS COAL CO.
General Office, Union Bank Bldg., Pittsburgh, Pa.
Higasota Mine; Slope; "C" Seam, 54 to 72 in. thick.
PO—Jerome, Pa.; SP—Same; CTY—Somerset; RR—B. & O., Jerome Branch.
PR—Thurston Wright, Pittsburgh, Pa.
TR—John Gibson, Jr.......Boswell, Pa.
GM—John Gibson, Jr., " "
PA—John Gibson, Jr., " "
MS—B. F. Baldwin,... ..Jerome, Pa.
EM—C. E. Hurd,.........Boswell, Pa.
EE—Thos. Houlton, " "
S of H—Rope and 2 elec. loco.
S of M—3 elec. mach.
PP—Power purchased, 275 volts D. C., 1 pump.
EMP—65. Last fiscal year output 63,508 tons.

PENNSY COAL CO.
General Office, Franklin, Pa.
PR—Geo. C. Miller ....Franklin, Pa.
TR—D. D. Mallory .....Franklin, Pa.
PA—C. F. Heath, " "
SUPT—C. H. Haugh......Clarion, Pa.
EM—R. H. Sabin, " "
ASST S—W. E. Dayton, " "
SCO—The Peoples Supply Co., Ltd. Buyer, Geo. Getty, Summerville, Pa.
Gen. Sales agent, E. T. Bline, Prudential Bldg., Buffalo, N. Y.

Gordan Mine; No. 4; Drift; Lower Kittanning Seam; 32 to 48 in. thick.
PO—Clarion, Pa.; SP—Gordantown, Pa.; CTY—Clarion; RR—L. E. F. & C.
MS—William Maloney...Gordantown, Pa.
S of H—Elec. locos. Track gauge 36 in.
S of M—Hand and 2 elec. mach.
PP—Power furnished from No. 3 Mine.
EMP—44. Last fiscal year output 16,342 tons.

Reed Mine No. 7; Drift; Lower Kittanning Seam; 35 to 42 in. thick.
PO—Clarion, Pa.; SP—Alton, Pa.; CTY—Clarion; RR L. E. F. & C.
MS—James Wyse......Summerville, Pa.
S of H—3 elec. loco. Track gauge 36 in.
S of M—Hand and 2 elec. mach.
PP—Power furnished from No. 5 Mine.
EMP—45.
Note—Opened Jan. 1st, 1916.

Rodgers No. 3 Mine, Drift, Lower Kittanning Seam, 32 to 48 in. thick.
PO—Clarion, Pa. SP—Rodgers. Pa. CTY—Clarion. RR—L. E. F. and C. R. R.
MS—Wm. Madill ....Strattonville, Pa.
S of H—Mules and rope. Track gauge 36 in.
S of M—Hand, 4 Elec. and 4 comp air mach.
PP—2 Phoenix return tubular boilers, total 300 H. P., 1 gen. unit, 275 volts D. C., 1 air comp., 2 pumps.
EMP—90. Last fiscal year output 82,480 tons.

Cronk No. 5 Mine, Slope, Lower Kittanning Seam, 32 to 38 in. thick.
PO—Clarion, Pa. SP—Cronk, Pa. CTY—Jefferson; RR—L. E. F. & C.
MS—Wm. Nichols.....Summerville, Pa.
S of H—Mules. Track gauge 36 in.
S of M—Hand and 5 Elec. mach.
PP—2 return tubular boilers, total 300 H. P., 1 gen. unit, 275 volts D. C., 2 pumps.
EMP—75. Last fiscal year output 75,873 tons.

Hilltop No. 6 Mine; Slope; Lower Kittanning Seam, 30 to 36 in. thick.
PO—Clarion, Pa. SP—Carrier, Pa. CTY—Jefferson; RR—L. E. F. & C;
MS—W. D. Brooks...Summerville, Pa.
S of H—Mules. Track gauge 36 in.
S of M—Hand and 4 Elec. mach.
PP—1 pump, power furnished from No. 5 Mine.
EMP—88. Last fiscal year output 58,214 tons.

Dayton No. 10 Mine; Drift; Brookville Seam; 54 to 72 in. thick.
PO—Summerville, Pa.; SP—Carrier, Pa. CTY—Jefferson; RR—L. E. F. & C.
MS—Thos Madill......Summerville, Pa.
S of H—Mules, rope and Steam loco.; track gauge 36 in.
S of M—6 Comp. air mach.
PP—3 Return tubular boilers, total 300 H. P., 1 comp. 3 pumps; also purchase power.
EMP—95. Last fiscal year output 58,102 tons.

PENNSYLVANIA COAL & COKE CORPORATION.
General Office, 17 Battery Place, New York, N. Y.
PR—T. H. Watkins, New York, N.Y.
GM—T. H. Watkins, " "
TR—A. G. Edwards..New York, N.Y.
PA—S. W. Clark......Cresson, Pa.
EM—H. H. Hasler, " "
EE—A. J. Varrelmann, "
Sales Mgr. J. W. Searles. 17 Battery Place, New York, N. Y.

Ben's Creek Mine No. 1; Drift; L. Kittanning Seam.
PO—Ben's Creek, Pa.; SP—Same; CTY Cambria.
RR—P.R.R.
MS—R. D. Mainwaring..Cresson, Pa.
Last fiscal year output 41,973 tons

Ehrenfeld No. 3 and 8; Drift; L. Kittanning Seam and Up. Freeport.
PO—Ehrenfeld, Pa.; SP—Summerhill, Pa.; CTY—Cambria.
RR—P.R.R.
MS—W. B. Alexander..Ehrenfeld, Pa.
S of H—18 elec. loco.
S of M—25 elec. and 8 comp. air mach.
PP—5 boilers total 1250 H. P., 6 gen. units, 1 air compressor and 3 pumps.
EMP—586. Last fiscal year output 275,715 tons.

Amsbry No. 7 and 16 Mines; Drift; Up. Freeport Seam.
PO—Amsbry, Pa.; SP—Same, CTY—Cambria; RR—P. R. R.
MS—R. D. Mainwaring..Cresson, Pa.
S of H—2 Elec. loco.
S of M—6 elec. mach.
PP—2 Boilers, total 500 H. P., 1 gen. unit 250 volts, D. C., 2 pumps.
EMP—108. Coke ovens 55; Bee Hive.
Last fiscal year output 14,340 tons.

Cresson No. 9 Mine; shaft; Up. Freeport and L. Kittanning.
PO—Cresson, Pa.; SP—Same; CTY—Cambria; RR—P. R. R.
MS—R. D. Mainwaring...Cresson Pa,
S of H—4 elec. loco.
S of M—19 elec. mach.
PP—6 boilers total 900 H. P., 5 gen. units and 3 pumps.
EMP—184. Coke ovens, 100. Last fiscal year output 62,706 tons.

Gallitzin Mine No. 10; Slope; Up. Freeport Seam.
PO—Gallitzin, Pa.; SP—Same; CTY—Cambria.
RR—P.R.R.
MS—R. D. Mainwaring...Cresson Pa,
S of H—8 elec. loco.
S of M—19 elec. mach.
PP—3 boilers total 475 H. P., 2 gen. units and 2 pumps.
EMP—158. Coke ovens, 400. Last fiscal year output 224,389 tons.

Hastings Nos. 11, 12, 13 and 20 Mines; Drift; L. Freeport, Seam.
PO—Hastings, Pa.; SP—Same; CTY—Cambria.
MS—J. R. Nicholson..Marsteller, Pa.
S of H—2 elec. loco.
S of M—9 elec. and 12 comp. air mach.
PP—7 boilers total 915 H.P., 2 gen. units 250 volts D. C., 2 air compressors and 1 pump.
EMP—356. Coke ovens, 152, Bee Hive
Last fiscal year output 145,441 tons.

Nant-Y-Glo No. 14 Mine; Drift; L. Kittanning.
PO—Nant-Y-Glo, Pa; SP—Same.; CTY Cambria; RR—P. R. R.
MS—W. B. Alexander..Ehrenfeld, Pa.
S of H—4 elec. loco.
S of M—26 comp. air mach.
PP—5 boilers; total 650 H. P., 2 gen. units, 2 air compressors and 2 pumps.
EMP—213. Last fiscal year output 106,222 tons.

Beaverdale Mine No. 15; Shaft; L. Kittanning Seam.
PO—Beaverdale, Pa.; SP—Same; CTY Cambria; RR—P. R. R.
MS—W. B. Alexander..Ehrenfeld, Pa.
S of H—4 elec. loco.
S of M—7 elec. mach.
PP—5 boilers total 700 H. P., 2 gen. units and 1 boiler.
EMP—192. Last fiscal year output 36,297 tons.

Bennington No. 19 Mine; Slope; Up. Freeport Seam.
PO—Bennington, Pa.; SP—Same; CTY Blair. RR—P. R. R.
MS—R. D. Mainwaring...Cresson Pa,
PP—2 boilers, total 225 H. P.
EMP—51. 50 Bee Hive coke ovens.
Last fiscal year output 17,268 tons.

Moss Creek Nos. 21, 22; Drift; L. Freeport Seam.
PO—Marsteller, Pa.; SP—Spangler; CTY—Cambria; RR—N.Y.C. & H.R.
MS—J. R. Nicholson..Marsteller, Pa.
S of H—5 elec. loco.
S of M—13 elec. mach.
PP—3 boilers, total 700 H. P., 3 gen. units and 1 pump.
EMP—332. Coke ovens 180 Bee Hive.
Last fiscal year output 236,800 tons.

Spangler No. 25 Mine; Drift; L. Freeport Seam.
PO—Spangler, Pa.; SP—Same; CTY—Cambria; RR—P. R. R.
MS—J. R. Nicholson..Marsteller, Pa.
S of M—3 comp. air mach.
PP—2 boilers, total 120 H. P., 2 air compressors and 1 pump.
EMP—61. Last fiscal year output 11,395 tons.

(Continued on Next Page.)

Pennsylvania Coal & Coke Corp.—Cont.
Pardee Nos. 27, 28, 29, 39, 50, Flanagan Nos. 30, 36, Moshannon No. 33, 37, Ashcroft Nos. 34 and 35.
PO—Patton, Pa.; SP—Same; CTY—Cambria; RR—N. Y. C. & H. R.
MS—A. O. Sommerville...Patton, Pa.
S of H—6 elec. loco.
S of M—54 elec. and comp. air mach.
PP—18 boilers, total 12870 H. P., 5 gen. units 11 pumps.
EMP—118. Last fiscal year output 551,521 tons.

Arcadia Nos. 40, 41, 42, 43, 44; Drift; Up. Freeport and L. Kittanning Seam.
PO—Arcadia, Pa. SP—Same; CITY—Indiana; RR—N.Y.C & H.R.
MS—A. O. Sommerville......Patton, Pa.
S of H—3 Elec. and 3 steam loco.
S of M—3 Elec. mach.
PP—5 Boilers total 360 H.P.; 1 gen. unit and 2 pumps.
EMP—561. Last fiscal year output, 231,545 tons.

Winburne Nos. 45, 46, 47; Drift; Up. Freeport Seam.
PO—Winburne, Pa. SP—Same; CITY—Clearfield; RR—N.Y.C. & H.R.
MS—A. O. Sommerville......Patton, Pa.
S of H—13 Elec. loco.
S of M—10 Elec mach.
PP—6 Boilers, 900 H.P.. 2 gen. units 250 volts D.C. 11 pumps.
EMP—321. Last fiscal year output, 209,304 tons.

PENNSYLVANIA SALT MFG. CO.
General Office, Widener Bldg. Phila., Pa.
Natrona No. 1 Mine, Drift; Upper Freeport" Seam, 4 to 4½ ft. thick.
PO—Natrona, Pa. SP—Same. CTY—Allegheny. RR—P.R.R, Conemaugh Dit.
PR—Joseph Moore, Jr., Philadelphia, Pa.
TR—A. B. Rice, " "
GS—E. E. Armstrong.....Natrona, Pa.
PA—C. H. Clinton........Natrona, Pa.
MS—A. A. Mitchell, " "
SM—Mathews Crillman....Natrona, Pa.
S of H—3 Electric Locomotives. Track gauge 36 in.
S of M—7 Electric Machines.
PP—1 pump. Power from Chemica Works.
EMP—250. Last fiscal year output 196,870 tons.

PERRY COAL COMPANY
Perry Mine; Drift; Upper Freeport Seam; 36 to 48 in. thick.
PO—Valier, Pa.; SP—Same; CTY—Jefferson; RR—B. R. & P.
PR—A. P. Sutter.........Valier, Pa.
GM—A. P. Sutter, " "
GS—A. P. Sutter, " "
TR—E. H. Winslow, " "
PA—E. H. Winslow, " "
SCO—Valier Supply Co. " "
S of H—Rope; track gauge 42 in.
S of M—1 comp. air machine.
PP—2 water tube boilers, 1 air comp., 2 pumps.
Daily output, 200 tons.

PERRY COKE COMPANY
Perry Mine; Drift; Pittsburgh Seam; 96 in. thick.
PO—Perryopolis, Pa.; SP—Star Junction; CTY—Fayette; RR—P. & L. E., Elwell branch.
PR—John C. Neff, Empire Bldg., Pittsburgh, Pa.
TR—W. G. Rock, 1st Natl. Bank Bldg., Pittsburgh, Pa.
PA—W. G. Rock, 1st Natl. Bank Bldg., Pittsburgh, Pa.
GS—D. B. Millward...Perryopolis, Pa.
EM—L. C. Mechlin.....Uniontown, Pa.
S of H—Mules
S of M—Hand.
EMP—35. 30 Bee Hive Coke Ovens.

PETERS CREEK GAS COAL CO.
General Office, Oliver Bldg., Pgh., Pa.
Piney Fork Mine; Drift; Pgh. Seam, 36 to 72 in. thick.
PO—Finleyville, Pa.; R. F. D. No. 1; SP—Wilson, Pa.; CTY—Allegheny; RR—P. R. R., Peters Creek Br.
PR—C. W. Braznell....Pittsburgh, Pa.
GM—C. W. Braznell " "
GS—C. W. Braznell " "
PA—C. W. Braznell " "
TR—R. A. Braznell....Finleyville, Pa.
MS—R. A. Braznell " "
EM—F. B. Boyd, " "
EE—Jake Byers " "
SCO—Piney Fork Supply Co.; Buyer, John W. Conwell, Finleyville, Pa.
S of H—Mules, and 1 elec. loco. Track gauge 42 in.
S of M—2 Elec. mach.
PP—1 Erie return tubular boiler; 125 H. P., 1 gen. unit, 250 volts D. C. 1 pump.
EMP—70. Last fiscal year output 76,000 tons.

PHYLLIS MINING CO.
General Office, Cheat Haven, Pa.
Phyllis Mine; Pittsburgh Seam; 60 to 84 in. thick.
PO—Cheat Haven, Pa.; SP—Same; CTY—Fayette; RR—B. & O.
PR—K. McGough.....Cheat Haven, Pa.
TR—G. E. Albrecht " "
GM—G. E. Albrecht " "
GS—G. E. Albrecht " "
PA—G. E. Albrecht
S of H—Gravity.
Sales Mgr.—G. E. Albrecht, Cheat Haven, Pa.

PINE RUN COAL CO.
Nos. 1, 3 and 5 Mines; Drifts; Freeport Seam, 4 to 8 ft. thick.
PO—New Bethlehem, Pa.; SP—Hawthorn, Pa.; CTY—Clarion; RR—Pine Run.
PR—J. A. Beam, New Bethlehem, Pa.
PA—J. A. Beam, " "
GS—W. C. Beam, " "
TR—F. B. Layton.....Boston, Mass.
EM—A. L. Bouton......DuBois, Pa.
S of H—2 elec. and one gasoline loco. Track gauge 42 in.
S of M—10 elec. mach and hand.
PP—2 Erie return tubular boilers, total 300 H.P.; gen. unite 250 volts D.C.
Last fiscal year output 328,000 tons.
Note—Opening Mine No. 6 in L. Kittanning Seam, on Pine Run R. R.

PINE RUN CO.
Pine Run No. 2 Mine, Slope.
PO—Vandergrift, Pa. SP—Same. CTY—Westmoreland. RR—P. R. R.
GM—L. W. Hicks.....Leechburg, Pa.
MS—Frank Walker.....Vandergrift, Pa.
EM—E. A. Watters ....Leechburg, Pa.
S of H—Elec. locos.
S of M—Elec. mach.
PP—Power purchased. M. G. Set, 250 volts D. C. 1 pump.
EMP—170. Last fiscal year output 216,000 tons.

PIPER, W H & CO
General Office, Commercial Trust Bldg., Philadelphia, Pa.
Sonman No. 2 Mine; Slope; "B" or Miller Seam, 42 in. thick.
PO—Lilly, Pa. SP—Same. CTY—Cambria. RR—P. R. R. Lilly Branch.
GM—W. D. Piper......Philadelphia, Pa.
MS—Joseph Appleyard, Lilly, Pa.
S of H—Mules and rope, track gauge 42 in.
S of M—Hand.
PP—4 Water tube Stirling boilers, total 750 H.P. 1 gen. unit 250 volts D.C., 2 compressors and 3 pumps. Last fiscal year output, 191,041 tons.

PITT GAS COAL CO.
General Office, 707 Oliver Bldg., Pittsburgh, Pa.
Slope Mine, Pittsburgh Seam, 7 ft. thick.
PO—Millsboro, Pa.; SP—Bisco, Pa.; CTY—Washington; RR—P. R. R., P. V. and C. Branch.
PR—W. Y. Humphreys....Pittsburgh, Pa.
GM—W. Y. Humphreys, " "
TR—W. Y. Humphreys, " "
PA—Hiram Harris, " "
EM—Geo. S. Baton & Co., " "
EE—L. G. Moslener, ...Brownsville, Pa.
MS—T. F. Springer......Millsboro, Pa.
S of H—Mules.
S of M—2 Elec. mach.
PP—Power purchased, 1 pump.
EMP—70.
Sales Agency, W. H. Warner Co., Cleveland, O.

PITTSBURGH & BALTIMORE COAL CO
General Office, Pittsburgh, Pa.
Jas. D. O'Neil, R. P. Watt, Wm. K. Johnson, Receivers
PA—J. I. Boyd, Pittsburgh, Pa.
GM—E. L. Morris.......Pittsburgh, Pa.
GS—E. L. Morris.......Pittsburgh, Pa.
EM—H. M. Schmidt, " "
MM—Edw. Winning.
SCO—Penn Mercantile Co., Buyer, H. D. Bittner, Pittsburgh, Pa.

Edna No. 1 Mine; Slope; Pgh. Seam, 6 to 7 ft. thick.
PO—Adamsburg, Pa.; SP—Irwin, Pa. CTY—Westmoreland. RR—B. & O.
MS—Chas. Reynolds.....Adamsburg, Pa.
SM—R. G. Williams......Wendel, Pa.
S of H—Mules, rope, gravity and 5 Elec loco.; track gauge 42 in.
S of M—10 Elec. machines.
PP—4 Erie City return tubular boilers, total 600 H.P. 2 Gen. units 500 Volts, D.C. 1 pump. (Purchase about one-half power.)
EMP—197.

Edna No. 2, Shaft, Pittsburgh Seam, 6 to 7ft thick.
PO—Wendel, Pa.; SP—Same; CTY—Westmoreland; RR—B. & O.
MS—Jos. Kennedy.........Wendel, Pa.
SM—W. B. Clark, " "
S of H—Animal, and 4 Elec. loco. Track gauge 42 in.
S of M—11 Electric machines.
PP—8 Erie City return tubular boilers, total 1,200 H.P. 1 Gen. unit 500 volts D.C. 2 pumps. also purchase power.
EMP—274. Last fiscal year output 331,750 tons.

PITTSBURGH COAL CO.
General Office, Oliver Bldg., Pittsburgh, Pa.
PR—W. K. Field ....Pittsburgh, Pa.
TR—Wm. Miller, " "
CM—G. W. Schluederberg, " "
GM Asst—J. M. Armstrong, " "
EM—E. J. Taylor, " "
EE—A. B. Kiser, " "
PA—F. E. Now.
SCO—Federal Supply Co. Buyer, Mr. Phillips, Pittsburgh, Pa.

Albany Mine, Drift, Pgh. Seam.
PO—S. Brownsville, Pa. SP—Brownsville Junction, Pa. CTY—Fayette. RR—P. & L. E.
MS—J. S. Wilson....S. Brownsville, Pa.
S of H—1 elec. loco.
S of M—3 Elec. machines.
PP—3 boilers, total 300 H. P., gen. units, 250 volts, D. C.
EMP—184. Last fiscal year output 13,875 tons.

Alice Mine, Drift, Pgh. Seam.
PO—Roscoe, Pa. SP—East Roscoe, Pa. CTY—Washington. RR—P. & L. E.
MS—R. H. Nicholas..Fayette City, Pa.
S of H—3 elec. loco.
S of M—12 elec. mach.
PP—4 boilers, total 1,050 H. P.
EMP—362. Last fiscal year output 382,690 tons.

Allison Mine, Drift, Pgh. Seam.
PO—Houston, Pa. SP—Meadowlands, Pa. CTY—Washington. RR—P. C. C. & St. L.
MS—W. A. Lockhart....Houston, Pa.
S of H—1 elec. loco.
S of M—10 elec. mach.
PP—3 return tubular boilers, total 450 H. P., gen. units, 500 volts D. C. and 2 pumps.
EMP—Idle.

Apollo Mine, Drift, Pgh. Seam.
PO—Fayette City, Pa. SP—Same. CTY—Fayette. RR—P. & L. E.
MS—R. H. Nicholas..Fayette City, Pa.
S of H—2 elec. locos.
S of M—9 elec. mach.
PP—Power purchased, 3 pumps.
EMP—367. Last fiscal year output 108,782 tons.

Arnold No. 2 Mine, Shaft, Pgh. Seam.
PO—Arnold City, Pa. SP—Fayette City, Pa. CTY—Fayette. RR—P. & L. E.
MS—H. M. White.....Arnold City, Pa.
S of H—3 elec. locos.
S of M—2 elec. mach.
PP—6 return tubular boilers, total 900 H. P., gen. units, 500 volts D. C. and 4 pumps.
EMP—539. Last fiscal year output 553,193 tons.

Banning No. 1 Mine, Slope, Pgh. Seam.
PO—Van Meter, Pa. SP—Jacobs Creek Scales, Pa. CTY—Westmoreland. RR—P. & L. E.
MS—David Ferguson....Van Meter, Pa.
S of H—3 elec. locos.
S of M—13 elec. mach.
PP—4 return tubular boilers, total 600 H. P., 3 gen. units, 500 volts D. C. and 1 pump.
EMP—Idle.

Banning No. 2 Mine, Slope.
PO—Whitsett, Pa. SP—Whitsett Junction, Pa. CTY—Fayette. RR—P. & L. E.
MS—C. M. Snyder........Whitsett, Pa.
S of H—4 elec. locos.
S of M—17 elec. mach.
PP—10 return tubular boilers, total 1,500 H. P., gen. units, 500 volts D. C. and 2 pumps.
EMP—667. Last fiscal year output 877,625 tons.

Banning No. 3 Mine, Slope, Pgh. Seam.
PO—Van Meter, Pa. SP—Jacobs Creek Scales Pa. CTY—Westmoreland. RR—P. & L. E.
MS—David Ferguson....Van Meter, Pa.
S of H—2 elec. locos.
S of M—13 elec. mach.
PP—4 return tubular boilers, total 600 H. P., 3 gen units, 500 volts D. C.
EMP—424. Last fiscal year output 182,999 tons.

Black Diamond Mine, Drift, Pgh. Seam.
PO—Monongahela, Pa. SP—Black Diamond, Pa. CTY—Washington. RR—P. V. & C.
MS—L. Lindsey......Monongahela, Pa.
S of H—Elec. loco.
S of M—Elec. mach.
PP—6 boilers, total 900 H. P., gen. units 500 volts D. C.
EMP—365. Last fiscal year output, 100,076 tons.

Bridgeville Mine, Drift, Pgh. Seam.
PO—Bridgeville, Pa. SP—Same. CTY—Allegheny. RR—P. C. C. & St. L.
MS—S. P. McCaffrey...Bridgeville, Pa.
S of H—2 elec. locos.
S of M—11 elec. mach.
PP—Central plant, gen. units, 500 volts D. C., 2 pumps.
EMP—413. Last fiscal year output 383,508 tons.

Brier Hill Mine, Drift, Pgh. Seam.
PO—McDonald, Pa. SP—Same. CTY—Washington. RR—P. C. C. & St. L.
MS—Jas. Davidson.....McDonald, Pa.
S of H—1 elec. loco.
S of M—Elec. mach.
PP—Central plant, gen. units, 500 volts D. C., 3 pumps.
EMP—Idle.

Bunola Mine, Drift, Pgh. Seam.
PO—Monongahela, Pa. SP—Bunola, Pa. CTY—Washington. RR—P. & L. E.
MS—Lance Linsley....Monongahela, Pa.
S of H—4 elec. locos.
S of M—14 elec. mach.
PP—Power purchased, 4 pumps.
EMP—Idle.

Catsburg Mine, Drift, Pgh. Seam.
PO—Monongahela, Pa. SP—Same. CTY—Washington. RR—P. V. & C.
MS—L. Lindsey......Monongahela, Pa.
S of H—Elec. loco.
S of M—Elec. mach.
PP—Power purchased.
EMP—Idle.

Chamouni Mine, Pgh. Seam.
PO—So. Brownsville, Pa. SP—East California, Pa. CTY—Fayette. RR—P. & L. E.
MS—J. A. Wilson....S. Brownsville, Pa.
S of H—1 elec. loco.
S of M—2 elec. mach.
PP—2 return tubular boilers, total 200 H. P., gen. units 500 volts D. C. and 2 pumps.
EMP—153. Last fiscal year output 210,530 tons.

Champion Mine, Drift, Pgh. Seam.
PO—McDonald, Pa. SP—Sturgeon, Pa. CTY—Washington. RR—P. C. C. & St. L.
MS—Jas. Davidson ....McDonald, Pa
S of H—1 elec. loco.
S of M—12 elec. mach.
PP—3 return tubular boilers, total 450 H. P., gen. units, 500 volts D. C. 6 pumps.
EMP—387. Last fiscal year output 173,244 tons.

Cincinnati Mine, Pgh. Seam.
PO—Finleyville, Pa. SP—Courtney, Pa. CTY—Washington. RR—P. V. & C.
MS—Wm. Carter .....Finleyville, Pa.
S of H—Elec. locos.
S of M—Elec. mach.
PP—Power purchased.
EMP—Idle.

Coal Bluff Mine, Drift, Pgh. Seam.
PO—Finleyville, Pa. SP—Coal Bluff, Pa. STY—Washington. RR—P. V. & C.
MS—Wm. Carter......Finleyville, Pa.
S of H—1 elec. loco.
S of M—9 elec. mach.
PP—Power purchased.
EMP—229. Last fiscal year output 32,028 tons.

Creedmoor Mine, Shaft, Pgh. Seam.
PO—Cecil, Pa. SP—Same. CTY—Washington. RR—P. C. C. & St. L.
MS—Dan Davis.............Cecil, Pa.
S of H—2 elec. locos.
S of M—13 elec. mach.
PP—9 return tubular boilers, total 1,350 H. P., 5 gen. units, 500 volts D. C. and 1 pump.
EMP—308. Last fiscal year output 162,170 tons.

Crescent Mine, Drift, Pgh. Seam.
PO—California, Pa. SP—Same. CTY—Washington. RR—P. V. & C.
MS—Geo. Harkess......California, Pa.
S of H—22 elec. locos.
S of M—24 elec. mach.
PP—4 boilers, total 1,580 H. P. gen. units 500 volts D. C. and 8 pumps
EMP—1202. Last fiscal year output, 1,333,963 tons.

Dickson Mine, Drift, Pgh. Seam.
PO—Imperial, Pa. SP—Cliff Mine, Pa. CTY—Allegheny. RR—Montour.
MS—Wm. Garrett........Imperial, Pa.
S of H—1 elec. loco.
S of M—10 elec. mach.

PP—2 return tubular boilers, total 300 H. P., gen. units, 500 volts D. C. and 4 pumps.
EMP—272. Last fiscal year output 259,474 tons.

Eclipse Mine, Drift, Pgh. Seam.
PO—Roscoe, Pa. SP—Wood Run, Pa. CTY—Washington. RR—P. V. & C.
MS—Geo. Harkess.......California, Pa.
S of H—2 elec. loco.
S of M—12 elec. mach.
PP—Power purchased.
EMP—505. Last fiscal year output 369,625 tons.

Equitable Mine, Drift, Pgh. Seam.
PO—Webster, Pa. SP—Same. CTY—Westmoreland. RR—P. & L. E.
MS—Chas. McDaniel.....Webster, Pa.
S of H—1 elec. loco.
S of M—9 elec. mach.
PP—Power purchased, gen. units, 500 volts D. C. and 3 pumps.
EMP—426. Last fiscal year output 406,246 tons.

Essen No. 3 Mine, Drift, Pgh. Seam.
PO—Burdine, Pa. SP—Same. CTY—Allegheny. RR—P. C. & Y.
MS—Wm. Kirk...........Burdine, Pa.
S of H—2 elec. locos.
S of M—16 elec. mach.
PP—8 return tubular boilers, total 1,200 H. P., 7 gen. units, 500 volts D. C. and 3 pumps.
EMP—442. Last fiscal year output 353,462 tons.

Euclid Mine, Shaft, Pgh. Seam.
PO—Fitz Henry, Pa. SP—Same. CTY—Westmoreland. RR—B. & O.
MS—Wm. Blower ....Fitz Henry, Pa.
S of H—2 elec. locos.
S of M—10 elec. mach.
PP—5 return tubular boilers, total 750 H. P., 6 gen. units, 500 volts D. C. and 1 pump
EMP—210. Last fiscal year output 148,633 tons.

Eureka Mine, Drift, Pgh. Seam.
PO—Smithton, Pa. SP—Same. CTY—Westmoreland. RR—B. & O.
MS—Samuel McKay, ...Smithton, Pa.
S of H—1 elec. loco.
S of M—8 elec. mach.
PP—3 return tubular boilers, total 450 H. P., 3 gen. units, 500 volts D. C. and 5 pumps.
EMP—324. Last fiscal year output 325,255 tons.

Fair Haven Mine, Drift, Pgh. Seam.
PO—Broughton, Pa. SP—Horning, Pa. CTY—Allegheny. RR—W. S. B.
MS—Jas. Porter, ... Broughton, Pa.
S of H—5 elec. locos.
S of M—7 elec. mach.
PP—5 return tubular boilers, total 500 H. P., gen. units, 500 volts D. C. and 3 pumps.
EMP—195. Last fiscal year output 104,813 tons.

Fayette City Mine, Drift, Pgh. Seam.
PO—Fayette City, Pa. SP—Same. CTY—Fayette. RR—P. & L. E.
MS—R. H. Nicholas .Fayette City, Pa.
S of H—3 elec. locos.
S of M—11 elec. mach.
PP—Power purchased.
EMP—417. Last fiscal year output 410,357 tons.

First Pool No. 1 Mine, Drift, Pgh. Seam.
PO—Willock, Pa. SP—Same. CTY—Allegheny. RR—B. & O.
MS—H. D. Thomason....Willock, Pa.
S of H—1 elec. loco.
S of M—6 elec. mach.
PP—Power purchased, gen. units, 500 volts D. C. and 3 pumps.
EMP—Idle.

First Pool No. 2 Mine, Shaft, Pgh. Seam.
PO—Willock, Pa. SP—Same. CTY—Allegheny. RR—B. & O.
MS—H. D. Thomson ....Willock, Pa.
S of H—2 elec. locos.
S of M—13 elec. mach.
PP—5 return tubular boilers, total 850 H. P., gen. units, 500 volts D. C. and 5 pumps.
EMP—575. Last fiscal year output 484,110 tons.

Forest Hill Mine, Drift, Pgh. Seam.
PO—Smithdale, Pa. SP—Same. CTY—Allegheny. RR—P. & L. E.
MS—Carl Fetkenbaur.....Smithdale, Pa.
MS—R. C. Smith.....Smithdale, Pa.
S of H—3 elec. locos.
S of M—10 elec. mach.
PP—Central plant, 2 pumps.
EMP—354. Last fiscal year output 402,488 tons.

Gallatin Mine, Drift, Pgh. Seam.
PO—Gallatin, Pa. SP—Same. CTY—Allegheny. RR—P. & L. E.
MS—F. J. Counihan ....Gallatin, Pa.
S of H—3 elec. locos.
S of M—15 elec. mach.
PP—Central plant and 2 pumps.
EMP—418. Last fiscal year output 359,921 tons.

Grant Mine. Exhausted.

Harrison Mine, Drift, Pgh. Seam.
PO—Beadling, Pa. SP—Same. CTY—Allegheny. RR—P. C. & Y.
MS—W. H. Linsley.....Beadling, Pa.
S of H—4 elec. locos.
S of M—14 elec. mach.
PP—Power purchased and obtained from central plant, gen. units, 500 volts D. C.
EMP—525. Last fiscal year output 395,351 tons.

Idlewood Mine, Drift, Pgh. Seam.
PO—Loupurex, Pa. SP—Crafton, Pa. CTY—Allegheny. RR—P. C. C. & St. L.
S of H—1 elec. loco.
S of M—7 elec. mach.
PP—3 return tubular boilers, total 450 H. P., gen. units, 500 volts D. C.
Leased to F. T. Fitzharris.

Jumbo Mine. Exhausted.

Knob Mine, Drift, Pgh. Seam.
PO—So. Brownsville, Pa. SP—West Brownsville, Pa. CTY—Washington. RR—P. V. & C.
MS—J. A. Wilson,..S. Brownsville, Pa.
S of H—1 elec. loco.
S of M—2 elec. mach.
PP—5 boilers, total 200 H. P., gen. units 500 volts D. C. and 2 pumps.
EMP—191. Last fiscal year output 232,474 tons.

Laurel Hill No. 5 Mine, Shaft, Pgh. Seam.
PO—Cecil, Pa. SP—Gladden, Pa. CTY—Washington. RR—P. C. C. & St. L.
MS—Dan Davis.............Cecil, Pa.
S of H—Elec. loco.
S of M—Elec. mach.
PP—4 return tubular boilers, total 600 H. P., gen. units, 500 volts D. C. and 2 pumps.
EMP—Idle.

Lick Run Mine, Slope, Pgh. Seam.
PO—Broughton, Pa. SP—Bruceton, Pa. CTY—Allegheny, Pa. RR—B. & O.
MS—Jas. Porter, ... Broughton, Pa.
S of H—1 elec. loco.
S of M—13 elec. mach.
PP—4 return tubular boilers, total 600 H. P., gen. units, 500 volts D. C. and 2 pumps.
EMP—439. Last fiscal year output 224,142 tons.

Lovedale Mine, Drift, Pgh. Seam.
PO—Elizabeth, Pa. SP—Wylie, Pa. CTY—Allegheny. RR—P. & L.E.
MS—Wm. Pilkington.....Elizabeth, Pa.
S of H—Elec. locos.
S of M—11 elec. mach.
PP—Central plant and 2 pumps.
EMP—Idle.

Manown Mine, Drift, Pgh. Seam.
PO—Gallatin, Pa. SP—Manown, Pa. CTY—Allegheny. RR—P. & L. E.
MS—F. J. Counihan.....Gallatin, Pa.
S of H—1 elec. loco.
S of M—9 elec. mach.
PP—6 boilers, total 640 H. P., gen. units, 500 volts D. C. and 1 pump.
EMP—349. Last fiscal year output 304,421 tons.

Mansfield Mine, Drift, Pittsburgh Seam.
PO—Loupurex, Pa. SP—Carnegie, Pa. CTY—Allegheny. RR—P. C. C. & St. L.
MS—Thos. Clark........Loupurex, Pa.
S of H—5 elec. loco.
S of M—17 elec. mach.
PP—Central plant, gen. units, 500 volts D. C.
EMP—583. Last fiscal year output 450,205 tons.

Margerum Mine, Drift, Pittsburgh Seam.
PO—Imperial, Pa. SP—Same. CTY—Allegheny. RR—Montour.
MS—Wm. Garrett........Imperial, Pa.
S of H—2 elec. locos.
S of M—10 elec. mach
PP—Central plant and 7 pumps.
EMP—330. Last fiscal year output 284,138 tons.

Midland No. 1 Mine, Drift, Pgh. Seam.
PO—Houston, Pa. SP—Palanka, Pa. CTY—Washington. RR—P. C. C. & St. L.
MS—W. A. Lockhart ....Houston, Pa.
S of H—Elec. loco.
S of M—15 elec. mach.
PP—Power purchased and obtained from central plant, gen. units, 500 volts D. C. and 15 pumps.
EMP—400. Last fiscal year output 275,646 tons.

Midland No. 3 Mine, Drift, Pgh. Seam.
PO—Houston, Pa. SP—Westland, Pa. CTY—Washington. RR—P. C. C. & St. L.
MS—W. A. Lockhart ....Houston, Pa.
S of H—2 elec. loco.
S of M—16 elec. mach.
PP—Power purchased and obtained from central plant, gen. units, 500 volts D. C.
EMP—Idle.

Mongah Mine, Pgh. Seam.
PO—Monongahela, Pa. SP—Brownsdale, Pa. CTY—Washington. RR—P. & L. E.
MS—Lance Linsley....Monongahela, Pa.
S of H—2 elec. locos.
S of M—1 elec. mach.
PP—Power purchased, 1 pump.
EMP—399. Last fiscal year output 380,116 tons.

Montour No. 1 Mine, Shaft, Pgh. Seam.
PO—McDonald, Pa. SP—South View, Pa. CTY—Washington. RR—Montour.
MS Geo. Steinheiser.....McDonald, Pa.
S of H—Elec. loco.
S of M—Elec. mach.
PP—Buy power.
EMP—679. Last fiscal year output 395,149 tons.

Montour No. 2 Mine, Shaft, Pgh. Seam.
PO—Cecil, Pa. SP—Cowden, Pa. CTY—Washington. RR—Montour.
MS—Howard Burns.........Cecil, Pa.
S of H—Elec. loco.
PP—Power purchased.
EMP—533. Last fiscal year output 328,906 tons.

Montour No. 4 Mine, Shaft.
PO—Lawrence, Pa. SP—Hyland, Pa. CTY—Washington. RR—Montour.
MS—James J. Kerr......Lawrence, Pa
S of H—Elec. loco.
PP—Power purchased.
EMP—257. Last fiscal year output 119,245 tons.

Moon Run Mine.
PO—Moon Run, Pa. SP—Same. CTY—Allegheny. RR—Pgh. & Moon Run.
MS—Samuel Pritchard..Moon Run, Pa.
S of H—7 elec. loco.
PP—7 return tubular boilers, total 1,050 H. P., and 7 pumps.
EMP—962. Last fiscal year output 803,029 tons.

Nottingham Mine.
PO—Finleyville, Pa. SP—Hackett, Pa. CTY—Washington. RR—B. & O.
MS—Wm. Carter, ... Finleyville, Pa.
S of H—1 elec. and 1 steam loco.
S of M—10 elec. mach.
PP—3 return tubular boilers, total 450 H. P. and 7 pumps.
EMP—Idle.

Ocean No. 2 Mine, Drift, Pgh. Seam.
PO—Scott Haven, Pa. SP—Same. CTY—Westmoreland. RR—P. & L. E.
MS—Edw. Ryan .....Scott Haven, Pa.
S of H—Elec. locos.
S of M—12 elec. mach.
PP—Central plant, gen. units, 500 volts D. C. and 7 pumps.
EMP—514. Last fiscal year output 486,688 tons.

Ocean No. 5 Mine, Drift, Pgh. Seam.
PO—Smithdale, Pa. SP—Same. CTY—Allegheny. RR—P. & L. E.
MS—Carl Fetkenhaur....Smithdale, Pa.
S of H—2 elec. loco.
S of M—10 elec. mach.
PP—Central plant, gen. units, 500 volts D. C. and 2 pumps.
EMP—410. Last fiscal year output 420,708 tons.

Partridge Mine, Drift, Pgh. Seam.
PO—Imperial, Pa. SP—North Star, Pa. CTY—Allegheny. RR—Montour.
MS—Wm. Garrett........Imperial, Pa.
S of H—4 elec. loco.
S of M—29 elec. mach.
PP—7 return tubular boilers, total 950 H. P., gen. units, 500 volts D. C. and 10 pumps.
EMP—502. Last fiscal year output 429,811 tons.

Risher Mine, Pgh. Seam.
PO—Dravosburg, Pa. SP—Same. CTY—Allegheny. RR—Union.
MS—Thomas Watkins..Dravosburg, Pa.
S of H—4 elec. locos.
S of M—12 elec. mach.
PP—5 return tubular boilers, total 625 H. P., gen. units, 250 volts D. C. and 3 pumps.
EMP—150. Last fiscal year output 135,809 tons.

Shaner Mine, Drift, Pgh. Seam.
PO—Yohogany, Pa. SP—Guffey, Pa. CTY—Westmoreland. RR—B. & O.
MS—Alex McClymont...Yohoghany, Pa.
S of H—2 elec. loco.
S of M—Elec. mach.
PP—4 return tubular boilers, total 600 H. P., gen. units, 500 volts D. C. and 3 pumps.
EMP—287. Last fiscal year output 273,568 tons.

Somers Nos. 2 and 4 Mines, Pgh. Seam.
PO—Pricedale, Pa. SP—Bellevernon, Pa. CTY—Westmoreland. RR—P. & L. E.
MS—Thos. Easton......Pricedale, Pa.
S of H—4 elec. loco.
S of M—13 elec. mach.
PP—Central plant, gen. units, 500 volts D. C. and 10 pumps.
EMP—463. Last fiscal year output 488,722 tons.

Shaw Mine; Drift; Pgh. seam.
PO—Midway, Pa.; SP—Same; CTY—Washington. RR—P. C. C. & St. L.
MS—Wm. Garrett........Imperial, Pa.
S of H—Elec. loco.
S of M—Elec. mach.
PP—Power purchased, gen. units, 500 volts D. C.
EMP—Idle.

Sunnyside Mine, Slope, Pgh. Seam.
PO—Gallatin, Pa. SP—Milesville, Pa. CTY—Allegheny. RR—P. & L. E.
MS—F. J. Counihan....Gallatin, Pa.
S of H—3 elec. locos.
S of M—12 elec. mach.
PP—Central plant, gen. units, 500 volts D. C. and 1 pump.
EMP—407. Last fiscal year output 403,188 tons.

Tremont Mine, Slope, Pgh. Seam.
PO—Arnold City, Pa. SP—Tremont, Pa. CTY—Allegheny. RR—P. & L. E.
MS—H. M. White....Arnold City, Pa.
S of H—2 elec. locos.
S of M—12 elec. mach.
PP—Power purchased, 3 pumps.
EMP—458. Last fiscal year output 505,602 tons.

Walton Mine, Drift, Pgh. Seam.
PO—West Elizabeth, Pa. SP—Floreffe, Pa. CTY—Allegheny. RR—P. V. & C.
MS—John Young ..West Elizabeth, Pa.
S of H—1 elec. loco.
S of M—8 elec. mach.
PP—Central plant, gen. units, 250 volts D. C. and 2 pumps.
EMP—328. Last fiscal year output 294,825 tons.

Waverly Mine; Shaft; Pgh. Seam.
PO—Smithton, Pa.; SP—Same; CTY—Westmoreland; RR—B. & O.
MS—Samuel McKay.....Smithton, Pa.
S of H—Elec. loco.
S of M—7 Elec. mach.
PP—Power purchased; gen units 500 volts D. C. and 3 pumps.
EMP—250. Last fiscal year output 65,771 tons.

West Newton Mine, Shaft. Pgh. Seam.
PO—West Newton, Pa.; SP—Same; CTY—Westmoreland; RR—P. & L. E.
MS—John Houser....West Newton, Pa.
S of H—1 Elec. loco.
S of M—9 Elec. mach.
PP—Power purchased, gen. units 500 volts D. C. and 5 pumps.
EMP—303. Last fiscal year output 199,212 tons.

Wickhaven Mine; Shaft; Pgh. Seam.
PO—Whitsett, Pa.; SP—Wick Haven, Pa.; CTY—Fayette; RR—P.&L.E.
S of H—2 Elec. loco.
S of M—8 Elec. mach.
PP—Central plant, gen. units 500 volts D. C.
EMP—Idle.

Yough No. 2 Mine, Drift.
PO—Elizabeth, Pa. SP—Boston, Pa. CTY—Washington. RR—P. & L. E.
MS—Wm. Pilkington.....Elizabeth, Pa.
S of H—3 elec. locos.
S of M—12 elec. mach.
PP—6 boilers, total 605 H. P., gen. units, 250 volts D. C. and 2 pumps.
EMP—Idle.

Yough Slope Mine; Slope; Pgh. Seam.
PO—West Newton, Pa.; SP—Same; CTY—Westmoreland; RR—B. & O.
MS—John Houser....West Newton, Pa.
S of H—1 Elec. loco.
S of M—7 Elec. mach.
PP—3 Return tubular boilers, total 450 H. P., gen. units 500 volts D. C. and 4 pumps.
EMP—277. Last fiscal year output 157,139 tons.

PITTSBURGH & EASTERN COAL CO.
General Office, Leader News Bldg., Cleveland, O.
Mines Nos. 1, 2, and 3, Shaft; "Pittsburgh" or "Panhandle" Seam, 5 ft. thick.
PO—Chery Valley, Pa. SP—Same. CTY—Washington. RR—P. C.C. & St. L.
PR—D. R. Hanna,.. ..Cleveland, O
TR—C. H. Hanna, " "
GM—Michael Gallagher, " "
PA—T. F. Cadden, " "
MS—Robt. McKinney, Cherry Valley,Pa.
S of H—Mules and 5 Electric Locomotives. Track gauge 36 in.
S of M—35 Elec. Mach.
PP—17 Return tubular boilers.
EMP—900. Last fiscal year output 620,000 tons.

PITTSBURGH & ERIE COAL CO
General Office, Erie, Pa.
GS—T. F. Whalen,... Pittsburgh, Pa.
PA—T. F. Whalen, Pittsburgh, Pa.
SCO—Erie Supply Co. Buyer, T. F. Whalen.

Sumner No. 2, Slope, Pittsburgh Thick vein, 6 to 9 ft. thick.
PO—Braznell, Pa.; SP—Same, CTY—Fayette. RR—P.V. & C., Redstone Branch.
MS—James Henderson, Braznell Pa.
SM—G. G. Glotfelty, Braznell, Pa.
S of H—Rope, Mules and 3 Elec. loco. Track gauge 42 inch.
S of M—Hand, and 7 Elec. machines.
PP—3 Erie City, and 1 Union Iron Works return tubular boilers, total 650 H P 2 Gen. units, 250 volts, D. C., 2 pumps.
EMP—330 Last fiscal year's output 371,745 tons.

Erie No. 1, Drift, Pittsburgh Thick vein, 4 to 6 ft. thick.
PO—Burgettstown, Pa.; SP— Same; CTY—Washington. RR—P. C. C. & St.L., Burgettstown Branch.
MS—Jules Waterloo...Burgettstown, Pa.
S of H—Rope, and 6 Elec. loco., track gauge 42 in.
S of M—Hand, and 13 Elec. machines.
PP—3 Union Iron Works return tubular boilers, total 500 H.P. 2 Gen. units, 250 volts D.C. 2 pumps.
EMP—239. Last fiscal year's output 265,378 tons.

PITTSBURGH GAS COAL CO.
General Office, Punxsutawney, Pa.
Iselin Nos. 1, 2, 3, 4 and Fritz No. 2 Mines; Drift; Pgh. Seam, 44 to 66 in. thick.
PO—Iselin, Pa.; SP—Same; CTY—Indiana; RR—B. R. & P.
PR—L. W. Robinson, Punxsutawney, Pa.
TR—F. G. St. Clair....Du Bois, Pa.
GM—F. M. Fritchman..Indiana, Pa.
CE—Geo. W. Brymer, " "
PA—H. C. Smith, Punxsutawney, Pa.
EE—L. W. Householder, " "
MS—W. R. Wardrop.......Iselin, Pa.
SCO—Ridge Supply Co., Mgr. J. F. Campbell, Iselin, Pa.
S of H—26 elec. loco.
S of M—22 elec. mach.
PP—12 boilers.
EMP—1526.

PITTSBURGH PLATE GLASS CO. (Coal Dept.)
General Office, Pittsburgh, Pa.
Creighton Coal Works, Drift; Freeport Seam, 84 to 48 in. thick.
PO—Creighton, Pa. SP—Same. CTY—Allegheny; RR—P.R.R., Conemaugh Div.
PR—W. L. Clause, Pittsburgh, Pa.
TR—Edward Pitcairn. Pittsburgh, Pa.
PA—J. F. Cargill, Pittsburgh, Pa.
CE—J. H. Fox, Pittsburgh, Pa.
EM—V. L. Henry, Creighton. Pa.
MS—Chas. E. Craig, Creighton, Pa.
S of H—9 Elec. loco.; track gauge 42 in.
S of M—9 Elec. mach.
PP—3 Return tubular boilers, total 250 H. P., 2 gen. units 250 volts D. C., 6 pumps; also purchase power.
EMP—243. Last fiscal year output 179,448.88 tons. Sales agent Edward Pitcairn, Pittsburgh, Pa.

PITTSBURGH & SOUTHWESTERN COAL CO.
General Office, Greensburg, Pa.
Donahoe Mine, Slope, Pittsburgh Seam 48 to 72 in. thick.
PO—Avella, Pa. SP—Same. CTY — Washington. RR—Wabash Pittsburgh Terminal.
PR—Thos. Donohoe, Oliver Bld'g., Pgh., Pa.
TR—A. M. Gardner.........Avella, Pa.
GM—A. M. Gardner, Avella, Pa.
PA—A. M. Gardner, " "
MS—A. M. Gardner, " "
EM—Harrop Hopkins & Taylor, Pgh. Pa.
MM—W. M. Getty.........Avella, Pa.
S of H—Rope and mules; track gauge 40 in.
S of M—16 Comp. Air Machines.
PP—2 Erie Return Tubular Boilers, total 300 H.P. 1 Air Comp. and 1 pump.
EMP—125. Last fiscal year output 100,000 tons. Sales Agent, Thos. Donohoe, Pgh., Pa.

PITTSBURGH & SUSQUEHANNA COAL CO.
Altoona, Pa.
PR—T. S. Barrett........Altoona, Pa.
TR—J. H. Hoffman, " "
No report.

PITTSBURGH TERMINAL RAILROAD & COAL CO.
General Office, Wabash Bldg., Pittsburgh, Pa.
PR—W. W. Keefer, ..Pittsburgh, Pa.
GM—W. W. Keefer, " "
GS—W. W. Keefer, " "
TR—N. T. Davy, " "
PA—H. W. Nethken, " "
EM—Dwight Gerber, " "
EE—Wm. Singleton, " "
MM—William Singleton, " "
SCO—Mutual Supply Co., Buyer H. W. Nethken, Pittsburgh, Pa. Sales Agency, B. Nicoll & Co., New York, N. Y.

Nos. 1 and 2 Mines: Shaft; Pgh. Seam, 62 to 68 in. thick.
PO—Castle Shannon, Pa. SP—Same. CTY—Allegheny. RR—West Side Belt.
MS—John Mahony, Castle Shannon, Pa.
S of H—5 Elec. loco. and mules. Track gauge 44 in.
S of M—19 Elec. mach. and hand.
PP—6 pumps, power from Central plant at No. 4 mine.
EMP—(1) 680; (2) idle. Last fiscal year output 549,809 tons.

No. 3 Mine; Shaft; Pgh. Seam 62-68 in. thick.
PO—Mollenauer, Pa. SP—Benicoll, Pa. CTY—Allegheny. RR—West Side Belt.
MS—John Mahony, Castle Shannon, "
S of H—9 Elec. loco and mules, Track gauge 44 in.
S of M—19 Elec. mach. and hand.
PP—3 pumps. Power from Central Plant at No. 4 Mine.
EMP—739. Last fiscal year output 568,218 tons.

No. 4 Mine, Shaft; Pgh. Seam, 64-72 in. thick.
PO—Horning, Pa. SP—Same. CTY—Allegheny. RR—West Side Belt.
MS—George T. Akins, ..Horning, Pa.
S of H—5 Elec. loco. and mules. Track gauge 44 in.
S of M—12 Elec. mach. and hand.
PP—4 Babcock & Wilcox water tube boilers, total 2408 H. P., 2 gen units 2300 volts A. C., 3 phase, 60 cycles, 1 compressor, and 3 pumps. Central plant furnishes power to Mines 2, 3, 4, 6 and 7.
EMP—580. Last fiscal year output 286,311 tons.

No. 5 Mine; Pgh. Seam, 64-72 in. thick.
PO—Horning, Pa.; SP—Same; CTY—Allegheny; RR—West Side Belt.
MS—George T. Atkins....Horning, Pa.
Track gauge 44 in. Idle March, 1914.

No. 6 Mine; Drift; Pgh. Seam; 62-64 in. thick.
PO—Bruceton, Pa.; SP—Same; CTY—Allegheny; RR—West Side Belt.
MS—Leonard Hoyland.....Horning, Pa.
S of H—6 Elec. loco. and mules; track gauge 44 in.
S of M—18 Elec. mach. and hand.
PP—2 Pumps. Power from Central plant at Mine No. 4.
EMP—688. Last fiscal year output 560,230 tons.

No. 7 Mine; Drift; Pgh. Seam, 62-71 in. thick.
PO—Large, Pa.; SP—Same; CTY—Allegheny; RR—West Side Belt.
MS—John North............Large, Pa.
S of H—14 Elec. loco. and mules; track gauge 44 in.
S of M—18 Elec. mach. and hand.
PP—5 Pumps. Power from Central plant at No. 4 Mine.
EMP—687. Last fiscal year output 388,712 tons.

PITTSBURGH-WESTMORELAND COAL CO.
General Office, Fulton Bldg., Pittsburgh, Pa.
PR—H. A. Kuhn......Pittsburgh, Pa.
CF—H. A. Kuhn, " "
TR—E. S. Wallace, " "
GM—H. K. Knopf, " "
PA—H. K. Knopf, " "
EM—H. K. Knopf, " "
MM—H. K. Knopf, " "
SCO—Miners Supply Co., buyer W. S. McElhose, Pittsburgh, Pa.
Sales Agents, H. A. Andrews and T. S. Baillie, Pittsburgh, Pa.

Hazel Kirk Nos. 1 and 3; Shaft and Slope; Pgh. Seam, 6 ft. thick.
PO—Ivanhoe, Pa.; SP—Hazel Kirk, Pa.; CTY—Washington; RR—P. V. & C., Ellsworth Br.
MS—Wm. Bird..Monongahela City, Pa.
SM—John Evans........Scottdale, Pa.
S of H—3 elec. loco. and mules. Track gauge 42 in.
S of M—13 Elec. mach.
PP—3 Return tubular boilers, total 450 H. P., 4 gen. units and 4 pumps.
EMP—239. Last fiscal year output 192,558 tons.

Hazel Kirk No. 2 Mine; Shaft; Pgh. Seam, 6 ft. thick.
PO—Van Voorhis, Pa.; SP—Same; CTY—Washington; RR—P. V. & C. Ellsworth Branch.
SM—O. Willey.....Van Voorhis, Pa.
S of H—3 Elec. loco. and mules; track gauge 42 in.
S of M—9 Elec. mach.
PP—3 Return tubular boiler, total 450 H. P., 2 gen. units and 2 pumps.
EMP—355. Last fiscal year output 277,103 tons.

Penn Manor No. 1 Mine; Shaft; Pgh. Seam; 6 ft. thick.
PO—Manor, Pa.; SP—Same; CTY—Westmoreland; RR—P.R.R. Main Line.
MS—Jas.G.Ferguson, Harrison City, Pa.
S of H—Rope and mules. Track gauge 39 in.
S of M—6 Elec. mach.
PP—4 Return tubular and 4 cyndrical boilers, total 710 H. P. and 3 pumps.
EMP—304. Last fiscal year output 271,825 tons.

Penn Manor No. 5 Mine; Slope; Pgh. Seam, 6 ft. thick.
PO—Claridge, Pa.; SP—Same; CTY—Westmoreland; RR—P. R. R.
MS—W. H. Dewalt..Harrison City, Pa.
S of H—Rope and mules.
S of M—7 Elec. mach.
PP—3 Return tubular boilers, total 450 H. P., 2 gen. units and 3 pumps.
EMP—194. Last fiscal year output 162,348 tons.

Shoenberger Mine; Drift; Pgh. Seam 6 ft. thick.
PO—Baird, Pa.; SP—Same; CTY—Washington; RR—P. R. R., Monongahela Div.
MS—Wm. S. Lewis, Monon. City, Pa.
SM—John Bell, " "
S of H—5 Elec. loco.; track gauge 42 in.
S of M—14 Elec. machines.
PP—9 return tubular boilers, total 1150 H. P., 6 units and 2 pumps.
EMP—285. Last fiscal year output 282,762 tons.

Acme No. 2; Slope; Pgh. Seam, 6 ft. thick.
PO—Bentleyville, Pa. SP—Same. CTY—Washington; RR—P. V. & C., Ellsworth Branch.
MS—J. E. Hackett..Bentleyville, Pa.
SM—J. A. Kensinger, " "
S of H—Elec. loco., mules and rope; track gauge 44 in.
S of M—Elec. mach.
PP—6 Return tubular boilers, total 900 H. P., 8 gen. units and 3 pumps.
EMP—462. Coke ovens 300 Rectangular. Last fiscal year output 335,821 tons.

Preston Mine; Drift; Clarion Seam.
PO—W. Monterey, Pa.; SP—Same; CTY—Clarion; RR—P.R.R., Allegheny Valley Div.
MS—W. M. Whitley.W. Monterey, Pa.
S of H—Mules.
S of M—Comp. air mach.

PP—2 Return tubular boilers, total 225 H. P. and 1 pump.
EMP—38. Last fiscal year output 681.

PLUMER COKE CO.
General Office, Uniontown, Pa.
Plumer Mine; Slope; Pittsburgh Seam, 96 to 108 in. thick.
PO—McClellandtown, Pa.; SP—Leckrone, Pa.; CTY—Fayette; RR—Monon.
PR—A. Plumer Austin...Uniontown, Pa.
TR—R. W. Austin, " "
PA—R. W. Austin, " "
GM—G. B. Gilmore..Uniontown, Pa.
EM—South Penn Eng. Co. " "
MS—E. W. Eberly.McClellandtown, Pa.
MS—Jos. Panzura. McClellandtown, Pa.
S of H—Mules and rope. Track gauge 42 in.
S of M—Hand.
PP—1 engine, 700 volts D. C., 200 volts A. C., 2 phase, 60 cycles, 2 pumps. Purchase power.
EMP—70. Daily output 200 tons.
Coke ovens 72 Bee Hive.

PLYMOUTH COAL MINING CO
General Office, Philadelphia, Pa. ....
Plymouth Mine, Drift Mine, C prime Seam.
PO—Portage, Pa. SP—Same. CTY Cambria. RR—P.R.R.
PR—Roy A. Hatfield, Philadelphia, Pa.
TR—Jos. T. Hilles, Philadelphia, Pa.
GM—A. Bathgate.........Rosebud, Pa.
GS—Thomas M. Forsythe, Portage.
S of H—Mules.
S of M—Hand.
PP—1 Return Tubular Boiler, total 80 H.P..
EMP—200.
Sales Agents, Hatfield & Hilles, Philadelphia, Pa.

POLAND COAL CO.
General Office, House Bldg., Pittsburgh, Pa.
Poland No. 1 Mine; Slope; Pittsburgh Seam. 60 to 108 in. thick.
PO—Pt. Marion, Pa.; SP—Poland, Pa.; CTY—Fayette; RR—Monongahela.
PR—Julian Kennedy....Pittsburgh, Pa.
TR—John O. Miller, " "
GM—R. C. Crawford, " "
PA—G. D. Anderson, " "
MS—John M. Crawford, Point Marion, Pa.
CE—John M. Rayburn, Pittsburgh, Pa.
MM—Gilbert Collins......Dunkard, Pa.
EE—Lewis Downey, " "
SCO—Poland Supply Co., Buyer B. A. Campbell, Pt. Marion, Pa.
S of H—3 elec. loco. Track gauge 42 in.
S of M—4 elec. mach.
PP—4 Return tubular boilers, total H. P. 500; 2 gen. units, 250 volts D. C., 1 pump.
EMP—95. Last fiscal year output 51,836 tons.
Cake Ovens, 101,
Sales Manager, Geo. Forney, Pittsburgh, Pa.

PORTAGE COAL MINING CO.
General Office, St. Benedict, Pa.
Portage No. 2 Mine; Slope; C Prime Seam; 39 to 56 in. thick.
PO—Portage, Pa.; SP—Same; CTY—Cambria; RR—P. R. R., Martins Br.
PR—Rembrandt Peale,
Grand Central Terminal, New York, N.Y.
TR—Wm. B. Oaks,
Grand Central Terminal, New York, N.Y.
GM—Richard Peale...St. Benedict, Pa.
GS—Richard Peale, " "
PA—G. E. Metzger, " "
GS—A. M. Dunsmore, " "
EM Meritt Hutton, " "
MS—J. W. Haddick.......Portage, Pa.
EE—E. K. Davis........Spangler, Pa.
SCO Portage Trading Co., Portage, Pa. Buyer, W. H. Harvey, St. Benedict, Pa.
S of H—Rope and 7 elec. locos. Track gauge 36 in.
S of M—6 elec. and 4 comp. air mach.
PP—1 Babcock & Wilcox water tube boiler, 2 Keeler return tubular boilers, total 575 H. P., 1 air comp., 4 pumps and purchase power.
EMP—286. Last fiscal year output 266,560 tons.

POTTER, BIGLER & POTTER, INC.
General Office, Clearfield, Pa.
Horse-Shoe and Mt. Carmel Mines, Drift, "B" Seam, 3½ ft. thick.
PO—Karthaus, Pa. SP—Same. CTY—Clearfield.
GM—A. M. Bigler.......Clearfield, Pa.
GM—A. M. Bigler, " "
PA—W. B. Potter, Karthaus, Pa.
MS—G. H. Lewis, Karthaus, Pa.
S of H—Mules track gauge 36 in.
S of M—Hand.
EMP—50.

POTTS RUN LAND CO
General Office, Clearfield, Pa.
Potts Run Nos. 2 and 3 Mines; Drifts; "B" Seam, 48 to 56 in. thick.
PO—Boardman, Pa.; SP—Same; CTY—Clearfield; RR—N. Y. C. & H. R.
PR—A. B. Kerr, New York City.
TR—F. B. Kerr, Clearfield, Pa.
GM—F. B. Kerr, " "
PA—F. B. Kerr, " "
CE—E. W. Hess, " "
MS—John Boag ......Boardman, Pa.
SCO—Boardman Supply Co. Buyer, John Boag, Jr., Boardman, Pa.
S of H—Mules; track gauge 3 ft.
S of M—Hand.
EMP—225. Last fiscal year output 149,168 tons.

PRISCILLA COAL MINING CO.
General Office 922 Lafayette Bldg., Phila., Pa.
Priscilla Mine; Drift; "B" Seam, 40 to 44 in. thick.
PO—South Fork, Pa.; SP—Same; CTY—Cambria. RR—P. R. R.
PR—H. L. Merrick....Philadelphia, Pa.
TR—H. G. Merrick, " "
GM—S. J. Brown, " "

PA—John Reckman....South Fork, Pa.
MS—John Beckman, " "
EM—E. W. Hess, " "
S of H—Rope and mules.
S of M—Hand.
PP—Purchase power.
EMP—45. Last fiscal year output 37,500 tons.
Sales Agency, Geo. W. Bailey Co.

PROSPECT COAL & COKE CO

Solon Mine; Slope; Pgh. Seam; 90 to 108 in. thick.
PO—R. F. D. No. 4, Uniontown, Pa.; SP—Low Phos.; CTY—Fayette; RR—Monon. R. R. R.
PR—W. A. Stone, Uniontown, Pa.
GM—W. A. Stone, " "
GS—W. A. Stone, " "
TR—Geo. H. Bortz, " "
PA—Geo. H. Bortz, " "
MS—J. F. Dawson, R. D. No. 4, Uniontown, Pa.
CE—Fayette Eng. Co., Uniontown, Pa.
EM—Fayette Eng. Co., Uniontown, Pa.
MM—A. Holmes, R. F. D. 4, Uniontown, Pa.
SCO—Prospect Supply Co. Buyer, D. J. Walters, Uniontown, Pa.
S of H—Rope. Track gauge 44 ins.
S of M—Hand and 1 comp. air machine.
PP—1 Ames and 1 Erie return tubular boiler, total 200 H. P., one compressor, 3 pumps. Coke ovens—100 Bee Hive.
Last fiscal year output 23,122 tons.
Sales Agent, W. A. Stone & Co., Uniontown, Pa.

PROVIDENT COKE & MINING CO

Provident No. 1 Mine, Drift, Freeport Seam, 3½ to 5 ft. thick.
PO—Kelly Station, Pa. SP—Same. CTY—Armstrong; RR—P. R. R., A. V. Div.
PR—D. G. Bamford, Midway, Pa.
TR—H. J. Lindeman, Kittanning, Pa.
S of H—1 elec. loco., track gauge 42 in.
S of M—3 elec. mining machines.
PP—Buy power.

PRYOR COAL CO

General Office, Greensburg, Pa.
Avella No. 1, Drift, Pittsburgh Seam No. 6, 4 ft. 8 in. thick.
PO—Avella, Pa. SP—Same. CITY—Washington; RR—W. P. T. Ry.
PR—C. M. Jamison, Greensburg, Pa.
TR—John S. Sell, " "
GM—W. R. Turney, " "
PA—W. R. Turney, " "
CE—W. R. Turney, " "
MS—J. E. Ranft, Avella, Pa.
S of H—Mules and 2 elec. loco. track gauge 42 in.
S of M—6 Elec. chain machines.
PP—2 Erie City return tubular boilers, total 300 H.P., 250 volts, D.C.
EMP—130. Last fiscal year output, 130,000 tons. Sales Agents, Moreland Coke Co., Pittsburgh, Pa.

PUNXSUTAWNEY COAL MINING CO

General Office, 714 Marine National Bank Bldg., Buffalo, N. Y.
Frances Mine, Drift, Freeport Seam, 36 to 48 in. thick.
PO—Rossiter, Pa. SP—Frances, Pa.; CTY—Indiana; RR—B. R. & P.
PR—Harry Yates........Buffalo, N. Y.
TR—W. S. Blaisdell, Punxsutawney, Pa.
GM—W. S. Blaisdell, Punxsutawney, Pa.
PA—W. S. Blaisdell, Punxsutawney, Pa.
MS—C. J. Weber..........Rossiter, Pa.
CE—Chas. Means, " "
EM—Ned McCartney..Punxsutawney, Pa.
MM—M. E. Hanley.......Rossiter, Pa.
EE—S. Brent, " "
SCO—Frances Supply Co. Buyer, I. B. Williams, Punxsutawney, Pa.
S of H—4 elec. loco. Track gauge 42 in.
S of M—Hand, 20 Comp. air, and 3 Elec. mach.
PP—4 Water Tube Boilers, total 500 H. P., 200 K. W., 275 D. C., 1 air comp., 4 pumps.
EMP—150. Last fiscal year output 204,000 tons.

PURITAN COKE CO

General Office, Uniontown, Pa.
Puritan Mine, Slope, Pittsburgh **Seam**, 108 ins. thick.
PO—McClellandtown, Pa.; SP—Leckrone, Pa. CTY—Fayette. RR—P. R. R., Monongahela Div.
PR—James R. Gray......Uniontown, Pa.
TR—G. S. Horah, Uniontown, Pa.
GM—W. W. Parshall....Uniontown, Pa.
PA—F. R. Crow, McClellandtown, Pa.
MS—F. R. Crow, McClellandtown, Pa.
CE—South Penn. Eng. Co., Uniontown, Pa.
MM—John Wright, McClellandtown, Pa.
EE—John Wright, McClellandtown, Pa.
SCO—Puritan Supply Co. Buyer, Guy Worman, McClellandtown, Pa.
S of H—Mules and rope. Track gauge 42 in.
S of M—Hand.
PP—4 Titusville return tubular boilers, total 600 H. P. 2 pumps. Purchase power.
EMP—120. Coke ovens, 202 Bee Hive. Last fiscal year output 133,322 tons.
Sales Agent, W. W. Parshall and G. S. Horah, Uniontown, Pa.

QUEENSTOWN COAL CO.

Drift Mine; L. Kittanning Seam, 3 to 4 ft. thick.
PO—East Brady, Pa.; SP—Brady's Bend, Pa.; CTY—Armstrong; RR—W. A.
PR—J. C. Frazer, East Brady, Pa.
..**TR**—Wm. Frazer, " " "
GM—Wm. Frazer, " " "
PA—Wm. Frazer, " " "
S of H—Mules; track gauge 36 in
EMP—35. Last fiscal year output 29,526 tons.

PYRAMID COAL MINING COMPANY

General Office, Curwensville, Pa.
Pyramid No. 1 Mine; Drift; D Seam; 42 in. thick.
PO—Curwensville, Pa.; SP—Same; CTY—Clearfield; RR—N.. Y. C. & H. R.
PR—Fred Pilkington, Curwensville, Pa.
TR—I. B. Norris " "
GM—M. J. Kelly " "
PA—M. J. Kelly " "
MS—Fred Pilkington " "
EM—Geo. H. Ayres...Philipsburg, Pa.
S of H—Mules.
S of M—Hand.
PP—Power purchased.
EMP—95. Last fiscal year output, 70,000 tons. Sales Mgr., M. J. Kelly.

QUEMAHONING COAL CO.

General Office, Somerset, Pa.
PR—D. B. Zimmerman..Somerset, Pa.
GM—D. B. Zimmerman, " "
TR—R. S. Zimmerman, " "
GS—R. S. Zimmerman, " "
PA—H. H. Hodge, " "
CE—E. O. Long........Ralphton, Pa.
EE—J. L. Elliott, " "
SCO—A. W. Zimmerman & Co., buyer **A. W. Zimmerman, Ralphton, Pa.**

Ralphton Nos. 1 and 3; Slope and Drift; C Prime, 3½ to 4½ ft. thick.
PO—Ralphton, Pa.; SP—Boswell, Pa.; CTY—Somerset; RR—B. & O., Boswell Branch.
MS—E. O. Long........Ralphton, Pa.
S of H—7 Elec. loco.; track gauge 42 in.
S of M—1 Elec. mach.
PP—4 Water tube boilers, gen. unit D. C., 4 pumps.
EMP—243. Last fiscal year output 270,304 tons.

Zimmerman Nos. 4 and 5 Mines; Drift and Shaft; C Prime Seam, 3½ to 4 ft. thick.
PO—Ralphton, Pa.; SP — Same; CTY—Somerset; RR—B. & O., Boswell Branch.
MS—E. O. Long........Ralphton, Pa.
S of H—5 Elec. loco.; track gauge 42 in.
S of M—3 elec., 14 comp. air mach. and hand.
PP—2 Erie City water tube boilers, 1 gen. unit D. C., 1 comp., 4 pump.
EMP—326. Last fiscal year output 180,810 tons.

Zimmerman No. 6; Shaft; 3 to 4 ft.
PO—Somerset, Pa.; SP—Husband, Pa.; CTY—Somerset; RR—B. & O., Boswell Branch.
MS—J. F. Somerville, Somerset, Pa.
S of H—Mules; track gauge 42 in.
S of M—12 comp. air mach.
PP—4 Erie City return tubular boilers. 1 comp., 1 pump.
EMP—79. Last fiscal year output 50,724 tons.

Zimmerman No. 7 and 10 Mines; Drifts; 3 to 4 ft. thick.
PO—Ralphton, Pa.; SP — Same; CTY—Somerset; RR—B. & O., Boswell Branch.
MS—E. O. Long........Ralphton, Pa.
S of H—1 elec. loco. Track gauge 42 in.
S of M—1 elec. mach.
PP—Power from No. 5 Mine.
EMP—31. Last fiscal year output 13,782 tons.

QUEMAHONING CREEK COAL CO.

General Office, Somerset, Pa.
PR—J. C. Brydon.......Somerset, Pa.
TR—J. C. Brydon, " "
GM—J. C. Brydon, " "
GS—J. C. Brydon, " "
PA—E. N. Martin, " "
MS—S. C. Halverson, " "
EM—J. R. Blackburn, " "
SCO—Harrison Merc. Co. Buyer, H. W. Pugh, R. F. D., Somerset, Pa.

Quemahoning Creek No. 1 Mine; Drift, C Prime Seam 48 in. thick.
PO—R. F. D. Somerset, Pa; SP—Harrison; CTY—Somerset; RR—B. & O.; Quemahoning branch.
S of H—2 elec. locos. Track gauge 42 in.
S of M—1 elec. mach.
PP—2 Erie City water tube boilers, 1 gen. unit, 250 volts D. C., 3 pumps. Purchase power.
EMP—75. Last fiscal year output 70,135 tons.

Quemahoning Creek No. 2 Mine; Slope; C Prime Seam; 48 in. thick.
PO—Somerset, Pa.; SP—Harrison; CTY—Somerset; RR—B. & O., Quemahoning branch.
S of H—1 elec. loco.
S of M—1 elec. mach.
PP—1 Erie City water tube boiler, 2 pumps. Purchase power.
EMP—100. Last fiscal year output 19,846 tons.

RAINEY, W. J.

General Office, Uniontown, Pa.
GM—Scott Stewart, 527 Fifth Ave., **New York, N.Y.**
GS—L. L. Willard......Uniontown, Pa.
Asst GS—John Sincock, " "
PA—M. J. Farrell, " "
EE—E. P. Rauscher, " "
MM—Wm. Young, " "
Chief Eng—J. H. Dunn, " "
SM—J. W. Risdon, " "

Revere Mine; Slope; Conn. Seam.
PO—Uledi, Pa.; SP—Revere Works, Pa.; CTY—Fayette; RR—P. R. R.
MS—C. Patterson ....Uledi, Pa.
SM—J. M. Snyder, " "
S of M—10 Comp. air mach.
PP—8 boilers, total 1,200 H.P., 2 gen. units, 1 comp., 4 pumps, 550 coke ovens.

Allison Nos. 1 and 2 Mines; Shafts, Conn. Seam.
PO—Allison, Pa.; SP—Allison Works, Pa.; CTY—Fayette; RR—P.R.R., Monon. Div.
MS—Ben Holliday ....Allison, Pa.
SM—E. O. Smith, " "
S of M—4 Comp. air mach.
PP—5 Boilers total 1500 H. P., 2 gen. units, 1 comp., 1 pump., 300 coke ovens.

Grace; Slope; Conn. Seam.
PO—Connellsville, Pa.; SP—Moyer, Pa. CTY—Fayette; RR—P. R. R.
MS—E. B. Martin.....Connellsville, Pa.
SM—S. L. Wood, " "
PP—3 Boilers, total 350 H. P., 1 comp., 1 pump; Coke ovens, 124.

Elm Grove Mine; Slope. Conn. Seam.
PO—Dunbar, Pa.; SP—Elm Siding, Pa.; CTY—Fayette; RR—B. & O.
MS—Frank Chambers,......Dunbar, Pa.
SM—George B. Stillwagon, " "
PP—7 Boilers, total 1490 H.P., 3 comp., 2 pumps; coke ovens 200.

Acme Mine; Shaft.
PO—Mt. Pleasant, Pa.; SP—Acme Works, Pa.; CTY—Westmoreland; RR—P. R. R.
MS—Jno. Alexander, Mt. Pleasant, Pa.
SM—O. H. Roderick, " "
PP—3 Boilers, total 450 H. P., 2 gen. units, 2 comp., 2 pumps; coke ovens, 200.

Royal Mine; Shaft; Conn. Seam.
PO—Chestnut Ridge, Pa.; SP—Royal Works, Pa.; CTY—Fayette; RR—P. R. R.
MS—I. T. Mulle..Crestnut Ridge, Pa
SM—J. S. Smiley, " "
S of M—12 Comp. air mach.
PP—5 Boilers total 1560 H. P., 3 gen. units, 2 comp., 2 pumps, coke ovens 382.

Mount Braddock Mine; Slope; Conn. Seam.
PO—Mt. Braddock, Pa.; SP—Same and Gist, Pa.; CTY—Fayette; RR—B. & O., P. R. R.
MS—J. Harsham....Mt. Braddock, Pa.
SM—D. E. Foltz, " "
S of H—1 Steam loco.
PP—3 Boilers, total 1350 H. P., 3 gen. units, 4 comp., 4 pumps; coke ovens, 360.

Paul and Fort Hill Mines; Slope and Drift; Conn. Seam.
PO—Vanderbilt, Pa.; SP—(P) Dickerson Run, (FH) Dawson, Pa.; CTY—Fayette; RR—P. & L.E., B. & O.
MS—A. A. Mitchell.....Vanderbilt, Pa.
SM—S. G. McBurney. " "
PP—14 Boilers, total 11600 H. P., 1 gen. unit, 2 comp., 7 pumps, coke ovens, 395.

Union Mine. Abandoned.

RALSTON COAL CO

General Office, Ralston, Pa.
Red Run Mine; Drift; "B" Seam; 18 to 30 0in. thick.
PO—Ralston, Pa.; SP—Same; CTY—Lycoming; RR—P. R. R., N. C. Div.
PR—E. M. McCracken.....Ralston, Pa.
TR—J. J. Hollren......Ralston, Pa.
GM—H. W. Jones, " "
GS—R. E. Bachle, " "
PA—R. E. Bachle, " "
EM—R. E. Bachle, " "
MS—James Brownlee, " "
S of H—2 elec. loco. Track gauge 36 in.
S of M—Hand.
PP—2 Keeler and 2 Penna. water tube boilers, 2 gen. units, 250 volts, D. C.
EMP—50. Last fiscal year output 25,000 tons.

RAMEY COAL CO

Ramey Mine No. 1. Drift Mine, B. Seam, 52 to 56 in. thick.
PO—Ramey, Pa. SP—Same. CTY—Clearfield; RR—P. and S.
PR—F. F. Kramp, Ramey, Pa.
GM—F. F. Kramp, " "
GS—F. F. Kramp, " "
PA—F. F. Kramp, " "
TR—E. C. Davis, " "
S of H—Mules. Track gauge 36 ins.
S of M—Hand.
PP—1 pump. Purchase power.
EMP—60. Last fiscal year output 18,110 tons.

RAMSEY COAL CO., INC.

Ramsey Mine No. 1, Drift, Pgh. Connellsville Seam, 6 to 8 ft. thick.
PO—Ligonier, Pa.; SP—Same; CTY—Westmoreland; RR—Ligonier Valley.
PR—E. C. Ramsey, Ligonier, Pa.
TR—H. S. Lohr, " "
GM—S. S. Brownfield, " "
PA—S. S. Brownfield, " "
GS—S. S. Brownfield " "
TR—H. D. Lohr, " "
MS—Geo. E. Alexander, Wilpen, Pa.
EM—S. S. Brownfield, Ligonier, Pa.
S of H—Mules. Track gauge 42 in.
S of M—Hand.
PP—1 Gasoline Engine driving fan.
EMP—45. Last fiscal year output 43,427 gross tons.

Ramsey Mine No. 2, Drift, Pittsburgh Connellsville Seam; 6 to 8 ft. thick.
PO—Ligonier, Pa.; SP—Same; CTY—Westmoreland; RR—Ligonier Valley.
S of H—Mules. Track gauge 42 ins.
S of M—Hand.
Note—Just commencing operations.

RANDOLPH COAL CO.

General Office, Meyersdale, Pa.
Randolph Mine, drift, C Prime Seam 40 to 48 in thick.
PO—Hooversville, Pa. SP—Boswell, Pa. CTY—Somerset. RR—B. & O. Quemahoning Br.
PR—R. E. Beerits........Somerset, Pa.
TR—A. G. Smith.......Meyersdale, Pa.
GM—A. G. Smith, " "
PA—A. G. Smith, " "
MS—Geo. Waddell, Hooversville, Pa.
EM—J. J. Hoblitzell, Jr., Meyersdale, Pa.
MM—J. Bridget.......Hooversville, Pa.
EE—J. Bridget, " "
SCO—Edgar Stotler, Hooversville, Pa.
S of H—1 elec. loco. and mules. Track gauge 36 in.
S of M—Hand.
PP—Buy power. 1 gen. unit, 250 volts D. C., 2 pumps.
EMP—140. Last fiscal year output, 87,690 tons.

RARIDAN & EAST BRADY COAL CO.

Raridan Mine, Drift; Freeport Seam; 40 to 42 in. thick.
PO—Logansport, Pa.; SP—Glenn, Pa.; CTY—Armstrong; RR—P. R. R., B. A. V. Div.
PR—J. C. Gray, Frick Bldg., Pgh., Pa.
TR—J. H. Thompson, " " "
GM—J. H. Thompson, " " "
GS—J. H. Thompson, " " "
PA—J. H. Thompson, " " "
CE—Albert Smith......Saltsburg, Pa.
EM—Albert Smith, " "
MS—H. J. Christy......Logansport, Pa.
S of H—1 Elec. loco.; track gauge 40 in.
S of M—2 Elec. mach.
PP—2 Return tubular boilers, gen. units 250 volts, 1 compressor, 1 pump.
EMP—50. Last fiscal year output 52,000 tons.

READING IRON CO

General Office, Reading, Pa.
Reading Mines Nos. 3 and 4; Drifts, No. 3 C, No. 4 E Seams, 36 to 42 in. thick.
PO—Kimmelton, Pa.; SP—Stoyestown, Pa. CTY—Somerset. RR—B. & O. S. & C. Br.
PR—F. C. Smink.........Reading, Pa.
TR—H. N. Yost, " "
GM—Geo. Schuhmann. " "

(Continued on Next Page.)

Reading Iron Co.—Cont.
GS—Geo. J. Krebs, Kimmelton, Pa.
PA—Geo. J. Krebs, " "
EM—Geo. Hunt, " "
MM—Ivan Gillespie, " "
S of H—5 Elec. loco., track gauge 36 in.
S of M—21 elec. mach.
PP—2 B & W Water tube boilers, total 800 H.P., 2 gen. units 250 volts D.C, 1 compressor and 2 pumps.
EMP—200. Last fiscal year output, 152,783 tons. Sales Agent, G. F. D. Hallman, Reading, Pa.

REAM, J. O.
Ream Nos. 1 and 2 Mines. Drift, Price Seam. 24 to 48 in. thick.
PO Berlin, Pa SP—Same. CTY—Somerset. RR—B & O., Berlin Br.
GM—John O. Ream........Berlin, Pa.
GS—John Ream, " "
MS Stuart Pritz, " "
S of H—Mules.
S of M—Hand.
PP 1 Pump; power purchased.
EMP—24 Last fiscal year output 21.146 tons.
Successors to the Grace Coal Co.

RED TOP COAL CO
No. 1 Mine, Drift Mine, "B" or Miller Vein Seam 34 to 36 in. thick.
PO—Hastings, Pa. SP Same. CTY Cambria. RR—P.R.R., C. & C. Div.
PR—Chas. Hetrick, Hastings, Pa.
TR—Chas. Hetrick, " "
GM—Chas. Hetrick, " "
PA—Chas. Hetrick, " "
MS - Geo. Commons, " "
EM—Chas E. Schlicker, Spangler, Pa.
SCO—Jas. Commons & Sons. Buyer,—Guy Common, Hastings, Pa.
S of H—Mules; Track gauge 36 in.
S of M—Hand.
EMP—36. Last fiscal year output 25,000 tons. Sales Agent, Chas. Hetrick, Hastings, Pa.

REED COLLIERY CO.
General Office, Dudley, Pa.
GM—W. H. Reed, Dudley, Pa.
GS—W. H. Reed, " "
PA—W. H. Reed, " "
SCO—C. D. Reed, " "
Sales Agent, W. H. Reed, " "

Benedict No. 1 Mine, slope and drift, Barnett & Fulton Seam, 5 ft. thick.
PO—Dudley, Pa. SP—Same. CTY—Huntingdon. RR—H. & B. T.
..**S of H**—Mules.
S of M—Hand.
PP—2 Return tubular boilers, total 200 H.P., 1 gen. unit, 250 volts D.C..
EMP—37. Last fiscal year output, 20,000.

Reed No. 2 Mine, slope, Moshannon Seam, 3 ft. thick.
PO—Berwinsdale, Pa. SP—Same. CTY—Cleafield. RR—P.R.R.
S of H—Mules and rope.
S of M—2 Elec. mach.
PP—1 gen. unit 250 volts D.C., 1 Pump. Power purchased.
EMP—47. Last fiscal year output 37,000 tons.

REILLY, JOS. H. COAL COMPANY
Reilly Colliery No 1 Mine; Shaft; "B" Seam; 40 to 48 in. thick
PO—Spangler, Pa.; SP—Same; CTY—Cambria; RR -Penna., C. & C. br.
PR Jos. H. Reilly...Philadelphia, Pa.
GM—Jos. H. Reilly, " "
TR - John E. Reilly......Spangler, Pa.
GS—John E. Reilly, " "
PA —John E. Reilly, " "
MS—Wm. H. Young, " "
EE—D. T. Brady, " "
SM—C. R. Jones, " "
SCO C. R. Jones & Co.
S of H 1 elec. loco.
S of M—Hand.
PP Purchase power
EMP—18. Still in developing stage. Shipped 2,000 tons from 3-6-16 to 5-10-16

REILLY & CALLAGHAN COAL & COKE CO.
GM W. J. Reilly, R. D. No 2, Smithfield, Pa.
GS —M. W. Callaghan, R. D. No 2, Smithfield, Pa.
No report.

REITZ COAL CO.
Windber, Pa. No report.

RELIANCE COKE CO.
General Office. Pittsburgh. Pa.
Denbo Mine; Shaft; Pittsburgh Seam, 72 to 100 in. thick.
PO—Denbo, Pa.; SP—Same; CTY—Washington; RR—P. R. R., Monon. Div.
PR—H. C. Fownes......Pittsburgh, Pa.
TR—Wm. C. Fownes, Jr., " "
PA —W. E. Motheral, " "
GS—F. Hoving............Denbo, Pa.
EM—E. M. Reed...........Denbo, Pa.
MM—Chas. Ball, " "
SCO—Denbo Supply Co., Buyer, H. B. Sinsley, Denbo, Pa.
S of H Mules and 2 Elec. loco.; track gauge 44 in.
S of M 7 Elec. mach.
PP—3 Rust Return tubular boilers, total 1000 H. P., 2 gen. units 275 volts D. C., 1 pump.

EMP—200. Coke ovens, 236 Rectangular. Last fiscal year output 160,000 tons.
Sales Agent, O. W. Mason, Pittsburgh, Pa.

REPUBLIC IRON & STEEL CO.
General Office, Youngstown, O.
PR—T. J. Bray......Youngstown, O.
PR—Asst—J. E. Perry, " "
TR—H. L. Rownd, " "
PA—C. I. Starrett, " "
GS—George H. Morse....Republic, Pa.
EM—F. M. Newhall, " "
SCO—Crescent Supply Co., Buyer H. H. King, Republic, Pa.

Republic Mine; Shaft; Pgh. Seam.
PO—Republic, Pa.; SP—Same; CTY—Fayette; RR—P. R. R. Monon. Div.
MS—A. R. Miller.......Republic, Pa.
S of H—8 Comp. air loco. and mules.
S of M—16 Comp. air mach.
PP—5 Water tube boilers, 2 gen. units, 250 D. C., 4 comp. and 1 pump. 400 Bee Hive coke ovens.

Martin Mine; Drift; Pgh. Seam.
PO—Martin, Pa.; SP—Same; CTY—Fayette; RR—P. R. R., Monon Div.
MS—B. R. Lindsay........Martin, Pa.
S of H —4 elec. loco. and mules.
S of M 4 elec. mach and hand.
PP—3 Water tube boilers, 2 gen. units 250 volts D. C., 1 pump; 244 Bee Hive coke ovens.

Bowood Mine Drift; Pgh. Seam.
PO—Smithfield, Pa.; SP—Bowood, Pa.; CTY—Fayette; RR—B. & O.
MS John Laick. ....Smithfield, Pa.
S of H—Mules and 1 elec. loco.
S of M Hand and 2 elec. mach.
PR—1 M. G. set. 250 volts D. C., 2 pumps. Purchase power.

Acheson Mine; Drift; Pgh. Seam.
PO—Gans, Pa.; SP—Acheson, Pa.; CTY—Fayette; RR—B. & O.
MS- Frank Decker..........Gans, Pa.
S of H 1 elec. loco. and mules.
S of M—Hand.
PP—1 M. G. set, 250 volts D. C., 2 pumps. Power purchased.

RICE COAL & COKE CO.
General Office, Connellsville, Pa.
PR W. P. Stillwagon, Connellsville, Pa.
GM W. P. Stillwagon " "
GS W. P. Stillwagon, " "
TR—W. E. Rice, " "
PA W. E. Rice, " "
EM -S. M. Foust, " "
Sales Agent, W. E. Rice, " "

Rice No. 1 Mine. Abandoned.
Rice No. 2 Mine; Drift; Pittsburgh Seam, 72 to 90 in. thick.
PO—Oucrop, Pa.; SP—Same; CTY—Fayette; RR B. & O.
MS Jess Jones...........Outcrop, Pa.
S of H —Mules. Track gauge 36 in.
S of M —Hand.
EMP—21.

Rice No. 3 Mine; Drift; Connellsville Seam; 108 to 120 in. thick.
PO Fairchance, Pa.; SP York Run, Pa.; CTY —Fayette; RR B. & O.
S of H—Mules.
S of M Hand.
EMP 23.

RICES LANDING COAL & COKE CO.
Rices Landing Mine, Shaft, Pgh. Seam 7 ft. 4 in.
PO—Rices Landing, Pa.; SP—Same CTY—Greene; RR—P.V.& C.R.R.
PR—Robert S. George....Pgh., Pa.
PA—Robert S. George, " "
GM—Jas. R. Black, Rices Landing, Pa.
GS—Jas. R. Black, " "
EM—Wm. Gondy, " "
MM—Wm. Fuller "
EE—Robt. Black, " "
SCO -McElhose Supply Co., Buyer, Mr. McCleary.
S of H—3 elec. loco. and mules; track gauge 44 in.
S of M—6 elec. mach. and hand.
PP—Water tube boilers, total 600 H. P., 2 gen. units, 250 volts, D. C., 1 air comp., 4 pumps.
Sales agent, Robt. S. George, Farmers Bank Bldg., Pittsburgh, Pa.

RICH HILL COAL CO.
General Office, Hastings, Pa.
Rich Hill No. 1 and 2 Mines; Drift; E Seam, 36 to 50 in. thick.
PO—Hastings, Pa.; SP—Same; CTY—Cambria; RR—P. R. R.; Hastings Branch.
PR—J. L. Kemmerer, Philadelphia, Pa.
TR—C. H. Jacobs, " "
GM—Jas. H. Allport...Hastings, Pa.
PA—W. H. Allport, " "
MS—W. H. Allport , " "
EM—Chas. E. Schlicher, Spangler, Pa.
EE—M. M. Stevens ....Hastings, Pa.
S of H—7 elec. loco. Track gauge 36 in.
S of H Hand and 10 Elec. mach.
PP -Power purchased.
EMP—500. Last fiscal year output 362,780 tons.

RICH HILL COKE CO.
General Office, Uniontown, Pa.
Rich Hill Mine; Slope, Connellsville Seam. 72 to 84 in. thick.
PO —Out Crop, Pa.; SP —Smithfield, Pa. CTY—Fayette; RR -B. & O., Fairmont Div.
PR—A. L. Moser......Uniontown, Pa.
TR—Wm. M. Thompson, " "
GM D. S. Richey, " "
GS —D. S. Richey, " "
PA- -D. S. Richey, " "
EM H. B. Gans, " "
MM—Mike Louish......Out Crop, Pa.
SCO—Out Crop Supply Co., Out Crop, Pa.
S of H -1 Elec loco.
S of M—Hand.

PP —2 Return tubular boilers, 2 gen. units each 125 volts D. C.
EMP—60; Coke ovens, 120 Bee Hive.
Sales Agency, J. H. Hillman & Sons, Pittsburgh, Pa.

RINN, S. A. & CO.
General Office, Punxsutawney, Pa.
Frostburg Mine; Drift; L. Freeport Seam 5 ft. thick.
PO—Frostburg, Pa.; SP—Same; CTY—Jefferson; RR—B. R. & P.
PR—S. A. Rinn....Punxsutawney, Pa.
GM—S. A. Rinn, " "
TR E. H. Winslow, " "
PA -E. H. Winslow, " "
GS —W. N. Trussell, " "
CE—H. M. Kanarr, " "
MM—E. C. Jenkin ......Dayton, Pa.
MS—John Cummings....Frostburg, Pa.
S of H—1 elec. loco. Track gauge 42 in.
S of M —2 elec. mach.
PP—4 Water tube boilers, total 600 H. P., 2 gen. units 500 volts D. C., 1 comp. and 4 pumps.
EMP—300. Last fiscal year output 250,000 tons.

RIVERSIDE COAL MINING CO.
Riverside No. 1 Mine, Drift, "E" and "C" Seam, 3 ft. thick
PO—South Fork, Pa.; SP—Same; CTY—Cambria. RR—P.R.R.
PR—Chas. H. Cutter..Boston, Mass.
TR—B. C. Leonard..South Fork, Pa.
GM—B. C. Leonard, "
GS—B. C. Leonard, " "
PA -B. G. Leonard, " "
S of H —Elec. loco.; track gauge 36 in.
S of M—Hand.
Sales Agent, Gorman-Leonard Coal Co., Worcester, Mass.

ROARING RUN MINING COMPANY.
General Office, Blairsville, Pa.
Roaring Run Mine, Drift; "E" or Up. Freeport Seam; 3 to 5 ft. thick.
PO—Apollo, Pa.; SP—Roaring Run, Pa.; CTY—Armstrong; RR—P.R.R., Conemaugh Div.
PR—W. P. Graff......Blairsville, Pa.
GM—F. M. Graff, " "
PA—F. M. Graff, " "
MS—Ernest Fletcher ...Saltsburg, Pa.
SM —H. H. Murray.........Apollo, Pa.
CE—Albert Smith......Saltsburg, Pa.
EM—Albert Smith, " "
MM—Chancey Shipley, " "
EE—H. A. Scott, " "
SCO—Kiskiminetas Supply Co., Roaring Run Store, Buyer, Wm. G. Fletcher, Blairsville, Pa.
S of H—4 Elec. loco., track gauge 42 in.
S of M—9 Elec. mach.
PP—2 Erie City return tubular boilers, total 300 H. P., 1 gen. unit, 250 volts.
EMP -240. Last fiscal year output 201,753 tons.
Sales Agent, Knickerbocker Fuel Co., New York, N. Y.

ROCHESTER & PITTSBURGH COAL & IRON CO.
General Office, Punxsutawney, Pa.
PR—L. W. Robinson.Punxsutawney, Pa.
TR—George H. Clune..Rochester, N.Y.
GM—F. M. Fritchman..Indiana, Pa.
EM—M. L. Coulter, Punxsutawney, Pa. George W. Brymer, Indiana, Pa.
PA—H. C. Smith..Punxsutawney, Pa.
DIV. SUPT—I. J. Harvey, Helvetia, Pa.
Asst GM—Frank Pardoe, Punxsutawney, Pa.
EE—L. W. Householder Punxsutawney, Pa.
SCO—Mahoning Supply Co., Mgr.D .H. McIntyre, Punxsutawney, Pa.
Sales Mgr., Geo. L. Eaton, Rochester, N. Y.

Adrian and Florence Mines; Slope.
PO—Delancey, Pa.; SP—Same; CTY—Jefferson; RR—B. R. & P.
MS —George Morris........Delancey, Pa.
S of H—26 Elec. and 3 steam loco.
S of M—69 Comp. air mach.
PP—38 Return tubular boilers, total 3,700 H. P., 10 comp. and 8 pumps.
EMP—1,017.

Walston Mine; Slope.
PO—Walston, Pa.; SP—Same; CTY—Jefferson; RR—B. R. & P.
MS—W. M. Scott......Walston, Pa.
S of H—1 Elec. and 2 steam loco.
S of M—12 Comp. air mach.
PP—12 Return tubular boilers, total 1120 H. P. and 2 comp.
EMP—314.

Eleanora Mines; Shaft; Drift and Slope.
PO—Elenora, Pa. SP—Elenora, Pa. CTY—Jefferson; RR—B.R.& P.
MS—John L. White ......Eleanor, Pa
S of H—14 Elec. and 2 steam loco.
S of M—56 Elec. mach.
PP—24 Return tubular boilers, total 3480 H. P., 7 comp. and 5 pumps.
EMP—657.
Helvetia Mine, Shaft.
PO—Helvetia, Pa. SP—Stanley, Pa. CTY—Jefferson; RR—B. R. & P.
MS -I. J. Harvey.....Helvetia, Pa.
S of H—7 Elec. loco.
S of M—27 Comp. air mach.
PP—14 Return tubular boilers; total 1,820 H. P., 4 comp. and 3 pumps.
EMP—462.
Cowan Mine; Drift.
PO—Cowansville, Pa.; SP—Cowan, Pa.; CTY—Jefferson; RR—B. R. & P.
MS I. J. Harvey....Helvetia, Pa.
S of H—Elec. loco. and rope.
S of M—4 comp. air mach.
PP—2 Return tubular boilers, total 300 H. P., 2 comp. and 1 pump.
EMP—86.
Lucerne Mine.
PO—Lucerne, Pa.; SP—Same; CTY—Indiana. RR—B. R. & P.
MS -C. W. Stuart.........Lucerne, Pa.

ROCK RUN COAL CO.
General Office, Williamsport, Pa.
Rock Run Coal Co. Mine.
PR—A. R. Spiecer...Williamsport, Pa.
TR C. H. McCauley, Jr., " "
GS—D. T. Jenkins.....Blossburg, Pa.
PA -Scott Jenkins " "
CE—S. J. Hayt, Jr....Williamsport, Pa.

RUCKHILL IRON & COAL CO. (THE)
General Office, Philadelphia, Pa.
PR—G. Theo. Roberts, New York, N.Y.
TR—S. J. Livingston....Phila., Pa.
GM—J.S. Sommerville, Robertsdale, Pa
PA—J. K. Morrison, " "
EM—J. F. Neilan, " "
EE—R. H. Felton......Robertsdale, Pa.
MM S. A. Minnick.........Wood, Pa.
Sales Agent, S. J. Livingston, Phila, Pa.

No. 1 Mine; Drift; Fulton Seam, 54 in. thick.
PO Robertsdale, Pa.; SP—Same; CTY—Huntingdon RR—E. B. T.
MS C. M. Fick.......Robertsdale, Pa.
S of H -Tail rope and mules.
S of M—Hand.
PP—Steam from Robertsville Mine; Electricity from Woodvale Mine.
EMP —125. Last fiscal year output 64,333 tons.

Robertsdale Mine, Slope, Fulton seam, 4 1-2 ft. thick.
PO—Robertsdale, Pa., SP—Same, CTY Huntingdon, RR — East Broad Top RR.
MS—W. J. Young, Robertsdale, Pa.
S of H—Mules, tail rope and elec. hoists. track gauge 36 in.
S of M—Hand.
PP —3 Erie and 1 Keeler Return tubular boilers, total 480 H. P., 4 pumps.
EMP —375. Last fiscal year output 234,140 tons.

Woodvale Mine, Shaft, Fulton Seam, 4 1-2 ft. thick.
PO—Robertsdale, Pa.; SP—Same, CTY—Huntingdon. RR—East Broad Top RR.
MS -E. A. Hawley..........Wood, Pa.
S of H—Mules, tail rope and air hoists. Track gauge, 36 in.
S of M—Hand.
PP—4 Water tube B. & W. boilers, total 940 H. P., 1 gen. unit 2300 volts A. C., 3 phase, 60 cycles, 1 air compressor, and 4 pumps.
EMP—300. Last fiscal year output 176,554 tons.

No. 7 Mine; Slope; Fulton Seam, 52 in. thick.
PO—Robertsdale; SP—Same; CTY—Huntingdon; RR—E. Broadtop.
MS—Walter Williams...Robertsdale, Pa.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—Power from Woodvale Mine.
EMP—80. Began shipping coal 12-27-15.

ROCKY RIDGE COAL CO.
General Office, E. Pittsburgh, Pa.
Wrays Hill Mine, Slope, Fulton Seam, 48 to 168 in. thick.
PO—Robertsdale, Pa.; SP—Rocky Ridge Station, Pa.; CTY—Huntingdon; RR—H & B. T.
PR—W. A. Thomas..E. Pittsburgh, Pa.
TR—F. C. Lane, " "
GS—J. Ross Griffith....Broad Top, Pa.
EM—J. M. Afrien....Huntingdon, Pa.
S of H—1 Steam loco., mules and rope; track gauge 36 in.
S of M—Hand.
PP—1 Nagle water tube boilers, 35 H. P.; 2 pumps.
EMP—45 Last fiscal year output 37,000 tons.

ROGERS COAL CO.
General Office, Scottdale, Pa.
Rogers Mine; Drift; Seam 60 in. thick.
PO—Rogers Mills, Pa.; SP—Same; CTY Fayette; RR—B. & O., Indian Creek Valley Br.
PR—J. W. Newbrough, Scottdale, Pa.
TR—M. E. Reid, " "
MS—William Helsing......Dunbar, Pa.
S of H—Gravity.
EMP— 16. Last fiscal year output 9,632 tons.

ROMESBURG COAL COMPANY.
Hocking Mine; Drift; C Prime Seam; 46 to 48 in. thick.
PO—Garrett, Pa; SP—Same; CTY—Somerset; RR— B. & O.
PR—M. J. Romesburg, Blackfield, Pa.
EE—H. C. Conley, Blackfield, Pa.
GS—Harry Philips, Pine Hill, Pa.
TR—N. Romesberg, Garrett, Pa.
SCO—Romesberg Supply Co.
S of H—Mules Track gauge, 36 in.
S of M—Hand.

ROSS RUN COAL CO.
No. 1 and 2 Mines, Drift, L. Freeport Seam, 3 ft. 6 in. to 5 ft. thick.
PO—Punxsutawney, Pa.; SP—Fordham, Pa.; CTY—Jefferson; RR—P.R.R. Bellwood Branch.
MS—B.D. Hampson, Punxsutawney, Pa.
EM—B. D. Hampson, Punxsutawney, Pa.
S of H—Mules, track gauge 36 in.
S of M—Hand.

ROWE, C. J. & BROS.
Hamilton and Mystic Mines, Drift, Redstone Seam 3 1-2 to 5 ft. thick.
PO—Meyersdale, Pa.; SP—West Salisbury, Pa.; CTY—Somerset; RR—B. & O., Salisbury Branch.
PR—C. J. Rowe......Meyersdale, Pa.
GS—C. J. Rowe, " "
PA—C. J. Rowe, " "
TR—Fred E. Rowe, " "
CM—Fred E. Rowe, " "
SCO—The Rowe Mercantile Co., Buyer Fred E. Rowe, Meyersdale, Pa.
S of H—Mules, rope and elec. loco. Track gauge 42 in.
S of M—Hand.
PP—Buy power.
EMP—127. Last fiscal year output 67,500 tons.

ROYAL COAL COMPANY.
Slope Mine; B Seam; 40 in. thick.
PO—Winburne, Pa. SP—Munson, Pa. CTY—Clearfield. RR—New York Central, Royal Branch.
PR—Rembrandt Peale, New York, N. Y.
TR—Thos. J. Fitzpatrick, New York, N.Y.
GM—J. P. Cameron, Pitsburgh, Pa.
GS—R. H. George, Winburne, Pa.
PA—G. E. Metzger, St. Benedict, Pa.
MS—Richard Adams, Allport, Pa.
EM—Womelsdorf & Dinkel, Philipsburg, Pa.
SCO—Winburne Trading Co.
S of H—Mules and rope. Track gauge 36 in.
S of M—2 elec. machines.
PP—Motor gen. set, 250 volts D. C., 2200 A. C., 3 phase, 60 cycle, 1 pump. Purchase power.
EMP—30 Daily output 100 tons.

RUMMEL COAL MINING CO.
Out of business.

RUSSELL COAL CO.
Victor Nos. 24, 25, 26, 27, and 29 Mines; Drifts and Slopes; "B" & "D" Seams; 3½ ft. thick.
PO—Clymer, Pa.; SP—Same; CTY—Indiana; RR—N. Y. C.
PR—Rembrandt Peale, St. Benedict, Pa.
VP—Richard Peale, " "
TR—W. B. Oakes, " "
CE—Merritt Hutton, " "
EM—Merritt Hutton, " "
MM—E. Kent Davis, " "
EE—E. Kent Davis, " "
PA—G. E. Metzger..St. Benedict, Pa.
MS—W. D. Dunsmore....Clymer, Pa.
SM—E. H. Harvey, " "
S of H—Rope, mules and 8 elec. loco., track gauge 3 ft.
S of M—Hand, 8 Elec. and 60 comp. air mach.
PP—8 Ames water tube boilers total 1800 H. P., 3 gen. units, 550 volts; 4 air comp.; 7 pumps.
EMP—750.

RUSSETT COAL CO.
General Office, Mineral Point, Pa.
Russett Mine; Drift. "B" Seam, 48 in. thick.
PO—Coupon, Pa.; SP—Kittanning Point, Pa.; CTY—Cambridge; RR—P. R. R.; Kittanning Run Br.
PR—W. S. Lee..........Altoona, Pa.
TR—James A. Page..Mineral Point, Pa.
GM—James A. Page, " "
PA—James A. Page, " "
MS—James A. Page, " "
CE—D. W. Dillman.......Altoona, Pa.
S of H—Mules.
S of M—Hand.
EMP—27. Last fiscal year output 20,817.45 tons.
Sales Agent, C. B. Loudon, Altoona, Pa; Successors to Loudon & Page.

SACKETT, H. R. COAL & COKE CO.
Sackett Mines; Slope; Pgh. Seam.
PO—Smithfield, Pa.; SP—Same; CTY—Fayette; RR—B. & O.
GM—H. R. Sackett, ..Smithfield, Pa.
PA—H. R. Sackett, " "
MS—Austin Anderson, " "
SCO—Crystal Supply Co., " "
S of H—Mules.
S of M—Hand.
PP—Boiler 50 H. P.
EMP—40. Coke ovens, 30. Last fiscal year output 5,200 tons.

ST. CLAIR COAL CO.
See Seeger Bros.

SALTSBURG COAL MINING CO.
Foster Nos. 1, 2 and 3 Mines, Drift.
PO—Edri, Pa.; SP—Same; CTY—Indiana; RR—P. R. R.
GM—L. W. Hicks.....Leechburg, Pa.
PA—L. W. Hicks, " "
MS—Thos. Adams............Edri, Pa.
EM—E. A. Watters, " "
S of H—3 Elec. locos.
S of M—Elec. machines.
PP—5 Return tubular boilers, total 750 H. P., 1 gen. units, 250 volts D. C., 4 pumps.
EMP—364. Last fiscal year output 470,481 tons.

SANFORD, J. H., COAL CO.
General Office, Park Bldg., Pittsburgh, Pa.
Armide Mine; Drift; Pgh. Seam, 4½ to 6 ft. thick.
PO—Joffre, Pa.; SP—Raccoon, Pa.; CTY Washington; RR—P. R. R., Cherry Valley Branch.
PR—J. H. Sanford....Pittsburgh, Pa.
TR—R. B. Haverstock, " "
GS—G. F. Osler, " "
PA—R. B. Haverstick, " "
MS—Chas. King...........Joffre, Pa.
EM—J. W. Adams......Oakdale, Pa.
SCO—Raccoon Supply Co. Buyer, Jos. Dumon, Joffre, Pa.
S of H—9 Elec. loco., track gauge 42 in.
S of M—Hand and 15 elec. mach.
PP—3 Oil City water tube boilers, total 700 H. P., 2 gen. units, 500 volts D. C.
EMP—350. Last fiscal year output 314,677 tons Sales Mgr., M. M. Griest, Pittsburgh, Pa.

SAVAGE FIRE BRICK COMPANY
General Office, Meyersdale, Pa.
Glade City Mine; Drift.
PO—Meyersdale, Pa.; SP—Same; CTY—Somerset; RR—B. & O.
PR—Percy Allen Rose...Johnstown, Pa.
GM—S. J. McClune,...Meyersdale, Pa.
PA—S. J. McClune, " "
MS—Samuel Bowman, " "
S of H—Mules and 1 steam loco.
Sales Agent, S. J. McClune, Meyersdale, Pa
Note—Use output in brick plant.

SAVAN COAL CO
See Savan Colliery Co.

SAVAN COLLIERY COMPANY.
Savan No. 1 Mine; Drift; E Seam; 30 to 36 in. thick.
PO—Rochester Mills, Pa; SP—Savan; CTY—Indiana; RR—B. R. & P.
PR—Vernon F. Taylor, Rochester Mills,, Pa.
GM—Vernon F. Taylor, Rochester Mills,, Pa.
PA—Vernon F. Taylor, Rochester Mills,, Pa.
MS—James Montieth, Rochester Mills,, Pa.
SM—G. O. Richardson, Rochester Mills,, Pa
S of M—Hand.
EMP—50.
Note—Successors to Savan Coal Co.

SCALP LEVEL COAL MINING CO.
General Office, Windber, Pa.
Scalp Level Mine; Drift.
PO—Windber, Pa.; SP—Same; CTY—Somerset; RR—P. R. R.
PR—John Lochrie.......Windber, Pa.
PA—Geo. Tyler, " "
S of H—Elec. loco.
S of M—Elec. mach.
PP—250 volts D. C. Power purchased.

SCHIPPER BROTHERS COAL CO.
General Office, Boston, Mass.
PR—Fred G. Schipper..Boston, Mass.
TR—C. F. Schipper, " "
GM—C. F. Schipper, " "
PA—C. F. Schipper, " "
GS—John Schipper, Six Mile Run, Pa.
SCO—Barnett Supply Co., Buyer, B. E. Cutchall, Six Mile Run, Pa. Sales agent, C. F. Schipper, Boston, Mass.

Ladysmith Nos. 1, 2, 3 and 4, Drift and Slope, Fulton and Kelly Seam 4 ft. thick; Fulton Seam 5 1-2 ft. thick.
PO—Six Mile Run, Pa., SP—Coaldale, Pa., CTY—Bedford. RR—H. & B. T.
MS—Frank Grimes, Six Mile Run, Pa.
S of H—Mules and gravity; track gauge 38 in.
S of M—Hand.
PP—1 Erie boiler, 80 H. P.
EMP—100.

Cresent No. 7, Bartle No. 2 and Cuba Nos. 1 and 2; Drifts; Barnett Seam, 3 ft. thick.
PO—Six Mile Run, Pa., SP—Coaldale, Pa., CTY—Bedford; RR—H.& B.T.
MS—John Garrity, Six Mile Run, Pa.
S of H—Mules and gravity; track gauge 38 in.
S of M—Hand.
EMP—50.

SCOOTAC MINING CO.
General Office, Williamsport, Pa.
Scootac Mine, Drift, Seam 48 to 58 in.
PO—Lock Haven, Pa.; SP— North Fork, Pa.; CTY—Clinton. RR—P. R. R., Tangus Branch.
PR—C. La Rue Munson, Williamsport, Pa.
PA—W. R. Kramer, " "
TR—C. G. Buck...Williamsport, Pa.
MS—W. H. Ellis......Lock Haven, Pa.
S of H—Mules and rope. Track gauge 36 in.
S of M—Hand.
PP—2 water tube boilers, total 125 H. P., 3 pumps.
EMP—75. Last fiscal year output 40,908 tons.

SCOTT COAL MINING CO.
Mascot No. 1 Mine; Slope, "B" Seam, 48 in. thick.
PO—Philipsburg, Pa.; SP—Houtzdale, Pa.; CTY— Centre; RR—P. R. R
GM—George Scott, Sr..Philipsburg, Pa.
TR—H. B. Scott, " "
GM—H. B. Scott, " "
PA—H. B. Scott, " "
MS—D. R. Williams....Houtzdale, Pa.
S of H—2 Elec. loco.; track gauge 42 in.
S of M—2 Elec. mach.
PP—1 150 K. W., M. G. Sett, 3 phase. Power purchased.
EMP—100.
Sales Agents, H. B. Scott & Co., Philipsburg, Pa.

SCOTT, H. B. & CO.
General Office, Philipsburg, Pa.
Colorado No. 5 Mine; Drift.
PO—Munson Station, Pa.; SP—Same; CTY—Clearfield; RR—N. Y. C. & H.
GM—H. B. Scott....Philipsburg, Pa.
PA—H. B. Scott, " "
S of H—Elec. loco.,
S of M—Elec. mach.
PP—3 Boilers, total 450 H. P., gen. units 500 volts D. C.

SEESE & MANGES COAL CO.
See Egolf Coal Mining Co.

SEGER BROS.
PR—Samuel Seger......Ligonier, Pa.
TR—John Seger, " "
PA—John Seger, " "
GM—Samuel Seger, " "
GS—Samuel Seger, " "
CE—W. H. Matthews, " "
EM—Robert McInnes, " "
SCO—Wilpen Supply Co., Buyer, L L. Tosh, Ligonier, Pa.
Sales Agent, H. L. Bracken.

Ligonier Diamond Nos. 1 and 2 Mines; Drift; Pittsburgh, Connellsville Steam Coal, 7 ft. thick.
PO—Ligonier, Pa., SP—Wilpen Pa. CTY—Westmoreland. RR—Ligonier Valley.
MS—(1) Robert McInnes, Ligonier, Pa.
MS—(2) R. B. McDowell, " "
MM—(1) Walter Echard, " "
MM—(2) John Barron, " "
S of H—Mules and 2 gasoline motors, track gauge, standard.
S of M—Hand.
PP—Boiler, 100 H. P., 1 pump.
EMP—218. Last fiscal year output 364,136 tons.

St. Clair Mine, Drift, Pgh. Connellsville Steam Coal, 7 ft. thick.
PO—Ligonier, Pa.; SP—Hannas Run, Pa.; CTY—Westmoreland. RR—Ligonier Valley.
MS—W. A. Beveridge.....Ligonier, Pa.
MM—Jos. Niccollozza, " "
S of H—Mules.
S of M—Hand.
EMP—74. Last fiscal year output 141,756 tons.

SENECA COAL MINING CO.
General Office, Prudential Bldg., Buffalo, N. Y.
Seneca Mine, Drift, Freeport Seam 5 ft. thick.
PO—Chambersville, Pa.; SP—Same; CTY—Indiana. RR—B. R. & P.
PR—W. M. Campbell, Buffalo, N. Y.
PA—W. M. Campbell, " "
GM—W. M. Campbell, " "
TR—Roger Joyce, " "
MS—Thos. Donnelly, Chambersville, Pa.
SM—S. B. Romaley, " "
EM—Thomas Pealer......Indiana, Pa.
SCO—Seneca Mercantile Co.; Buyer, D. H. McIntyre, Punxsutawney, Pa.
S of H—4 Elec. loco.
S of M—Compressed air machines.
PP—4 Water tube boilers, total 600 H. P.
EMP—250. Last fiscal year output 186,708 tons.
General Sales Agent, W. B. Nicol.

SEWICKLEY CREEK COAL CO.
General Office, Uniontown, Pa.
Klondike Mine; Drift; Pittsburgh Seam; 94 in. thick.
PO—Yukon, Pa.; SP—Same; CTY—Westmoreland; RR—Penna., Yukon branch.
PR—Harry Whyel......Uniontown, Pa.
GM—Harry Whyel, " "
PA—Harry Whyel, " "
TR—George Whyel, " "
GS—J. A. Abraham........Yukon, Pa.
MS—J. A. Abraham, " "
MM—Michael Haller, " "
S of H—2 elec. locos. Track gauge 42 in.
S of M—3 elec. mach.
PP—Purchase power.
EMP—30. Daily output, 200 tons.

SHADE CREEK COAL CO.
General Office, Johnstown, Pa.
Shade Creek Mine; Drift; B Coal Seam; 42 to 48 in. thick.
PO—Miller Run, Pa.; SP—Same; CTY—Somerset; RR—P. R. R., Shade Creek Extension.
PR—Jas. P. Thomas.....Johnstown, Pa.
Secy—F. D. Baker, " "
TR—Chas. A. Owen, " "
MS—Chas. A. Owen, " "
PA—Chas. A. Owen, " "
EE—Irwin Wilhelm, " "
SCO—Mill Run Supply Co. Buyer, Ed. Horn, Johnstown, Pa.
S of H—2 elec. locos. Track gauge 36 in.
S of M—4 elec. mach.
PP—1 pump. Purchase power.
EMP—130. Last fiscal year output 142,000 tons.

SHADE COAL MINING CO.
General Office, Mt. Pleasant, Pa.
Hagevo Mine, Drift, "B" or Miller Seam, 3 1-2 to 4 ft. thick.
PO—Hagevo, Pa., SP—Same, CTY—Somerset. RR—So. Fork Br., P. R. R.
PR—I. F. Overholt, Mt. Pleasant, Pa.
TR—J. W. Overholt, " "
GM—I. F. Overholt, " "
PA—I. F. Overholt, " "
MS—Geo. H. Austin.......Havego, Pa.
EM—A. C. Dickey & Co., Johnstown, Pa.
SCO—Havego Supply Co., Ltd., Buyer, Geo. H. Austin, Havego, Pa.
S of H—2 Gasoline loco., track gauge 36 in.
S of M—Hand and 3 elec. mach.
PP—440 volts A. C., 3 phase, 60 cycle. Buy power.
EMP—150. Last fiscal year output 68,249 tons.

SHANIL COAL CO.
Shanil Mine; Drift; Barnett Seam, 36 to 48 in. thick.
PO—Saxton, Pa.; SP—Riddlesburg, Pa.; CTY—Bedford; RR—H. & B. T.
PR—George Moyle, ...Saxton, Pa.
CM—George Moyle, " "
TR—R. L. Worsing, Philadelphia, Pa.
S of H— Mules.
S of M—Hand.
PP—Power purchased.
EMP—4.

SHANNON COAL CO.
Martha No. 3 and Martha Slope; Slope and Drift.
PO—Dudley, Pa.; SP—Same; CTY—Huntingdon; RR—H. & B. T.
GS—W. W. E. Shannon, Saxton, Pa.

SHANNON COAL & COKE COMPANY
General Office, Dawson, Pa.
Martha Nos. 2 and 3, Drift; Connellsville Seam, 84 to 108 in. thick.
PO—Dawson, Pa.; SP—Same; CTY—Fayette; RR—B. & O.
PR—Geo. H. Bortz......Uniontown, Pa.
TR—W. A. Stone, " "
GM—Geo. H. Bortz, " "
MS—Anton Luxner ......Dawson, Pa.
PA—W. A. Stone....Uniontown, Pa.
EM—M. A. Crawford, " "
S of H—Mules and 1 steam loco., track gauge 35 in.
S of M—Hand.
EMP—16. Output 100 tons per day.
Sales Agent, W. A. Stone, Uniontown, Pa.

SHARON COAL & LIMESTONE COMPANY.
PR—W. H. Clingerman, Carnegie Bldg., Pittsburgh, Pa.
TR—Philip Keller, Carnegie Bldg., Pittsburgh, Pa.
SECY—D. H. Cable.....Pittsburgh, Pa.
PA—T. S. Duncan, Carnegie, Bldg., Pittsburgh, Pa.
GS—F. P. Filer..........Mercer, Pa.
EM—J. H. Robinson, " "
EE—Irvin Spencer, " "
MS—John Marshall ......Volant, Pa.

No. 2 Mine; Shaft, Brookville Seam, 36 to 42 in. thick.
PO—Volant, Pa., R. F. D. No. 2, SP—Drake, Pa.; CTY—Lawrence; RR—P. R. R., Wolf Creek Br.
MF—Wm. Parry..........Volant, Pa.
S of H—Rope; track gauge 37 in.
S of M—6 Comp. air mach and hand.
PP—5 Return tubular boilers, total 500 H. P. 1 compressor, 3 pumps.
EMP—206. Last fiscal year output 129,157 tons.

Nos. 3 and 4 Mines; Drifts, Kittanning Seam.
PO—Slippery Rock, Pa.; SP—Redmond, Pa.; CTY Butler; RR—P. R. R., Wolf Creek Br.
MF—George McCrea and Henry Horseman, Slippery Rock, Pa.
S of H—Rope; track gauge 37 in.
S of M—Hand.
PP—Boiler 150 H. P., 1 pump.
EMP—168. Last fiscal year output 101,739 tons.

No. 5 Mine; Shaft, Brookville Seam.
PO—Mercer, Pa.; R. F. D. No. 6; SP—Drake, Pa.; CTY—Mercer; RR—Penna., Wolf Creek br.
MF—John Wallace, Volant, Pa., R. F. D. No. 65.
S of H—3 Elec. loco.; track gauge 37 in.
S of M—5 Elec., 8 comp. air mach.
PP—5 Return tubular boilers, total 550 H. P., gen. units 250 volts D. C., 2 compressors, 2 pumps.
EMP—239. Last fiscal year output 181,655 tons.

SHAWMUT MINING CO.
General Office, St. Mary's, Pa.
PR—Frank Sullibran Smith, New York, N. Y.
TR—H. S. Hastings, St. Mary's, Pa.
PA—H. S. Hastings, " "
GS—W. R. Craig, " "
SCO—Shawmut Commercial Co., Buyer, E. J. McLaughlin, St. Mary's, Pa.
Sales Agent, G. H. Jones, Buffalo, N. Y., Shawmut C. & C. Co.
No. 5 Elbon Mine; Drift; L. Kittanning Seam; 24 to 36 in. thick.
PO—Elbon, Pa.; SP—Same; CTY—Elk; RR—P. S. & N.
MS—James Jones.....Byrnedale, Pa.
SM—Harry Mullaney.......Elbon, Pa.
S of H—6 Elec. loco.; track gauge 30 in.
S of M—16 Elec. mach. and hand.
PP—2 Return tubular boilers, total 300 H. P., 2 gen. units 250 volts D. C., 1 comp. and 6 pumps.
EMP—218. Last fiscal year output 157,000 tons.

No. 10 Shawmut Mine; Drift; L. Kittanning Seam, 18 to 32 in. thick.
PO—Shawmut, Pa.; SP—Same; CTY—Elk; RR—P. S. & N.
MS—James Jones......Byrnedale, Pa.
SM—F. Jackson.......Shawmut, Pa.
S of H—1 Steam loco. and mules; track gauge 30 in.
S of M—Hand.
EMP—48. Last fiscal year output 14,000 tons.

No. 31 Byrnedale; Drift; L. Kittanning Seam, 32 to 44 in. thick. Washery, not in operation, 3|1|14.
PO—Byrnedale, Pa.; SP—Same; CTY—Elk; RR—P. S. & N.; Kersey Branch.
MS—James Jones......Byrnedale, Pa.
SM—L. H. Garbarino, " "
S of H—7 Elec. loco.; track gauge 30 in.
S of M—3 Elec. and 22 comp. air mach.
PP—6 Return tubular Erie boilers ,total 900 H. P., 2 gen. units 250 volts D. C., 3 air comp. and 6 pumps.
EMP—203. Coke ovens, 89 Bee Hive, 11 Ramsay. Last fiscal year output 116,000 tons.

No. 41 Cardiff Drift; L. Kittanning Seam 32 ti 44 in thick.
PO—Force, Pa.; SP—Same; CTY—Elk; RR—P. S. & N., Kersey Br.
MS—James Jones......Byrnedale, Pa.
SM—E. A. Hewitt.......Force, Pa.
S of H—1 Steam loco. and mules; track gauge 30 in.
S of M—Hand.
PP—1 Return tubular Erie boiler, 150 H. P., 1 comp. and 1 pump.
EMP—209. Last fiscal year output 133,000 tons.

No. 42 Brown's Run Mine; Drift; L. Kittanning Seam; 32 to 40 in. thick.
PO—Byrnedale, Pa.; SP—Same; CTY—Elk; RR—P. S. & N. Kersey Branch.
MS—James Jones......Byrnedale, Pa.
SM—L. H. Garbarino, " "
S of H—4 Elec. loco.; track gauge 40 in.
S of M—5 elec. mach. and hand.
PP—2 Return tubular boilers, Erie, total 300 H. P., 1 gen. unit; 250 volts D. C., 3 pumps.
EMP—177. Last fiscal year output 123,000 tons.

Ramsay Mine; Drift; L. Freeport Seam, 42 to 56 in. thick.
PO—Ramsaytown, Pa.; SP—Same; CTY—Jefferson; RR—P. S. & N., Ramsaytown Branch.
MS—Hugh Reynolds..Ramsaytown, Pa.
SM—J. E. Bixby, " "
S of H—4 Elec. loco.; track gauge 36 in.
S of M—24 Elec. mach. and hand.
PP—4 Return tubular, Union boilers, total 600 H. P., 2 gen. units, 250 volts D. C., 2 comp. and 2 pumps.
EMP—334. Last fiscal year output 330,000 tons.

SHEARN, JAMES G. & SON
Pittsburgh Seam, 5 ft. thick.
PO—Canonsburg, Pa., SP—Same, CTY—Washington; RR—P. R. R., Chartiers Valley branch.
PR—J. G. Shearn...Canonsburg, Pa.
MS—J. G. Shearn, "
TR—G. Scott Shearn, " "
PA—G. Scott Shearn, " "
S of H—Mules; track gauge 32 in.
S of M—Hand.
EMP—11.

SHENANGO COAL CO.
General Office, New Casle, P.a
PR—C. H. Johnson....New Castle, Pa.
TR—Thos. H. Hartman, " "
GM—David H. Kay.....New Castle, Pa.
GS—David H. Kay, " "
PA—W. H. Britton, " "
EM—J. W. Dinsmore, " "
MM—S. Barnes......Grove City, Pa.

Shenango Mine; Shaft, Brookville Seam, 42 to 50 in. thick.
PO—Grove City, Pa.; SP—Same; CTY—Mercer; RR—B. & L. E.
MS—James Thompson......Keister, Pa.
S of H—Mules.
PP—3 Erie City, water tube boilers, total 450 H. P., 2 pumps.
EMP—127. Last fiscal year output 52,000 tons.

Johnson Mine; Drift, Middle Kittanning Seam 36 to 51 in. thick.
PO—Keister, Pa.; SP—Hallston Station, Pa.; CTY—Butler RR—B. & L. E.
MS—James Thompson......Keister, Pa.
S of H—Mules.
PP—1 Erie City water tube boilers, 100 H. P.
EMP—92. Last fiscal year output 41,000 tons.

SHENANGO FURNACE CO. (THE)
General Office, 812 Oliver Bldg., Pgh, Pa.
Wilpen Mine; Drift; Pgh. Seam, 84 to 99 in. thick.
PO—Wilpen, Pa.; SP—Same; CTY—Westmoreland; RR—Ligonier Valley, Wilpen Br.
PR—W. P. Snyder....Pittsburgh, Pa.
Vice Pr—C. D. Dyer, " "
TR—Henry Irwin, Jr., " "
GM—A. K. Renwick.....Wilpen, Pa.
PA—Stewart Dyer, " "
CE—So. Penn Engineering Co., Uniontown, Pa.
MM—F. M. Ramsey,......Wilpen, Pa.
EE—W. A. Morrow, " "
MF—W. J. Penberthy, " "
SCO—Walker & Co., Inc., Buyer, Harry Walker, Wilpen, Pa.
S of H—3 elec. loco. and mules. Track gauge 42 in.
S of M—Hand.
PP—2 Stirling water tube boilers, total 590 H. P., 3 gen. units, 2300 volts A. C., 3 phase, 60 cycles, 250 volts D. C., 2 pumps.
EMP—300. Coke ovens, 167 Bee Hive. Last fiscal year output 350,000 tons.
Sales Agent, H. N. Wilson, Secy., Pittsburgh, Pa.

SHERWIN, SAMUEL
Kincaid and Enterprise Mines, Drifts; Freeport Seam 3 ft. 10 in. to 5 ft. thick.
PO—Karns City, Pa.; SP—Same; CTY Butler; RR—B. & O., Western Allegheny Div.
GS—Samuel Sherwin..Karns City, Pa.
SCO—Karns City Supply Co., Karns City, Pa.
S of H—1 Steam and 1 gasoline loco., mules and rope; track gauge 30 in.
S of M—6 comp. air mach.
PP—5 Return tubular boilers total 465 H. P. 3 air compressors.
EMP—132. Last fiscal year output 119,206 tons.

SHINN, W. H., COAL CO.
General Office, Diamond Bank Bldg., Pittsburgh, Pa.
PO—Burgettstown, Pa.; SP—Raccoon. Pa.; CTY—Washington.
PR—James H. Hammond..Pittsburgh, Pa.
GM—Wm. H. Shinn......Carnegie, Pa.
GS—W. H. Shinn......Carnegie, Pa.
PA—W. H. Shinn, " "
TR—W. H. Shinn, " "
MS—Robt. Carmichael, Burgettstown, "
S of H—3 elec. loco.
S of M—4 mach.
PP—2 pumps. Purchase power.
EMP—150.

SHOEMAKER COAL MINING CO.
General Office, 1507 Real Estate Trust Bldg., Phila., Pa.
PR—T. S. Shoemaker.....Phila., Pa.
PA—T. S. Shoemaker, " "
Sales agent, P. L. Wolfe, " "

Wilmore Nos. 1, 2 and 3 and Miller Slope Mines, Clope, Sonman Seam, 4 ft. thick.
PO—Myra, Pa.; SP—Portage and Lilly Pa.; CTY—Cambria; RR—I. R.R.
MS—Wm. Brown..........Myra, Pa.
S of H—Mules and rope.
S of M—Hand.
Output 1,500 tons daily.

SKELLY, W. B., COAL CO.
Elizabeth Mine, Drift, Pittsburgh Seam, 6 ft. thick.
PO—Export, Pa., SP—Same, CTY—Westmoreland; RR—P.R.R., Turtle Creek Valley.
PR—W. B. Skelly......Export, Pa.
TR—James C. Gray..Pittsburgh, Pa.
GM—W. B. Skelly......Export, Pa.
PA—W. B. Skelly, " "
GS—W. B. Skelly,
MS—Geo. M. Fink.........Export, Pa.
EM—Harrop, Hopkins & Taylor, Pittsburgh, Pa.
S of H—3 Elec. loco., track gauge 40 in.
S of M—Hand, and 3 Elec. machines.
PP—3 Titusville return tubular boilers, total 450 H. P., 2 gen. units 500 volts D. C.
EMP—99. Last fiscal year output 110,800 tons.

SMITH, IRA S.
Drift Mine; Lower Freeport Seam; 66 in. thick.
PO—Reynoldsville, Pa; SP—Big Run; CTY—Jefferson; RR—B. R. and P.
PR—Ira S. Smith,..Reynoldsville, Pa.
CE—M. L. Coulter, " "
S of H—Mules.
S of M—Hand.

SMITH, ROBERT, COAL CO.
Kokomo Mine; Drift, "E" Seam, 48 in. thick.
PO—Lilly, Pa.; SP—Same CTY—Cambria; RR—P. R. R.
PR—Robert Smith...........Lilly, Pa
TR—Robert Smith, " "
GM—Robert Smith, " "
PA—Robert Smith, " "
MS—Robert Smith, " "
EM—D. W. Sillyman....Altoona, Pa.
S of H—Steam loco; track gauge 36 in.
S of M—Hand.
EMP—29. Last fiscal year output 7,000 tons.

SMITHFIELD COAL & COKE CO
Burchinal Mine, Drift, Pgh. Seam, 6 to 7 ft. thick.
PO—Smithfield, Pa. SP—Same. CTY—Fayette. RR—B. & O.
PR—C. E. Wilson, Dunbar, Pa.
TR—R. S. Burchinal, Smithfield, Pa.
GM—R. S. Burchinal, " "
GS—R. S. Burchinal, " "
PA—R. S. Burchinal, " "
CE—Homer Burchinal, Uniontown, Pa.
MM—Samuel Tobin, Out Crop, Pa.
SCO—R. S. Burchinal, Smithfield, Pa. Buyer, W. J. Burchinal.
S of H—Mules. Track gauge 44 in.
S of M—Hand.
PP—2 Water Tube Boilers, total 90 H.P.
EMP—40. Last fiscal year output 24,000 tons. Coke Ovens—34 Bee Hive.

SMOKELESS COAL CO.
Smokeless No. 1 Slope; C Prime Seam; 42 to 54 ins. thick.
PO—Johnstown, Pa.; SP—Same; CTY—Cambria; RR—B. & O.
PR—Jas. P. Thomas....Johnstown, Pa.
TR—Wm. R. Thomas " "
GS—Chas. A. Owen " "
MS—Chas. A. Owen " "
PA—Frank D. Baker " "
S of H—Mules, 1 elec. loco. and Rope.
S of M—Hand and 1 elec. mach.
PP—1 pump. Purchase power.
EMP—125. Last fiscal year output 81,000 tons.

Smokeless No. 2 Mine; Drift; E. Coal Seam; 42 to 46 in. thick.
PO—Johnstown, Pa.; SP—Same; CTY—Cambria; RR—B. & O., S. & C. Br.
S of H—Mules, Track gauge 36 in.
PP—1 pump.
EMP—11. Last fiscal year output 14,200 tons.

SNOWDEN COKE COMPANY
General Office, Pittsburgh, Pa.
Mt. Hope Mine; Drift; Pittsburgh Seam; 84 to 96 in. thick.
PO—Braznell, Pa.; SP—Linn Station, Pa.; CTY—Fayette; RR—Penna., P. V. & C. Br.
PR—C. L. Snowden,...Brownsville, Pa.
MS—John O'Connell, " "
EE—John Hughes, " "
TR—T. W. Friend......Pittsburgh, Pa.
GM—Isaac Taylor......Uniontown, Pa.
PA—Isaac Taylor, " "
EM—Fayette Engineering Co. " "
GS—Alva Gilleland.......Braznell, Pa.
SCO—Mt. Hope Supply Co. " "
S of H—4 elec. locos.
S of M—Hand and 4 elec. mach.
PP—Purchase power.
EMP—220. Last fiscal year output 264,020 tons. 300 rectangular or Belgian coke ovens.
Note—Successors to Mt. Hope Coke Co.

SOISSON, JOS. FIRE BRICK CO.
General Office, Connellsville, Pa.
Indiana Mine; Drift; "B" Seam, 36 to 42 in. thick.
PO—Bolivar, Pa.; SP—Same; CTY—Westmoreland; RR—P.R.R., West Penn Div.
PR—Jos. Soisson ....Connellsville, Pa.
TR—W. F. Soisson, " "
GM—W. F Soisson, " "
PA—F. W. Neuroth, " "
EM—R. R. Soisson......Boliver, Pa.
MS—R. R. Soisson, " "
SM—E. R. Hammond, " "
S of H—Mules and 9 gasoline locos. Track gauge 37 in.
S of M—Hand.
PP—5Boilers total 600 H. P., 3 pumps.
EMP—35. Last fiscal year output 10,000 tons.

SOMERSET MINING CO
Knickerbocker No. 1, Drift, B Seam, 3½ to 5 ft. thick.
PO—Hooversville, Pa. SP—Same. CTY—Somerset. RR—B. & O., Rockwood Branch.
PR—F. M. Graff,... Blairsville, Pa.
TR—W. P. Graff, " "
GM—Telford Lewis, Hooversville, Pa.
PA—Telford Lewis, " "
EM—R. A. Suppes, " "
MM—W. E. Nevling, " "
EE—W. E. Nevling, " "
SCO—Hooversville Supply Co, Hooversville, Pa.
SM—C. L. Stewart, Hooversville, Pa.
S of H—3 Elec. loco., track gauge 36 in.
S of M—2 Elec. machines and hand
PP—2 boilers, total 300 H.P., 250 volts D.C.
EMP—190. Last fiscal year output 211,908 tons. Sales Agents, Knickerbocker Fuel Co., New York.

SOMERSET-QUEMAHONIING SMOKELESS COAL CO.
Now Chas. R. McMillan.

SONMAN SHAFT COAL CO.
General Office, Minersville, Pa.
Sonman Mine; Shaft and Slope; "E" or Lemon Seam; 42 to 50 in. thick.
PO—Sonman, Pa.; SP—Portage, Pa.; CTY—Cambria; RR—P. R. R., Sonman Br.
PR—Jas. B. Neale......Minersville, Pa.
GM—Jas. B. Neale, " "
VP—Vance C. McCormick, " "
Secy—Jas. H. Collier, " "
TR—S. B. Thorne......New York, N. Y.
PA—Jas. Strachan........Sonman, Pa.
MS—Jas. Srachan, " "
MM—W. C. Cooper, " "
EE—R. B. Clayton, " "
EM—J. S. Sillyman........Altoona, Pa.
SCO—Sonman Store Inc. Buyer, Latt. B. Callahan, Sonman, Pa.
S of H—Rope, mules, and 4 elec. loco. Track gauge 36 and 42 in.
S of M—Hand and 8 Elec. mach.
PP—7 boilers, total 1150 H. P., 3 gen. units, 250 volts D. C., 3 pumps.
EMP—550. Last fiscal year output 326,223 tons.

SORGE BROS.
Sorge Mine.
PO—Homestead, Pa. R. F. D. No. 1. CTY—Allegheny.

SOUTH FAYETTE COAL CO.
Melrose Mine; Slope; Pgh. Seam, 5 1-2 to 6 1-2 ft. thick.
PO—Bridgeville, Pa.; SP—Same; CTY—Allegheny; RR—P. C. C. & ST. L., Chartiers Branch.
PR—E. R. Weise,....Bridgeville, Pa.
GM—E. R. Weise, " "
GS—E. R. Weise, " "
TR—Frank E. Weise, " "
CE—Randolph & Means, Pittsburgh, Pa.
EM—Andrews & Southard, " "
SCO—Harmuth Bros......Bridgeville, Pa.
S of H—Rope; track gauge 42 in.
S of M—4 elec. mach.
PP—Power purchased. 2 pumps.
EMP—115. Last fiscal year output 81,000 tons.

SOUTH FAYETTE COKE CO
General Office, ... Uniontown, Pa.
PR—J. W. Abraham, " "
TR—J. W. Semans, " "
GM—J. W. Abraham, " "
GS—J. W. Abraham, " "
PA—J. W. Abraham " "
EM—F. G. Christopher, " "
SCO—Fretts Supply Co., " "
Buyer, Alfred Franks, Messmore, Pa. Sales Agents, Producers Coke Co, Uniontown, Pa.

Fretts Mine, Slope, Pittsburgh Seam, 9 ft. thick.
PO—Messmore, Pa. SP—Same. CTY—Fayette. RR—P. R. R.
MS—F. G. Christopher Uniontown, Pa.
S of H—Rope; track gauge 42 in.
S of M—Hand.
PP—1 boiler, 150 H.P.
EMP—73. Last fiscal year output 44,700 tons. 80 Bee Hive coke ovens.

Shirey Mine, Drift, Pittsburgh Seam, 9 ft. thick.
PO—Baggaley, Pa. SP—Same. CTY—Westmoreland. RR—P. R. R.
MS—W. I. Jenkins, Baggaley, Pa.
S of H—Elec. Track gauge 42 in.
S of M—Hand.
PP—Buy power.
EMP—39. Last fiscal year output 12,173 tons. 36 Bee Hive coke ovens.

Emery Mine, Drift, Pittsburgh seam, 9 ft. thick.
PO—Leckrone, Pa. SP—Same. CTY—Fayette. RR—B. & O.
MS—S. J. Sterling, Leckrone, Pa.
S of H—Mules, track gauge 42 in.
S of M—Hand.
EMP—17. Last fiscal year output, 8,928 tons. 32 Bee Hive coke ovens.

SOUTH FORK COAL MINING CO.
General Office, 421 Chestnut St., Philadelphia, Pa.
South Fork, No. 2 Mine; Slope.
PO—South Fork, Pa.; SP—Same CTY—Cambria; RR—P.R.R.
PR—J. S. W. Holton,..Philadelphia, Pa.
TR—M. L. Preston, " "
PA—Address the General Office.
CE—Fetterman Engineering Co., Johnstown, Pa.
MS—Patrick Quinn....South Fork, Pa
S of H—Rope and mules.
S of M—Hand and mach.
PP—3 Boilers total 375 H. P., 1 comp. and 1 pump.
EMP—180.

SOUTH LIGONIER COAL CO.
No. 1 Mine. Drift, Pgh. Seam 7 to 9 ft. thick
PO—Ligonier, Pa.; SP—Same; CTY—Westmoreland; RR—Ligonier Val.
TR—Geo. W. Deeds....Ligonier, Pa.
PA—Geo. W. Deeds, " "
GM—W. H. Lowry, " "
MS—W. H. Williams, " "
EM—W. H. Matthews " "
S of H—Mules and gravity; track gauge 40 in.
EMP—50. Last fiscal year output 45,000 tons.
Sales Agent, H. A. Tomkins, Portage, Pa.

SOUTHERN CONNELLSVILLE COKE CO
General Office, Uniontown, Pa.
Marion Mine, Drift, Pgh. Seam, 5 to 8 ft. thick.
PO—Cheat Haven, Pa. SP—Same CTY—Fayette. RR—B. & O.
PR—F. E. Markell,.. Uniontown Pa.
TR—J. R. Davidson, " "
GM—S. A. Carson, " "
PA—S. A. Carson, " "
GS—S. A. Carson, " "
EM—H. L. Burchinal, " "
MS—Andrew Laing, Cheat Haven, Pa.
SCO—Cheat Haven Supply Co. Buyer, T. M. Bowman, Cheat Haven, Pa.
S of H—Mules. Track gauge 42 in.
S of M—Hand.
EMP—92. 64 Bee Hive Coke Ovens. Last fiscal year output, 75,000 tons. Sales Agent, S. A. Carson, Uniontown, Pa.

SPRINGFIELD COAL MINING CO.
Nos. 1, 2 and 3 Mines; Slopes and Drift; B Seam, 42 to 48 in. thick.
PO—Nanty-Glo, Pa. SP—Same; CTY—Cambria; RR—P. R. R., Indiana Br.
PR—H. A. Tompkins....Nanty-Glo, Pa.
TR—Enoch Bellis, " "
GM—Enoch Bellis, " "
PA—Enoch Bellis, " "
GS—Enoch Bellis, " "
CE—Wm. Weary, " "
MM—Wm. Schrode, " "
SM—Jos. Griffith, " "
S of H—5 Elec., 1 steam loco; track gauge 42 in.
S of M—1 Elec. mach. comp. air and hand.
PP—5 R turn tubular boilers, total 690 H. P., 1 motor set 200 K. W., 3 compressors, 5 pumps.
EMP—400. Last fiscal year output 248,000 tons.

STANDARD COAL CO.
General Office, Altoona, Pa.
Standard Mine; Drift; B Seam;
PO—Lilly, Pa.; SP—Same; CTY—Cambria RR—P. R. R., Lilly Br.
PR—P. N. Rich..........Altoona, Pa.
GM—P. N. Rich, " "
CE—P. N. Rich, " "
TR—Samuel Wilson, " "
MS—Charles McGill..........Lilly, Pa.
EM—Charles McGill, " "
S of H—Mules.
S of M—Hand.
PP—1 boiler, 30 H. P.
EMP—42. Last fiscal year output 24,000 tons. Sales Agent, P. M. Rich, Altoona, Pa.

STANDARD COAL MINING CO
General Office, Grove City, Pa.
Standard Mine, Drift Mine, Brookville Seam, 78 in. thick.
PO—Argentine, Pa. SP—Argentine, Pa. CTY — Butler RR — Bessemer Hilliard Branch.
TR—Harry Hamilton, Grove City, Pa.
GM—Harry Hamilton, " " "
PA—Harry Hamilton, " " "
GS—John C. Hamilton, Argentine, Pa.
S of H—Elec. loco.; track gauge 37 in.
S of M—Elec. mach.
EMP—100. Last fiscal year output 50,000 tons.

STANDARD MOSHANON COAL CO.
General Office, Williamsport, Pa.
Standard No. 4; Drift; "D" Seam.
PO—Smoke Run, Pa.; SP—Same; CTY—Clearfield; RR—P. R. R.
PR—W. H. Spencer,...Williamsport, Pa.
GM—G. W. H. Miller....Salstburg, Pa.
TR—W. H. Spencer..Williamsport, Pa.
MS—R. D. Lamb......Smoke Run, Pa.
S of H—Mules.
S of M—Hand.
EMP—59. Last fiscal year output 36,279 tons.

STANDARD-QUEMAHONING COAL CO.
Nos. 1 and 2; Drift; Miller and "C" Prime Seam, 45 to 48 in. thick.
PO—Boswell, Pa. SP—Same; CTY—Somerset; RR—B. & O., Quemahoning Branch.
PR—Gustus Volk........Boswell, Pa.
TR—F. Freese, " "
GM—Gustus Volk, " "
GS—Frank D. Allen, " "
PA—Frank D. Allen, " "
MS—Geo. Hartshorn, " "
EM—Chas. Hurd, " "
S of H—Rope, mules and 1 steam engine. Track gauge 42 in.
S of M—Hand.
PP—1 return tubular boiler, 1 gen. unit, 1 pump.
EMP—35. Last fiscal year output 31,000 tons.

STAR COAL CO
General Office, Pittsburgh, Pa.
Star Mine, Drift. Pgh. Seam, 4½ ft. thick.
PO—Courtney, Pa. SP—Same. CTY—Washington, Pa. RR—P. R. R., Monon. Div.
PR—H. W. Croft,. Pittsburgh, Pa.
GM—H. W. Croft, " "
TR—Wm. Walker, " "
PA—C. T. Stewart, " "
GS—Nin McQuillen, Clearfield, Pa.
MS—John C. Rue, Courtney, Pa.
S of H—1 Elec. mach. and endless rope. Track gauge 36 in.
S of M—7 Elec. Mach.
PP—2 Return tubular boilers, total 200 H.P. I gen. unit 250 volts D.C. 2 pumps.
EMP—120.
Sales Agency, J. H. Hillman & Sons Co., Pittsburgh, Pa.

STATE LINE COAL CO
State Line Mine, Drift, No. 6 and 7 Seams, 3 to 4½ ft. thick.
PO—E. Palestine, Ohio. SP—Same CTY—Columbiana. RR — P. F. W. & C.
PR—James Mullins.
TR—C. A. McDonals.
PA—F. P. Mullins.
MS—H. Laughlin, East Palestine, O.
S of H—Mules and rope. Track gauge 39 in.
S of M—Hand.
EMP—200. Last fiscal year output, 150,000 tons.
Idle for past two years.

STAUFFER-QUEMAHONING COAL CO.
PR—John M. Stauffer....Scottdale, Pa.
TR—E. T. Norton....Connellsville, Pa.
GS—W. V. Whiteman.......Listie, Pa.
PA—W. V. Whiteman, " "
MS—W. V. Whiteman. " "
EM—W. V. Whiiteman, " "
EE—H. G. Fink, " "
SCO—Walls Creek Supply Co. Buyer, Clarence Larmon, Listie, Pa.

Stauffer No. 1 Mine; Slope; "E" or U. F. Seam; 38 to 42 in. thick.
PO—Listie, Pa.; SP—Same; CTY—Somerset; RR—B. & O., S. & C. Br.
S of H—6 elec. locos. Track gauge 40 in.
S of M—1 elec. mach.
PP—4 return tubular boilers, total 550 H. P., 1 gen. unit, 250 volts D. C., 2 pumps.
EMP—150. Last fiscal year output 140,000 tons.

Stauffer No. 2 Mine Drift; "C" Prime Seam; 36 to 60 in. thick.
PO—Listie, Pa.; SP—Wells Creek; CTY—Somerset; RR—B. & O.
S of H—Mules and rope. Track gauge 40 in.
S of M—Hand.
PP—2 return tubular boilers, total 200 H. P., 1 gen. unit, 250 volts D. C. Purchase power.

Stauffer No. 3 Mine; Drift; "D" or L. F. Seam; 30 to 54 in. thick.
PO—Listie, Pa.; SP—Wells Creek; CTY—Somerset; RR—B. & O.
S of H—Mules and 1 elec. loco. Track gauge 40 in.
PP—1 gen. unit, 250 volts D. C., Purchase power.
Note—Idle during 1915.

STEEL RUN COAL CO.
Philipsburg, Pa. No report.

STERLING COAL CO.
General Office, 421 Chestnut St., Philadelphia, Pa.
Sterling Nos. 1, 3, 5, and 6 Mines; Drift; B or Miller Seam.
PO—Elmora, Pa. SP—Bakerton, Pa. CTY—Cambria. RR—P. R. R.
PR—J.S.W.Holton, Philadelphia, Pa.
PA—F. S. Claypoole, " "
TR—DeVeaux Powel, 29 Broadway, N.Y.
GS—Patrick Quinn........Elmora, Pa.
EE—Jos. McNally........Elmore, Pa.
EM—C. E. Schlicher....Spangler, Pa.
S of H—Elec. loco.
S of M—Mach.
PP—11 boilers, total 1500 H. P., 250
EMP—800.

STERLING COAL MINING CO.
Woodland, Pa. No report.

STEWART IRON CO., LTD.
General Office, Sharon, Pa.
Stewart Mine, Slope, Pittsburgh Seam.
PO—Uniontown, Pa. SP—Evans Station, Pa. CTY—Fayette. RR—B. & O.
GM—Samuel McClure, .. Sharon, Pa.
PA—Thos. W. Keighley, Uniontown "
MS—Thos Keighley, " "
EM—G. W. Nicholls.......Sharon, Pa.
S of H—Rope.
S of M—Hand.
PP—4 boilers, total 600 H. P.
EMP—150.

STEWART COAL CO.
GM—W. B. Warren, ... Knoxdale, Pa.
TR—W. S. Reid, " "
GM—W. S. Reid, " "
PA—I. N. Stewart, " "
EM—A. L. Burton, Du Bois, Pa.
MM—Wm. B. Hayes.
Sales Agency, Shawmut Coal & Coke Co., Buffalo, N. Y.

Stewart Nos. 2 and 3 Mines. L. Freeport Seam, 6 to 4½ ft. thick.
PO—Knoxdale, Pa. SP—Same. CTY—Jefferson. RR—P. S. N. R. R. Co.
S of H—Mules. Track gauge 36 in.
S of M—8 Comp. air mach.
PP—1 Return tubular boilers, 150 H. P., 1 compressor and 3 pumps.
EMP—90. Last fiscal year output, 118,904 tons.

Timblin No. 4 Mine; Drift; Up Freeport Seam, 4 to 5 ft. thick.
PO—Timblin, Pa.; SP—Same; CTY—Jefferson; RR—P. S. N.
S of H—2 elec. loco. Track gauge 36 in.
S of M—4 elec. mach.
PP—2 Return tubular boilers, total 300 H. P., gen. unit 150 volts D. C. H.P.; gen. unit 250 volts D.C.
Last fiscal year output 97,196 tons.

STEWARTON COAL CO.
See Dornon Coal Co.

STINEMAN COAL & COKE CO.
General Office, 421 Chestnut Street, Philadelphia, Pa
PR—Robt. B. Baker, New York N. Y.
TR—James H. Atkinson, Philadelphia, Pa.
GM—W. I. Stineman, South Fork, Pa.
PA—W. I. Stineman, South Fork, Pa
EM—Geo. A. Gardner..South Fork, Pa.
MM—A. Crane, South Fork, Pa.

Stineman No. 2 Mine, Drift, "B" Seam, 4 ft. thick.
PO—South Fork, Pa. SP—Same. CTY—Cambria. RR—P. R. R., Main Line.
S of H—3 Elec. Mach. Track gauge 2 ft 6 in.
S of M—Hand.
PP—1 Return tubular boiler, 150 H. P. Gen. units 500 volts, D. C. 3 pumps.
EMP—233. Last fiscal year output, 187,834.

Stineman No. 4 Mine, Slope, "B' Seam, 4 ft. thick.
PO—South Fork, Pa. SP—Same. CTY—Cambria. RR—P. R. R., Main Line.
MS—W. L. Dunmire...South Fork, Pa.
S of H—Rope, Track gauge 2½ ft.
S of M—Hand.
PP—4 Return tubular boilers, total 600 H.P.
EMP—152. Last fiscal year output, 117,118.

STINEMAN COAL MINING CO.
General Office, Penna. Bld'g., Philadelphia, Pa.
Stineman No. 1 Mine, Drift, "B" Seam, 4 ft. thick.
PO—South Fork, Pa. SP—Same CTY—Cambria. RR—P. R. R., Main Line.
PR—James S. Whiteley, Baltimore, Md.
TR—Leon Walker, Wilmington, Del.
GM—W. I. Stineman, South Fork, Pa.
PA—W. I. Stineman, " " "
MM—W. W. Dunmire, " " "
MS—E. Morgan, " " "
EM—Geo. A. Gardner, " " "
SCO—Stineman Bros. Supply Co., buyer, Lewis Yost, South Fork, Pa.
S of H—5 elec. loco. Track gauge 2 ft. 6 in.
S of M—Hand.
PP—4 Return tubular boilers, total, 600 H.P Gen. units 500 volts A. C.
EMP—280. Last year's fiscal output, 232,552.

STINEMAN, H. C.
Stineman No. 5, Drift, C Prime Seam, 3½ to 4 ft. thick.
PO—South Fork, Pa. SP—Same. CTY—Cambria.
PR—H. C. Stineman, South Fork, Pa.
GM—H. C. Stineman, " " "
GS—H. C. Stineman, " " "
PA—H. C. Stineman, " " "
MS—Wm. Roberts, " " "
EM—S. G. Fetterman, Johnstown, Pa.
S of H—Mules, Rope and gravity.
S of M—Hand.
EMP—80. Last fiscal year output, 25,000 tons.

STONER COAL CO.
Stoner Nos. 1 and 2 Mines; Drifts; Price Seam, 48 in. thick.
PO—Berlin, Pa. SP—Same. CTY—Somerset. RR—B. & O., Berlin Branch.
TR—H. K. Stoner,..... Berlin, Pa.
PA—H. K. Stoner, " "
MS—C. J. .Baker, " "
S of H—Mules. Track gauge, 40 in.
S of M—Hand.

STOTT, JAMES F.
Red Jacket Nos. 1, 2 and Coaldale, Mines, Drift.
PO—Philipsburg, Pa. SP—Same. CTY - Center. RR—N. Y. C.
GM—James Stott, .. Philipsburg, Pa.
PA—James Stott, "
MS—Jas McConville, " "
MS—John P. Rapsey, " "
S of H—Mules.
S of M—Hand.
EMP—(1 and 2) 50.

STRANGFORD COAL COMPANY.
Strangford Mine, Drift; "E" or Up. Freeport Seam; 3 ft. 6 in. thick.
PO—Blairsville, Pa.; SP—Strangford. Pa.; CTY—Indiana; RR—P.R.R., Conemaugh, Div.
TR—W. P. Graff.....Blairsville, Pa.
GM—F. M. Graff, " "
PA—F. M. Graff, " "
MS—Ernest Fletcher....Saltsburg, Pa.
SM—Ward Donahue,
R.F.D. No. 4, Blairsville, Pa.
CE—Albert Smith......Saltsburg, Pa.
EM—Albert Smith......Saltsburg, Pa.
MM—Chancey Shipley. " "
SCO—Kiskiminetas Supply Co., Blairsville, Pa., Buyer, Wm. G. Fletcher, Blairsville, Pa.
S of H—Tail rope, mules and comp. air loco., track gauge 36 in.
S of M—Hand and 15 comp. air mach.
PP—2 Erie City return tubular boilers total 300 H. P., 1 engine; 2 air comp., 3 pumps.
EMP—111. Last fiscal year output 66,604 tons.
Sales Agent, Knickerbocker Fuel Co., New York, N. Y.

STRUTHERS COAL & COKE CO.
General Office, Cleveland, Ohio.
Struthers Mine, Shaft, Pittsburgh Seam; 84 to 108 in. thick.
PO—Fairbank, Pa.; SP—Same, Pa.; CTY—Fayette; RR—Monongahela R. R. Co.
PR—Walter C. Runyon, New York, N. Y.
TR—A. Grossman.........Cleveland, O.
GM—W. C. Runyon, Jr., Cleveland, O.
PA—F. W. Ream, " "
CE—Geo. E. Gay......Uniontown, Pa.
MS—H. C. Bartel.......Fairbank, Pa.
MM—Wm. Hoffman " "
SCO—New Salem Supply Co. Buyer, T. R. Lynch, Fairbank, Pa.
S of H—Mules and 2 comp. air loco. Track gauge 42 in.
S of M—Hand.
PP—4 B. & W. water tube boilers, 1 return tubular boiler, total 950 H. P., 2 gen. units, 250 volts D. C., 2 air compressors and 1 pump.
EMP—200. Coke ovens, 200 Bee Hive. Last fiscal year output 152,200 tons.

STYER COAL CO.
See Geo. W. Bailey Co.

SUGAR RUN COAL MINING CO.
General Office, Altoona, Pa.
PR—B. F. MacCartney....Altoona, Pa.
GM—B. F. MacCartney, " "
GS—B. F. MacCartney, " "
PA—B. F. MacCartney, " "
TR—H. E. Clark, " "
EM—Cambria Steel Co., Johnstown, Pa.

Sugar Run Mine No. 1; Drift; "D" Seam; 36 to 42 in. thick.
PO—Tunnell Hill, Pa.; SP—Gallitzin; CTY—Blair; RR—Penna., New Portage branch.
MS—James McCoy....Tunnell Hill, Pa.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
EMP—52. Last fiscal year output 30,211 tons.

Dysart No. 1 and 2 Mines; Drifts; "C" Prime and "B" or Miller Seams; 45 to 54 in. thick.
PO—Dysart, Pa.; SP—Same; CTY—Cambria; RR—Penna.
MS—John Stuart.........Dysart, Pa.
S of H—2 elec. locos. Track gauge 36 in.
S of M—2 elec. mach.
PP—1 return tubular boiler, total 150 H. P., 1 gen. unit, 250 volts D. C.
EMP—52. Daily output 200 tons.
Note—Formerly the Richmond Coal & Mining Co.

Milsom Mine; Drift; "D" Seam; 44 to 48 in. thick.
PO—Carrolltown, Pa.; SP—Carrolltown, Roads, Pa.; CTY—Cambria; RR—N. Y. C.
MS—C. H. Milsom....Carrolltown, Pa.
S of H—Mules.
EMP—57.
Note—Formerly the Milson Coal Co.

SUMMIT COAL MINING CO.
General Office, Punxsutawney, Pa.
Summit, Dayton Nos. 1 and 2 Mines, Slopes, Up. Freeport Seam.
PO—Dayton, Pa. SP—Same. CTY—Armstrong. RR—B. R. & P.
PR—S. A. Rinn, Punxsutawney, Pa.
GM—S. A. Rinn, " "
TR—E. H. Winslow, " "
PA—E. H. Winslow, " "
GS—W. N. Trussell, " "
CE—H. M. Kanarr, " "
MM—E. C. Jenkin, ... Dayton, "
MS—S. C. McIlenry, " "
S of H—3 Elec. locos. and rope. Track gauge 42 in.
S of M—3 elec. and 5 comp. air machines.
PP—8 water tube boilers, total 800 H. P., 6 units, 500 volts D. C., 3 compressors and 7 pumps.
EMP—200. Last fiscal year output 150,000 tons.

SUMMIT-CONNELLSVILLE COAL & COKE CO.
Summit Mine; Drift; Pittsburgh Seam; 108 in. thick.
PO—Connellsville, Pa.; SP—Owensdale, Pa.; CTY—Fayette; RR—B. & O.; P. R. R. Branch Broadford.
TR—A. C. Stikel....Connellsville, Pa.
PA—A. C. Stikel " "
MS—Carl Keck.........Scottdale, Pa.
S of H—Mules.
Output 300 tons per day.

SUPERIOR COAL CO.
Superior D Mine; Drift; "B" Seam; 4 ft. thick.
PO—Lochvale, Pa.; SP—Glen Campbell, Pa.; CTY—Indiana; RR—P.R.R., P. & N. W.
PR—Franklin H. Skeele, 90 West St., New York.
TR—J. O. Clark...Glen Campbell, Pa.
GS—J. H. Miller, " " "
PA—J H. Miller, " " "
MS—S. S. Lamborn......Lochvale, Pa.
SCO—Lochvale Supply Co., Buyer, W. S. Martz, Glen Campbell, Pa.
S of H—Mules, track gauge 42 in.
S of M—Hand and 2 elec. mach.
PP—1 pump; power purchased.
EMP—124. Last fiscal year output 58,572 tons. Sales agent, Clark Bros. Coal Mng. Co. and Skeele Coal Co.

SUPERIOR FUEL COMPANY
General Office, Russellton, Pa.
Superior Mine; Shaft; Freeport Seam; 66 to 90 in. thick.
PO—Russellton, Pa.; SP—Same; CTY—Allegheny; RR—B. & L| E.
PR—R. K. Gassatt...Philadelphia, Pa.
TR—M. W. Saxman......Latrobe, Pa.
GM—Carel Robinson....Russellton, Pa.
GS—Carel Robinson, " "
PA—Carel Robinson, " "
MS—Carel Robinson, " "
EM—Robert Morris.....Greensburg, Pa.
SCO—Russellton Store Co. Buyer, W. C. Burns, Russellton, Pa.
S of H—Mules and 1 elec. loco.
S of M—4 elec. mach.
PP—5 return tubular boilers, total 750 H. P., 1 gen. unit, 250 volts D. C., 1 air compressor, 2 pumps.
EMP—200. 5-22-16. Now shipping 23,000 tons per month.

SUPPES COAL COMPANY.
General office, Suppes Bldg., Johnstown, Pa.
Suppes Mine, Drift, C. Prime or Cement Seam, 36 to 42 in. thick.
PO—Johnstown, Pa.; CTY—Cambria.
PR—C. H. Suppes, Jr., Johnstown, Pa.
GS C. H. Suppes, Jr.....Johnstown, Pa.
MS—John Rees, " "
EM—S. E. Dickey & Co., Johnstown Trust Bldg., Johnstown, Pa.
S of H—Mules. Track gauge 34 in.
S of M—Hand.
PP—Buy Power.
EMP—50. Last fiscal year output 36,411 tons.

SUTTER COAL CO.
Valier Mines Nos. 1 and 2, Drifts. Lower Freeport Seam, 3 to 4 ft. thick.
PO—Valier, Pa. SP—Same. CTY—Jefferson. RR—B. R. & P.
PR—A. P. Sutter, ... Valier, Pa.
TR—E. H. Winslow..Punxsutawney, Pa.
GM—A. P. Sutter.........Valier, Pa.
PA—A. P. Sutter, " "
MS—Nick Barnoff....Punxsutawney, Pa.
MM—Wm. Harmon.........Valier, Pa.
SCO—Valier Supply Co. Buyer, M. C. Sutter, Valier, Pa.
S of H—Mules and rope. Track gauge 36 in.
S of M—Hand.
chines.
PP—2 Water tube boilers, total 150 H.P. 1 Air Compressor and 2 pumps.
EMP—65. Last fiscal year output 60,000 tons.

SWOOPE, H B & CO
Sylvania, Morgan Run, King and No. 18 Mine; Slope; "B" and "D", Seams 42 to 60 in. thick.
PO—Madera, Pa. SP—Same. CTY—Clearfield; RR—P. R. R., Tyrone Div. Y. C. & H. R. R. R.
PR—H. B. Swoope, ... Madera, Pa.
PA—H. B. Swoope, " "
MS—John Stevenson, " "
EM—S. R. Moore, " "
SCO—Madera Trading Co., Buyer, G. B. Curry, Madera Pa.
S of H—Mules, 2 gasoline and 2 elec. loco. Track gauge 37 in.
S of M—Hand, 7 elec. and 30 comp. air mach.
PP—5 pumps. Purchase power.
EMP—300. Last fiscal year output 142,620 tons.

Vivian Mine; Slope; C Vein; 36 in. thick.
PO—Utahville, Pa.; SP—Heverly; CTY—Clearfield; RR—P. & N. W.
MS—P. J. White........Coalport, Pa.
S of H—Rope. Track gauge 36 in.
PP—1 water tube boiler, total 100 H. P., 1 pump.
EMP—50. Last fiscal year output 17,000 tons.
Note—Formerly operated by the Vivian Coal Company.

TARENTUM COAL & STONE CO.
Tarentum Mine; Drift, L. Freeport Seam, 33 to 39 in. thick.
PO—Tarentum, Pa.; SP—Same; CTY—Allegheny; RR—P. R. R., W. Penn Br.
PR—McKinstry Griffith...Tarentum, Pa.
TR—J. M. Griffith, " "
GM—J. M. Griffith, " "
PA—J. M. Griffith, " "
MS—Sheridan John.....Tarentum, Pa.
S of H—Mules; track gauge 34 in.
S of M—1 elec. mach.
PP—Power purchased.
EMP—12. Last fiscal year output 7,509 tons.

TAYLOR COAL & COKE CO.
General Office, Cleveland, O.
Searight, Shaft, Pittsburgh Seam.
PO—Uniontown, Pa. SP—Low Phos. CTY—Fayette. RR—Monon.
PA—D. B. Stauft, .. Uniontown, Pa.
GS—D. B. Stauft,
MS—J. J. McIntyre, " "
EE—J. A. McMillen, " "
S of H—Rope and 2 elec. locos.
S of M—Hand.
PP—8 boilers, total 1,200 H. P., gen unit, 250 volts D. C. Coke ovens, 378.

TAYLOR & McCOY COAL & COKE CO.
General Office, Baltimore, Md.
Gallitzin Mine; Shaft; "E" or Lemon Seam, 46 to 51 in. thick.
PO—Gallitizin, Pa.; SP—Same; CTY—Cambria; RR—P. R. R.
PR—C. J. Taylor, ...Baltimore, Md.
TR—C. G. Osborne, " "
GM—F. J. Taylor, " "
GS—F. D. McNellis, ..Gallitzin, Pa.
PA—F. D. McNellis, " "
MS—F. D. McNellis, " "
EM—J. S. Sillyman & Co., Altoona, Pa.
MM—Henry Fisher, " "
EE—Henry Fisher, " "
SCO—Address the Co. Buyer A. T. Stauffer, Gallitzen, Pa.
S of H—1 Elec. loco.; track gauge 36 in.
S of M—6 Elec. mach.
PP—4 Madden and 1 Erie return tubular boilers, total 780 H. P., 2 gen. units, 250 volts D. C., 1 pump.
EMP—200. Coke ovens—212 Bee Hive. Last fiscal year output 171,714 tons.

TELFORD COAL CO.
Telford No. 1 Mine; Drift; "E" Seam; 48 to 53 in. thick.
PO—Johnstown, Pa.; SP—Same; CTY—Cambria; RR—Penna.
PR—F. M. Graff,......Blairsville, Pa.
TR—W. P. Graff " "
GM—Telford Lewis, " "
PA—Telford Lewis, " "
MS—S. B. Jones " "
EM—R. A. Suppes, " "
EE—W. E. Nevling, " "
S of H—1 elec. loco. Track gauge 42 in.
S of M—Hand and elec. mach.
PP—Power purchased.
EMP—54.

TEN MILE COKE CO.
General Office, Uniontown, Pa.
Besco Mine; Slope; 78 to 84 in. thick.
PO—Millsboro, Pa.; SP—Besco, Pa.; CTY—Washington; RR—P. R. R.
PR—I. W. Semans......Uniontown, Pa.
TR—E. T. Semans, " "
S of H—Mules and rope.
Coke Ovens, 257 Bee Hive.
Formerly owned by the Bessemer Coke Co.
Not operating June 30, 1916.

THOMAS, IVOR, COAL CO.
Delphin Mine; Drift; "B" Seam; 33 in. thick.
PO—Boswell, Pa.; SP—Same; CTY—Somerset; RR—B. & O., Quemahoning Br.
PR—Ivor Thomas.........Boswell, Pa.
GM—Ivor Thomas, " "
PA—Ivor Thomas, " "
MS—Mike Harding, " "
EM—Chas. Hurd, " "
S of H—Mules.
S of M—Hand.
EMP—9. 5-25-15. Started shipping coal Sept., 1914.

THOMPSON-CONNELLSVILLE COKE CO
Thompson No. 1 and 2, Shafts; Pgh. Seam, 6 to 9 ft. thick.
PO—New Salem, Pa. SP—Republic, Pa. CTY—Fayette. RR—P. R. R, Monon. Div.
PR—J. P. Brennan, .. Pittsburgh, Pa.
GM—J. P. Brennan, " "
PA—W. G. Rock " " "
TR—A. A. Thompson, New Salem, Pa.
GS—A. A. Thompson, " " "
MS—John Harding, Republic, Pa.
CE—J. M. Rayburn, Pittsburg, Pa.
MM—Harry Murray, New Salem. Pa.
SCO—Lilly Run Supply Co. Buyer, E. K. Seeman, Republic, Pa.
S of H—10 comp. air loco. Track gauge 42 in.
S of M—Hand and comp. air.
PP—18 Return tubular Erie & Penna. boilers, total 2,700 H.P. 4 gen. units 250 volts D.C., 3 air compressors and 1 pump.
EMP—No. 1, 330; 2, 208. Coke ovens, 800 Bee Hive. Last fiscal year output. No. 1, 435,002; No. 2, 259,790 tons.
Sales Agency, Producers Supply Co., Uniontown, Pa.

THROPP, JOSEPH E.
General Office, Everett, Pa.
GM—D. S. Thropp.........Everett, Pa.
PA—D. S. Thropp, " "
GS—G. W. Hughes, " "
MM—Chas. Felton, " "
EE—Chas. Felton, " "
EM—P. E. Womelsdorf, Philipsburg, Pa.
SCO—Kearney Supply Co., Kearney, Pa.; Minersville Supply Co., Minersville, Pa.; Earlston Supply Store, Everett, Pa.

Kearney Barnett and Kearney Slope and Plane Mines; Seam 24 to 60 in. thick.
PO—Kearney, Pa.; SP—Same; CTY—Bedford; RR—H. & B. T.
MS—R. H. Kay...........Saxton, Pa.
S of H—Mules, rope, gravity, comp. air and steam loco.; track gauge 36 in.
S of M—Hand and electric shortwall mach.
PP—3 Erie City return tubular boilers, total 350 H. P., 1 air comp. and 2 pumps.
EMP—130. Coke ovens, 170 Bee Hive. Last fiscal year output 40,000 tons.

Gordon Mine; Slope and Drift; Seam 30 to 60 in. thick.
PO—Dudley, Pa.; SP—Same; CTY—Same; RR—H. & B. T.
MS—R. H. Kay...........Saxton, Pa.
S of H—Mules, rope, gravity, comp. air, elec. and steam loco.
S of M—Hand and electric shortwall machines.
PP—2 Return tubular boilers, 1 gen. unit, 250 volts, D. C.; Elec. and steam pumps.
EMP—200. Coke ovens, 900 Bee Hive. Last fiscal year output 130,000 tons.

TROUT RUN COAL MINING CO.
General Office, St. Benedict, Pa.
Trout Run No. 5 Mine; Slope; E of Upper Freeport Seam; 36 to 50 in. thick.
PO -Portage, Pa.; SP—Same; CTY—Cambria; RR—Penna., Martins br.
PR—Rembrandt Peale,
Grand Central Terminal, New York, N. Y.
TR—Wm. B. Oaks,
Grand Central Terminal, New York, N. Y.
GS—Richard Peale....St. Benedict, Pa.
PA—G. E. Metzger, " "
EM—Meritt Hutton, " "
MS—J. W. Haddick.......Portage, Pa.
EE—E. K. Davis.........Spangler, Pa.
SCO—Portage Trading Co., Portage, Pa. Buyer, W. H. Harvey, St. Benedict, Pa.
S of H—Rope and 2 elec. locos. Track gauge 36 in.
S of M—5 elec. mach.
PP—1 Phoenix return tubular boiler, total 125 H. P., one 200 K. W. gen. unit, 250 volts D. C., 2 pumps. Purchase power.
EMP—80. Last fiscal year output 64,960 tons.

TIDE COAL MINING CO.
Tide Nos. 1 and 2 Mines; Drift; "B" Seam, 45 in. thick.
PO—Lucerne Mines, Pa.; SP—Tidedale, Pa.; CTY—Indiana; RR—B. R. & P.
PR—J. M. Guthrie, ...Indiana, Pa.
PA—H. C. Smith....Punxsutawney, Pa.
TR—F. H. Beck,....Punxsutawney, Pa.
Chief Eng—G. W. Bymer...Indiana, Pa.

GM—Lucius W. Robinson, Jr., Indiana, Pa.
MS—W. S. Blyth, ...Homer City, Pa.
EE—L. W. Householder, Punxsutawney, Pa.
SCO—Mahoning Supply Co. Buyer, D. H. McIntyre, Punxsutawney, Pa.
S of H—3 Elec. loco.; track gauge 42 in.
S of M—5 elec. mach.
PP—1 Pump; power purchaased.
EMP—172.
Sales Agency, R. P. Coal & Iron Co., Rochester, N.Y.

TIMBLIN COAL CO.

Timblin Mine; Drift; Freeport Seam, 41 to 55 in. thick.
PO—Knoxdale, Pa.; SP—Timblin, Pa.; CTY—Jefferson; RR—P. & S.
PR—Joseph Knabb.......Knoxdale, Pa.
TR—Jacob Hopkins, " "
CE—Hess & Bouton......Du Bois, Pa.
S of H—Mules.
S of M—Hand.
PP—1 boiler, 10 H. P., 1 pump.
EMP—8. Last fiscal year output 3000 tons.

TOBY COAL MINING CO.

Groves Mine; Drift; 40 to 48 in. thick.
PO—Brockwayville, Pa.; SP—Dellwood; CTY—Jefferson.
PR—D. D. Groves.....Brockwayville, Pa.
TR—D. D. Groves, " "
GM—D. D. Groves, " "
PA—W. M. August, " "
GS—W. M. August " "
EM—W. M. August, " "
MM—Wm. Shaffer, " "
MS—Wm. Harris, " "
S of H—Mules. Track gauge [illegible] ft.
S of M—6 Comp. air mach. and hand.
PP—1 Return tubular boiler, 125 H. P., 1 comp. and 3 pumps.
EMP—50. Last fiscal year output 62,000 tons.
Sales Agent, W. M. August, Brockwayville, Pa.

TOWER HILL CONNELLSVILLE COKE CO.

General Office, Uniontown, Pa.
Receivers G. S. Harah, L. W. Fogg, and J. R. Thompson, Uniontown, Pa.
MS—F. A. Coffroth.....Uniontown, Pa.
PA—L. W. Fogg, " "
SCO—Tower Hill Supply Co. Buyer, John Foltz, Republic, Pa.
Sales Agent, Producers Coal Co., Uniontown, Pa.

Tower Hill No. 1, Shaft, Pittsburgh Seam, 84 to 108 in. thick.
PO—Republic, Pa., SP—Same, CTY—Fayette. RR—Monon RR.
S of H—Mules and 4 comp. air loco. Track gauge 44 in.
S of M—Hand and 13 comp. air mach.
PP—3 Return tubular boilers, total 1212 H.P., 2 engines, 220 volts D.C., 2 air compressors and 1 pump.
EMP—372. Coke ovens, 112 Bee Hive and 208 rectangular.

Tower Hill No. 2, Shaft, Pittsburgh Seam, 84 to 108 in. thick.
PO—Republic, Pa.; SP—Same; CTY—Fayette; RR—Monon. R. R.
S of H—Mules and 3 comp. air loco. Track gauge 44 in.
S of M—Hand and 15 comp. air mach.
PP—3 Return tubular boilers, total 1212 H.P., 2 engines, 220 volts D.C., 2 air comp. and 1 pump.
EMP—359. Coke ovens, 140 Bee Hive and 254 Rectangular.

TUB MILL COAL CO.

Tub Mill Mine; Drift; Pgh. Seam, 84 to 108 in. thick.
PO—West Salisbury, Pa.; SP—Same; CTY—Somerset; RR—B. & O., Salisbury Branch.
PR—H. F. Knecht, W. Salisbury, Pa.
TR—L. L. Beachy, " " "
GM—John A. Knecht, " " "
PA—John A. Knecht, " " "
MS—John A. Knecht, " " "
S of H—Mules; track gauge 42 in.
S of M—Hand.
EMP—14. Last fiscal year output 12,500 tons.

TUNNEL COALING CO.

General Office, Greensburg, Pa.
PR—Julian B. Huff......Greensburg, Pa.
TR—A. N. Pershing, " "
GM—A. N. Pershing, " "
PA—A. N. Pershing, " "
CE—Robert Morris, " "
EM—Robert Morris, " "
GS—M. J. Bracken......Gallitzin, Pa.
EE—J. B. Morrill, " "
SCO—Tunnel Supply Co., Buyer, J. Clyde Wetson, Gallitzin, Pa.
Total production last fiscal year 728,088.50 net tons.

Tunnel No. 1 Mine; Drift; "E" Seam; 48 in. thick.
PO—Gallitzin, Pa.; SP—Same; CTY—Cambria; RR—Penna.
MS—M. J. Bracken......Gallitzin, Pa.
S of H—Mules, rope, 2 Elec. and 1 steam loco.
S of M Hand and 6 Elec. mach.
PP—4 Return tubular boilers and 2 gen. units.
EMP—247.

Cardiff Mine; Drift; Miller Seam; 42 to 48 in. thick.
PO—Nettleton, Pa.; SP—Nanty Glo, Pa.; CTY—Cambria RR—Penna., Black Lick Div.
MS—James Walker.......Nettleton, Pa.
SCO—Tunnel Supply Co. No. 2 Store.
S of H—4 elec. loco. Track gauge 36 in.
S of M—11 elec. mach.
PP—3 return tubular boilers, 2 gen. units, 250 volts D. C.
EMP—300. Last fiscal year output 175,000 tons.

Greenwich Nos. 2 and 3 Mines; Drift and Slope; Lower Freeport Seam; 46 in. thick.
PO—Saxman, Pa.; SP—Garman, Pa.; CTY—Cambria; RR—Penna., Cresson Div.
MS—Ernest Northover......Saxman, Pa.
SCO—Tunnel Supply Co. Buyer, J. I. Boucher, Spangler, Pa.
S of H—Rope and 5 Elec. loco.
S of M—9 elec. and 7 comp. air mach.
PP—6 return tubular boilers.
EMP—300. Last fiscal year output 248,878 tons.

Greenwich Nos. 5 and 8 Mines; Drift and Slope; "B" Seam; 36 in. thick.
PO—Starford, Pa.; SP—Shanktown, Pa.; CTY—Indiana; RR—Penna., Cresson Div., Cherry Tree & Dixonville R. R.
MS—Wm. Reed..........Starford, Pa.
S of H—4 Elec. loco.
EMP—252.

TYRONE COAL COMPANY

Tip Top Mine; Drift; Pittsburg Coking Coal Seam; 108 in. thick.
PO—Connellsville, Pa.; SP—Twistman, Pa.; CTY—Fayette; RR—B. & O.
PR—Logan Rush,.....Connellsville, Pa.
TR—W. E. Rice " "
S of H—Mules.
S of M—Hand.
Sales agent, W. E. Rice.
Note—This company have opened up the Tip Top mine, formerly operated by the H. C. Frick Coke Company.

TYRONE FUEL & SUPPLY COMPANY.

General Office, Tyrone, Pa.
Miller Bros. No. 1 Mine; Drift; "C" Seam; 28 to 36 in. thick.
PO—Mountaindale, Pa; SP—Same; CTY—Cambria; RR—Penn'a Bellwood Division.
GM—Nevin N. Miller, Tyrone, Pa.
S of H—Mules.
S of M—Hand.
EMP—20 to 25.
Note—Formerly Brown Bros. Coal Co.

UNION COAL & COKE COMPANY

General Office, 420 Wood St., Pgh., Pa.
PR—Wm. I. Berryman...Pittsburgh, Pa.
TR—John S. Irwin " "
GM—William Bird, " "
PA—E. W. Studer " "
CE—A. S. Pollock, " "
EM—A. S. Pollock, " "
GS—E. W. Miller.......Marianna, Pa.
MM—M. S. Christy " "
EE—J. K. Jones " "

Francis Mine; Slope; Pittsburgh No. 8 Seam; 60 in. thick.
PO—Burgettstown, Pa.; SP—Same; CTY—Washington; P. R. R., Panhandle Div.
MS—Robert Mauchline..Burgettstown, Pa.
S of H—Mules and 3 elec. locos. Thack gauge 42 in.
S of M—10 elec. mach.
PP—4 water tube boilers 800 total H. P., 2 gen. units, 300 D. C., 5 pumps, 2 air compressors.
EMP—150. Last fiscal year output 125,000 tons.

Rachel Mine; Shaft; Pittsburgh Vein, 72 in. thick. Operate washery.
PO—Marianna, Pa.; SP—Same; CTY—Washington; RR—P. R. R., M. & W. Branch.
MS—E. W. Miller.....Marianna, Pa.
S of H—1 elec. and 25 comp. air locos. Track gauge 48 in.
S of M—30 comp. air mach.
PP—7 water tube boilers, 3500 total H. P., 1 gen. unit, 300 D. C., 1 pump and 4 air compressors.
EMP—600. Last fiscal year output, 600,000 tons. Coke ovens, 160 Bee Hive.
Sales Mgr., E. W. Studer, Pitsburg, Pa.
Note—This company has taken over these mines formerly operated by Pittsburgh-Buffalo Coal Co.

UNION COLLIERIES CO.

General Office 2207 Oliver Bldg., Pittsburgh, Pa.
Union Collieries Co. Mine; Pittsburgh and Freeport Seams.
PR—W. A. Luce, Farmers Bank Bldg., Pittsburgh, Pa.
TR—E. M. Love, Oliver Bldg., Pittsburgh, Pa.
GM—W. R. Calverley, Oliver Bldg., Pittsburgh, Pa.
CE—S. A. Taylor, " "
S of H—Elec. loco.
Note—This company has just began development of its property.

UNION CONNELLSVILLE COKE CO.

General Office, Uniontown, Pa.

Kathrine Mine, Shaft.
PO—Brownsville, Pa., R.D. No. 20. SP—Simpson, Pa. CTY—Fayette. RR—Monon
GM—Wm. Allison, .. Uniontown, Pa.
PA—Wm. Allison, " "
SCO—Simpson Supply Co. Mgr. T. L. Wilkinson, R.D. No. 20, Brownsville, Pa.
S of H—Mules.
S of M—Hand.
PP—4 return tubular boilers, total 600 H. P., 1 pump.
EMP—105. Coke ovens, 140.
(Old information.)

UNITED COAL CO

General Office, First National Bank Bldg., Pittsburgh, Pa.
James D. O'Neil, Receiver.
Sam A. Gilmore, " "
Robert P. Watt, "
Wm. K. Johnson, "
GS—E. L. Morris........Pittsburgh, Pa.
PA—J. I. Boyd, " "
EM—H. M. Schmidt, " "
MM—Edw. Winning, " "
EE—Edw. Winning, " "
SCO—Penn Mercantile Co., Buyer, H. D. Bittner, Pittsburgh, Pa.

Ella Mine, Drift, Pgh. Seam, 6ft. thick.
PO—Sunnyside, Pa.; SP—Milesville, Pa.; CTY—Allegheny; RR—P. & L. E.
MS—Robt. MacFarlane, Sunnyside, Pa.
S of H—6 Elec. loco., mules and rope, track gauge 44 in.
S of M—15 Elec. mach.
PP—4 Return tubular boilers total 600 H. P., 3 gen. units, 250 volts D. C., 1 pump.
EMP—256. Last fiscal year output 366,957 tons.

Rich Hill Mine, Slope, Pgh. Seam 6 ft. thick.
PO—Meadowlands, Pa.; SP—Same; CTY Washington; RR—P.C.C.& St. L.
MS—Wm. Minford...Meadowlands, Pa
SM—J. J. Jones. "
S of H—5 elec. loco., mules and rope, track gauge 44 in.
S of M—25 elec. mach.
PP—2 Water tube and 3 return tubular boilers, total 650 H. P., 2 gen. units 250 D. C., 2 compressors, 2 pumps.
EMP—440. Last fiscal year output 470,369 tons.

Patterson Mine, Drift, Pgh. Seam 6 ft. thick.
PO—Elizabeth, Pa. SP—Wylie, Pa. CTY—Allegheny. RR—P. & L. E.
MS—Chas. McKay.......Elizabeth, Pa.
S of H—8 elec. loco., mules and rope. Track gauge 44 in.
S of M—15 elec. mach.
PP—4 Return tubular boilers, total 600 H. P., 2 gen. units 250 volts D. C., 3 pumps. Purchase power.
EMP—424. Last fiscal year output 189,714 tons.

UNITED FIRE BRICK CO.

General Office, Uniontown, Pa.
Ferguson Mine; Drift.
PO—Dunbar, Pa.; SP—Ferguson, Pa.; CTY—Fayette; RR— B.& O.
PR—T. B. Palmer....Uniontown, Pa.
TR—I. W. Semans, " "
GM—G. W. Greenwood, " "
PA—G. W. Greenwood, " "
GS—Paul Schmidt, " "
S of H—1 Elec. loco.
S of M—Hand.
PP—Purchase power.

UNITED STATE BUREAU OF MINES.

Experimental Mine; Pgh. Seam, 60 in. thick.
PO—Bruceton, Pa.; SP—Experiment, Pa; CTY—Allegheny; RR—B. & O.
Director—Van. H. Manning, Washington, D. C.
MS—H. C. Howarth......Bruceton, Pa.
EM—L. M. Jones......Pittsburgh, Pa.
PA—J. H. Robinson....Pittsburgh, Pa.
S of M—1 Comp. air mach.
PP—1 compressor, 2 loco. type boilers, total 140 H. P.
Mine is used for experimental purposes.

UNITY COAL CO.

General Office, Greensburg, Pa.
Carney Mine, Drift, Up Freeport Seam, 40 to 44 in. thick.
PO—R. F. D. No. 2 Latrobe, Pa.; SP—Donahoe, Pa.; CTY—Westmoreland; RR—P. R. R.
PR—J. B. Huff......Greensburg, Pa.
GM—A. N. Pershing, " "
PA—A. N. Pershing, " "
CE—Robt. Morris, " "
EM—Leo C. Gibson, " "
TR—Jos. E. Barnett......Latrobe, Pa.
S of H—3 Elec. loco., rope and mules; track gauge 36 in.
S of M—6 Elec. mach. and hand.
PP—4 Erie, return tubular boilers, total 500 H. P., 3 pumps.
EMP—150. Last fiscal year output 99,404 tons.

UNITY-CONNELLSVILLE COKE CO.

Elizabeth Mine, Slope, Pgh. Seam 5 to 9 ft. thick. operate washery.
PO—Latrobe, Pa.; SP—Same; CTY—Westmoreland. RR—P.R.R., Ligonier Valley Branch.
PR—J. A. Sheetz........Greensburg, Pa.
TR—W. D. Walthour..Greensburg, Pa.
GM—J. F. Irwin......Latrobe, Pa.
GS—J. F. Irwin, " "
PA—J. F. Irwin, " "
EM—J. F. Irwin, " "
MS—George Neish, " "
MM—Daniel Pearson, " "
S of H—Mules and rope; track gauge 42 in.
S of M—Hand.
PP—4 Erie return tubular boilers, total 400 H.P., 3 pumps, also purchase power.
EMP—100. Last fiscal year output 63,762 tons. Coke ovens, 100 Bee Hive.

UREY RIDGE COAL CO.

General Office, Philadelphia, Pa.
Urey Ridge Mine, Drift, C. Prime Seam, 3½ ft. to 5 ft. thick.
PO—Glen Campbell, Pa. SP—Same. CTY—Indiana. RR—P. R. R.
PR—G. B. Roberts.....Philadelphia, Pa.
TR—W. A. Smith, " "
PA—A. Y. Stevenson, " "
GM—A. M. Riddell........Altoona, Pa.
EM—A. B. Crichton......Johnstown, Pa.
MS—Jas. Bowers...Glen Campbell, Pa.
S of H—Mules. Track gauge 36 in.
S of M—Hand and 5 elec. mach.
PP—2 return tubular boilers, total 160 H. P.
EMP—125. Last fiscal year output 112,500 tons.
Sales Agent, David E. Williams & Co., Philadelphia, Pa.

VALLEY CAMP COAL CO.

General Office, Cleveland, O.
1 mine in Penna., 1 mine in Ohio.
Valley Camp Mine; Drift; Upper and Lower Freeport Seams, 6 ft. thick.
PO—New Kensington, Pa.; SP—Valley Camp, Pa. CTY—Westmoreland. RR—P.R.R.,B.&A.V. Div.
PR—J. A. Paisely......Cleveland, O.
GM—H. E. Kinlock.....Parnasus, Pa.
TR—W. W. Woods.......Cleveland, O.
PA—H. E. Kinloch, New Kensington, Pa.
GS—H. E. Kinloch, " "
MS—J. L. McVicker, New Kensington, Pa.
CE—Randolph & Means..Pittsburgh, Pa.
EM—Geo. Goodboy........Arnold, Pa.
EE—Jas. Gibbs, " "
S of H—5 Elec. loco.; track gauge 44 in.
S of M—5 Elec. mach.
PP—4 Return tubular boilers, total 600 H. P., 2 gen. units 250 volts D. C., 2 pumps. Purchase power.
EMP—315. Last fiscal year output 505,274 tons.

Bertha Mine; Drift; Pittsburgh Seam; 66 to 76 in. thick.
PO—Bruceton, Pa.; SP—Same; CTY—Allegheny; RR—B. & O., Wheeling Div.
S of H—Mules and 2 elec. locos. Track gauge 42 in.
S of M—11 elec. machines.
PP—3 pumps. Purchase power.
EMP—125.
Sales agent, J. A. Paisley, Cleveland, O.

VALLEY SMOKELESS COAL CO.

General Office, 1110-15 Penn Square Bldg., Philadelphia, Pa.
PR—John C. Dawson..Philadelphia, Pa.
TR—T. F. Bartholomew, " "
PA—T. F. Bartholomew, " "
GS—C. C. Dovey,.......Johnstown, Pa.
MS—C. E. Mitchell, " "
MM—James Walton, " "

Valley Smokeless No. 1 Mine; Drift; Upper Freeport Seam; 63 to 72 in. thick.
PO—Johnstown, Pa.; SP—Same; CTY—Cambria; RR—Penna. & B. & O.
S of H—6 elec. locos.
S of M—Hand and 7 elec. mach.
PP—2—250 K. W. gen. Units, 250 volts D. C., 3 phase, 60 cycle, 1 pump. Purchase power.
EMP—230 Last fiscal year output 215,543 tons.

Valley Smokeless No. 5 Mine; Drift; Upper Kittanning Seam; 38 to 42in. thick.
PO—Johnstown, Pa.; SP—Same; CTY—Cambria; RR—B. & O.
MS—W. E. Swartzentrover, Johnstown, Pa.
S of H—Mules.
EMP—15. Last fiscal year output 13,836 tons.

VERNER COAL & COKE CO.
General Office, Oliver Bldg., Pittsburgh, Pa.
PR—C. Ferguson......McDonald, Pa.
Asst. TR—H. B. Salkeld, Pittsburgh, Pa.
PA—H. B. Salkeld, " "
GM—Thomas Beading......Bulger, Pa.
EE—Wm. Clark, " "
SCO—Bulger Supply Co., Buyer Wm. Johnson, Bulger, Pa.
Sales Mgr., H. B. Salkeld, Pittsburgh, Pa.

Verner No. 1 Mine; Slope, Pgh. Seam, 60 to 77 in. thick.
PO—Bulger, Pa.; SP—Same; CTY—Washington; RR—P. C. C. & St. L.
S of H—Elec. loco. track gauge 42 in.
S of M—13 Elec. mach.
PP—5 Gen. units, 440 volts A. C., 2 phase, 60 cycles, 11 pumps. Power purchased.
EMP—350. Last fiscal year output 380,000 tons.

Cedar Grove No. 2 Mine; Slope, Pgh. Seam, 60 to 78 in. thick.
PO—Studa, Pa.; SP—Burgettstown, Pa.; CTY—Washington; RR—P. C. C. & St. L.
MS—Ed Miller............Studa, Pa.
S of H—Elec. and steam loco.; track gauge 44 in.
S of M—2 Elec. mach.
PP—4 water tube boilers, gen. unit 250 volts D. C., 3 pumps.
EMP—250. New mine just opening.

VESTA COAL CO.
General Office, J. & L. Bldg., Pittsburgh, Pa.
PR—B. F. Jones, Jr.....Pittsburgh, Pa.
TR—Chas. A. Fisher, " "
GM—Wm. Larimer Jones, " "
GS—H. B. N. Louttit...Pittsburgh, Pa.
PA—F. W. Ochsenhirt, Jr. " "
SCO—Pittsburgh Mercantile Co., Pittsburgh, Pa.

No. 1 Mine; Drift; Pittsburgh Seam, 68 to 78 in. thick.
PO—California, Pa.; SP— Allenport, Pa.; CTY—Washington; RR—P. R. R., Monon. Div.
MS—W. R. Musser......California, Pa.
S of H—Mules.
S of M—Hand.
EMP—24. Last fiscal year output 28,633 tons.

No. 3 Mine; Drift; Pittsburgh Seam, 48 to 90 in. thick.
PO—California, Pa.; SP—Coal Center, Pa.; CTY—Washington RR—P. R. R. Monon Div.
MS—W. R. Musser......California, Pa.
S of H—2 Elec. loco. and mules.
S of M—Hand.
PP—Purchase power.
EMP—254. Last fiscal year output 199,528 tons.

No. 4 Mine: Drift; Pittsburgh Seam, RR—P. R. R., Monon. Div.
PO—California, Pa.; SP—Same; CTY—Washington; RR—P. R. R., Monon. Div.
MS—Robert Barr........California, Pa.
S of H—36 Elec. loco. and rope; track gauge 48 in.
S of M—32 Elec. mach.
PP—18 boilers, total 3,345 H. P., 3 gen. units 500 volts A. C., 19 pumps.
EMP—1,484. Last fiscal year output 1,700,779 tons.
No. 5 Mine; Drift; Pittsburgh Seam, 57 to 93 in. thick.
PO—California, Pa.; SP—Centerville, Pa.; CTY—Washington; RR—P. R. R., Monon. Div.
MS—Peter Neil......Frederickstown, Pa.
S of H—Rope and 15 Comp. air loco.; track gauge 48 in.
S of M—15 Elec. and 18 Comp. air mach.
PP—8 Return tubular boilers, total 2400 H. P., 7 compressors and 1 pump.
EMP—856. Last fiscal year output 747,550 tons.

No. 6 Mine.
PO—California, Pa.; SP—Denbo, Pa.

VETERAN COKE CO.
General Office, Greensburg, Pa.
Veteran Mine, Drift; Connellsville Seam 9 ft. thick.
PO—Mt. Pleasant, Pa.; SP—Udell Station, Pa.; CTY—Westmoreland; RR—P.R.R., South West Br.
PR—J. A. Strickler, Wilkinsburg, Pa.
TR—J. V. Kuhns.........Greensburg, Pa.
GM—J. C. Kline, " "
GS—C. J. Kline, " "
PA—C. J. Kline, "
MS—M. E. Strickler, Mt. Pleasant, Pa.
SCO—Mt. Pleasant Supply Co., Buyer, G. E. Nicely, Greensburg, Pa.
S of H—1 Steam loco. and rope track gauge 44 in.
S of M—Hand.
PP—Power puchased, 2 pumps.
EMP—75. Coke ovens, 80 Bee Hive. Last fiscal year output 182,430 tons.

VICTOR COAL MINING CO.
General Office, Somerset, Pa.
Haws Nos. 1, 2, and 3 Mines; Shaft and Slopes; Upper and Lower Kittanning Seams, 36 to 48 in. thick.
PO—Hollsopple, Pa.; SP—Same; CTY—Somerset. RR—B. & O., Somerset & Cambria Branch.
PR—Joel H. DeVictor, West End Trust Bldg., Philadelphia, Pa.
TR—Thos. R. Patton, 1713 Sansom St. Philadelphia, Pa.
GM—Lloyd G. McCrum, Somerset, Pa.
PA—Lloyd G. McCrum, " "
MM—Harvey Brallier....Holsopple, Pa.
EM—S. E. Dickey & Co. Johnstown, Pa.
SCO—Holsopple Supply Co. Buyer C. J. Lehman, Holsopple, Pa.
MS—J. W. Pletcher, ..Holsopple, Pa.
S of H—Mules and rope.
S of M—Hand and 19 Comp. air mach.
PP—4 Water tube boilers, total 600 H. P., 2 compressors, 14 pumps.
Last fiscal year output 129,920 tons.
Sales Agent, W. H. Bradford & Co., Inc., New York City and Philadelphit, Pa.

VICTORIA COAL CO.
General Office, Oliver Bldg., Pittsburgh, Pa.
Victoria No. 1 Mine, Drift, up. Freeport Seam, 48 to 60 in thick.
PO—Queen Junction, Pa.; SP—Same; CTY—Butler; RR—B. & L. E., Main Line.
PR—Chas. S. Bygate....Pittsburgh, Pa.
TR—Fred Stover, " "
GM—Fred Stover, " "
PA—Fred Stover, " "
MS—John Mathieson, Queen Junction, Pa.
SCO—Imperial Supply Co., " "
S of H—Mules.
S of M—2 Elec., 2 comp. air mach.
PP—2 Return tubular boilers, total 200 H. P., gen. unit 250 volts D. C., 2 compressors, 1 pump.
EMP—50. Last fiscal year output 60,000 tons.
Sales Agency, Theiss, Bygate Co., Pittsburgh, Pa.

VICTORIA COAL MINING CO.
General Office, 11 Broadway, New York.
PR—C. J. Wittenberg......New York.
TR—E. J. Macnamara, " "
GS—S. B. Wittenberg. Phillipsburg, Pa.
EM—Womelsdorff & Dunkle, " "
PA—John W. Ball....Morrisdale, Pa.
EE—Sam. E. Fowler, " "
SCO—Pennsylvania Mercantile Co., Ltd., Buyer, Ephriam Goldthorp, Philipsburg, Pa.
Sales Agent, C. J. Wittenberg, 11 Broadway, New York.

Acme Colliery No. 2, Slope, "B" Vein, 40 to 48 in. thick.
PO—Hawk Run, Pa. SP—Same, CTY—Clearfield. RR—N.Y.C. & H.R.R., Beech-Creek District.
MS—Fred Mears, Hawk Run, Pa.
S of H—Mules, rope and elec. loco. track gauge 35 in.
S of M—Pick.
PP—4 Lebanon cylindrical boilers, and 1 Erie return tubular boiler, total 365 H.P. 6 pumps, also buy power.
EMP—90. Last fiscal year output 61,960 tons.

Acme Colliery No. 6, Drift, "B" Vein, 44 in. thick.
PO—Hawk Run, Pa., SP—Same, CTY—Clearfield RR—N.Y.C. & H.R.R., Penna. Div.—Beech Creek District
S of H—Mules, and 2 elec. loco., track gauge 35 in.
S of M—Pick and 2 elec. machines.
PP—1 pump. Buy power.
EMP—75. Last fiscal year output 50,156 tons.

VINTON COLLIERY CO.
General Office, No. 1 Broadway, New York, N. Y.
Vinton Nos. 1, 2, 4, 5, and 6 Mines; Drifts and Slopes; "B" Seam, 42 in. thick.
PO—Vintondale, Pa.; SP—Same; CTY—Cambria; RR—P. R. R., and B. R. & P.
Chairman Ex. Com.—Warren Delano. New York, N. Y.
PR—C. M. Schwerin, " "
GM—C. M. Schwerin, " "
TR—A. T. Burr, " "
PA—George S. Blewitt, Vintondale, Pa.
Chief Eng—J. J. Huth..Vintondale, Pa.
MS—Otto Hoffman, " "
EM—Ray J. Thorn.....Vintondale, Pa.
MM—John Roberts, " "
EE—C. G. Shaffer, " "
S of H—2 Steam, 16 Elec. loco., and rope; track gauge 36 in.
S of M—24 Elec. mach.
PP—4 Sterling water tube boilers, total 2000 H. P. Power from Central station.
EMP—900. Coke ovens, 152 Bee Hive. Last fiscal year output 815,000 tons.
Sales Agent, address the New York office.

VIVIAN COAL CO.
See H. B. Swoope & Co.

VOGELEY COAL CO.
Vogeley Mine, Drift, Up. Freeport Seam 40 to 42 in. thick.
PO—Butler, Pa.; SP—Same; CTY—Butler. RR—P.R.R.
GM—Theo. Vogeley.......Butler, Pa
GS—Theo. Vogeley, " "
PA—Theo. Vogeley, " "
MS—Harry Gould, 204 McClain Ave., Butler, Pa.
S of H—1 Elec. loco.; track gauge 30 in.
S of M—2 elec. mach.
PP—1 gen. unit, 250 volts D. C. Buy power. 1 pump.
EMP—42. Last fiscal year output 37,000 tons.

VULCAN COAL MINING COMPANY
General Office, Franklin Bank Bldg., Phila., Pa.
Olanta Mine; Drift; "B" Seam; 30 to 48 ins. thick.
PO—Olanta, Pa.; SP—Same; CTY—Clearfield, RR—New York Central.
PR—M. D. Kelley.....Snow Shoe, Pa.
TR Geo. F. Snyder ......Phila., Pa.
S of H—Mules.
S of M—Hand.
Sales Mgr., E. M. Saunders, Franklin Bank Bldg., Phila., Pa.

WALKER, E. J. & CO.
Stanley No. 2 and Troy Nos. 1 and 2; Slope and Drift; 3½ to 5 ft. thick.
PO—Brisbin, Pa.; SP—Houtzdale; CTY—Clearfield; RR—P.R.R. Amesville Branch.
GM—J. D. Walker......Brisbin, Pa.
MS—J. D. Walker, " "
EM—S. M. Herriett, " "
EE—Willard Walker, " "
SM—E. J. Walker, " "
S of H—Mules and steam loco.; track gauge 36 in.
S of M—Hand.
PP—Power purchased, gen. units 220 volts A. C., 3 phase, 60 cycles, 3 elec. pumps. Buy power.
(Old information.)

WALTERSBURG COKE CO.
General Office, Uniontown, Pa.
Edna Mine, Slope, Pgh. Seam 6 to 9 ft. thick.
PO—Waltersburg, Pa.; SP—Same; CTY—Fayette. RR—P.R.R., P.V. & C. Branch.
PR—W. A. Stone....Uniontown, Pa.
GM—W. A. Stone, " "
PA—W. A. Stone, " "
TR—W. C. Black, " "
MS—O. P. Stone....Waltersburg, Pa.
CE—Fayette Engineering Co., Uniontown, Pa.
SCO—Waltersburg Supply Co.; Buyer Harry E. Henshaw, Waltersburg, Pa.
S of H—Rope and 3 Elec. loco.; track gauge 42 in.
S of M—Hand.
PP—2 Return tubular boilers, total 100 H. P. Purchase power.
EMP—150. Coke ovens, 150 Bee Hive. Last fiscal year output 70,000 tons.
Sales Agent, W. A. Stone & Co., Uniontown, Pa.

WARNER LEONARD COAL CO.
General Office, 811 Leader Bldg., Cleveland, Ohio.
Kinder Mine, Slope, Pittsburgh Seam, 7 ft. thick.
PO—West Brownsville, Pa., SP— Same, CTY—Washington. RR—Penna., P.V. & C. Branch.
GM—W. H. Warner....Cleveland, O.
PA—K. B. Whitworth, " "
EM—E. L. Thrower, " "
MS—John E. Leonard, W. Brownsville, Pa.
S of H—Mules and rope; track gauge 44 in.
S of M—4 Elec. machines.
PP—2 Return tubular boilers, total 200 H. P., 1 gen. unit 250 volts D. C. 2 pumps.
EMP—75. Last fiscal year output 127,975 tons.
Sales Agents, W. H. Warner & Co., Cleveland, Ohio.

WARNER YOUGHIOGHENY COAL CO.
General Office, 811 Leader Building. Cleveland, Ohio.
Leonard Mine, Drift, Pittsburgh Seam, 8 ft thick.
PO—Fayette City, Pa. SP—Fayette City, Pa, and Landon, Pa. CTY—Fayette; RR—P. & L. E.
CM—W. H. Warner, Cleveland, Ohio.
EM—E. L. Thrower, " "
PA—K. B. Whitworth, " "
MS—John E. Leonard..Fayette City, Pa.
S of H—4 Elec. loco. Track gauge 44 in.
S of M—7 Elec. machines.
PP—Buy power. 3 pumps.
EMP—236. Last fiscal year output 299,600 tons. Sales Agent, W. H. Warner & Co., Cleveland, Ohio.

WARRICK, G. W.
General office, Normalville, Pa.
Warrick Mine; Drift; Uupper Freeport Seam 42 to 48 in. thick.
PO—Normalville, Pa; SP—Miller's Crossing; RR—I. C. W. CTY—Fayette.
PR—G. W. Warrick....Normalville, Pa.
GM—G. W. Warrick, " "
PA—G. W. Warrick, " "
S of H—Rope and 1 steam loco.
S of M—Hand.
PP—1 pump.
EMP—9.
Note—Successor to Clark S. Miller.

WASHINGTON COAL & COKE CO.
General Office, ... Dawson, Pa.
PR—M. M. Cochran, " "
TR—J. H. Price, " "
EM—Thos. M. Zimmerman, "
GM—H. M. McDonald..Star Juncion, Pa.
PA—D. M. Graham, Star Junction, Pa.
GS—R. M. Pollock, " "
SCO—Star Supply Co., Ltd. Buyer, J. B. Knox, Star Junction, Pa.

Sales agent, N. P. Hyndman, 2211 First Nat. Bk. Bld'g. Pgh.
Washington No. 1 Shaft, Pittsburgh Seam, 6½ to 9½ ft. thick.
PO—Star Junction, Pa. SP—Same. CTY—Fayette. RR — Washington Run R. R., B. & O. and P. & L. E.
MS—R. M. Pollock, Star Junction, Pa.
S of H—Horses, rope and 6 elec. and 3 steam locos. Track gauge 44 in.
S of M—Hand, 3 elec. and 15 comp. air mach.
PP—4 Water tube and 7 return tubular boilers, total, 2,000 H.P. 4 Gen. units, 2,300 volts, A. C., 3-phase, 60-cycle, and 550 volts, D.C. 3 Air Compressors and 4 pumps.
EMP—500. Last fiscal year output, 750,000 tons. 500 Bee Hive coke ovens. 150 coke workers.

Washington No. 2 Slope, Pittsburgh Seam, 6½ to 9 ft. thick.
PO—Star Junction, Pa. SP—Same. CTY—Fayette. RR—Washington Run, B. & O. and P. & L. E.
S of H—Horses, rope, 6 elec. loco. and 1 steam loco. Track gauge 44 in.
S of M—Hand and 12 compressed air machines.
PP—12 Return tubular boilers, total 1700 H.P. 1 Gen. unit 550 volts D.C. 2 Air compressors and 5 pumps.
EMP—500. Last fiscal year output, 450,000 tons. 500 Bee Hive coke ovens. 150 coke workers.

Washington No. 3, Slope, Pittsburgh Seam 76 to 84 in. thick.
PO—Perryopolis, Pa. SP—Same. CTY Fayette, RR—P. & L. E.
MS—Fred Baker, Perryopolis, Pa.
S of H—Horses and rope; 1 elec. loco. Track gauge 42 inches.
S of M—Pick and 1 elec. mach.
PP—5 Return tubular boilers, total 625 H.P., 1 Gen. unit, 250 volts D. C., 2 pumps.
EMP—69. Last fiscal year output 50,000 tons.

WASHINGTON, CONNELLSVILLE COAL CO.
Coon Island, near Claysville, Pa.
No report.

WATKINS COAL CO.
General Office, 17 Battery Place, N.Y.
Watkins Mines Nos. 1 and 2; Drifts; U. and L. Freeport Seams; 3 ft. 6 in. to 4 ft. 8 in. thick.
PO—Barnesboro, Pa.; SP—Same; CTY—Cambria; RR—P. R. R., Walnut Run Br.
Watkins No. 3 Mine; Drift; Miller or B Vein.
PO—Barnesboro, Pa.; SP—Bakerton, Pa.; CTY—Cambria; RR—P. R. R., Susquehanna extension.
PR—C. L. Watkins......N. Y. City
TR—J. C. Thornton, " "
GM—C. L. Watkins, " "
PA—J. G. Nicholson, Barnesboro, Pa.
MF—Wm. Easton, Frank Nicholson, and George Nicholson, Barnesboro, Pa.
MM—Harvey Pfeffer, " "
CE—C. E. Schlicher...Spangler, Pa.
EM—C. E. Schlicher, " "
S of H—5 Elec. loco.; track gauge 36 in.
S of M—Hand, 5 Elec. and 11 comp. air mach.
PP—4 Return tubular boilers, total 460 H. P. 1 gen. unit, 250 volts D. C., 2 compressors.
EMP—300. Last fiscal year output 204,407 tons.

WATKINS COAL MINING COMPANY
See Watkins Coal Co.

WAVERLY COAL & COKE CO.
General Office, 2212 Oliver Bldg., Pgh., Pa.
Waverly Mine, Drift, Pgh. Seam, 64 in. thick.
PO—Virginville, W. Va. SP—Penowa, Pa.; CTY—Washington; RR—Wabash.
PR—E. M. Love, .. Pittsburgh, Pa.
TR—S. C. Cook......Washington, Pa.
PA—F. C. Bortz, " "
GM—R. M. Cook.......Washington, Pa.
MS—James McGuire....Virginville, W.Va.
CE—J. J. Roby, ... Cleveland, O.
EM—M. P. Clark .....Russelton, Pa.
MM—J. M. Collier, " "
EE—Louis Headington, Virginville, W.Va.
S of H—Mules and 2 Elec. loco.; track gauge 42 in.
S of M—4 Elec. mach.
PP—3 Erie City return tubular boilers, total 450 H. P., 6 pumps.
EMP—165. Last fiscal year output, 100,000 tons. Sales Agent, F. S. Love, Pittsburgh, Pa.

WELLER COAL CO.
Slope Mine; Cement Seam; 32 to 36 in. thick.
PO—Johnstown, Pa.; SP—Same; CTY—Cambria; RR—P. R .R.
PR—L. M. Weller.......Johntsown, Pa.
TR—L. M. Weller, " "
GM—C. C. Cupp, " "
MS—Albert Machine, " "
SCO—Cupp Grocery Co., " "
S of H—Rope.

WEINMAN BROTHERS.
Weinman's Mine, Drift; "Pittsburgh" Seam; 6 ft. thick.
..**PO**—Wilkinsburg, Pa. SP—Same, CTY—Allegheny. RR—P. R. R.
GM—J. Weinman,. Wilkinsburg, Pa.
MS—J. Weinman, " "
PA—J. Weinman, " "
S of H—Mules. Track gauge 40 in.
S of M—Hand.
EMP— 3 to 15.

WENTZ SMOKELESS COAL CO.
Pretoria Nos. 1, 2, and 3 Mines; Drifts and Slope; "C" Prime and "B" Miller Seams, 42 to 48 in. thick.
PO—Hollsopple, Pa.; SP—Same; CTY—Somerset; RR—B. & O.
TR—R. J. Wentz........Hollsopple, Pa.
GM—R. J. Wentz, " "
PA—R. J. Wentz, " "
MM—C. L. Castler, " "
EE—C. L. Castler, " "
CE—C. E. Dickey........Johnstown, Pa.
S of H—Rope and 3 elec. loco. Track gauge 36 in.
S of M—4 elec. and 2 comp. air mach.
PP—2 Return tubular boilers, 200 H. P., 1 pump.
EMP 50. Last fiscal year output 39,000 tons.
Sales Agent, R. J., Wentz, Hollsopple, Pa.

WEST LEECHBURG STEEL CO.
General Office, Farmers Bank Bldg., Pittsburgh, Pa.
West Leechburg Mine.
PO—Leechburg, Pa.; CTY—Armstrong;
PR—James Lippincott.
VICE PR—J. L. Kirkpatrick.
TR—D. M. Campbell.
Maintain a small mine for our own use and do not sell any of the output.

WESTMORE COAL & COKE CO.
Westmore Mine. CTY—Westmoreland.
GS—C. C. Baldwin....Forbes Road, Pa.
MS—Thomas McCartney,
New Alexandria, Pa.
No report.

WEST PENN COAL MINING CO.
General Office, Bullitt Bldg., Philadelphia, Pa.
West Penn No. 1 Mine; Drift; L. Kittanning Seam, 36 to 48 in. thick.
PO—Apollo, Pa. SP—Same; CTY—Armstrong. RR—P. R. R., Apollo Branch.
PR—Herman Haupt, Philadelphia, Pa.
TR—W. M. Haupt... Versailles, Ky.
Asst TR—Edw. I. Haupt....Apollo, Pa.
PA—Edw. I. Haupt, " "
MS—Edw. I. Haupt, " "
CE—Albert Smith, ...Saltsburg, Pa.
S of H—3 Elec. loco. Track gauge 36 in.
S of M—5 elec. mach.
PP—Power purchased.
EMP—250 to 300. Output per day, 700 to 800 tons. Sales Office, Philadelphia, Pa.

WEST PENN COKE CO.
Pittsburgh, Pa. No report.

WEST PENN MINING CO.
West Penn Mine, Drift.
PO—Leechburg, Pa. SP—Same. CTY—Westmoreland. RR—P. R. R., Conemaugh Div.
GM—L. W. Hicks........Leechburg, Pa.
PA—L. W. Hicks, " "
MS—Wm. Gilson, " "
S of H—Mules.
S of M—Elec. mach.
EMP—50. Last fiscal year output 53,871 tons.

WESTERMAN-FILER CO.
General Office, Sharon, Pa.
Diamond No. 3 Mine, Slope; "Brookville" Seam, 4 ft. thick.
PO—Grove City, Pa.; SP—Same. CTY—Mercer. RR—B. & L. E.
PR—Frank P. Filer, .. Mercer, Pa.
GM—Frank P. Filer, " "
GS—Frank P. Filer, " "
TR—Harry J. Filer, .. Sharon, Pa.
PA—Harry J. Filer, " "
MS—Harry H. Filer.....Grove City, Pa.
S of H—Mules, 2 Steam loco. and rope; track gauge 37 in.
S of M—Hand.
PP—4 Return tubular boilers, total 435 H. P., 2 pumps.
EMP—157. Last sfical year output 105,364 tons.

WESTMORELAND COAL CO.
General Office, 224 South Third Street, Philadelphia, Pa.
PR—S. Pemberton Hutchinson,
Philadelphia, Pa.
VP—1st—H. C. Adams, " "
TR—Geo. McCall, " "
GS—A. P. Cameron, ... Irwin, Pa.
MM—C. K. Witmer, " "
EM—Geo. T. Lewis........Irwin, Pa.

Westmoreland Shaft Mine, Pgh. Seam, 5 ft. 4 in. to 6 ft. thick.
PO—Irwin, Pa. SP—Biddle Station, Pa. CTY—Westmoreland. RR—P. R. R.
MS—Thos. Whiteman.......Irwin, Pa.
S of H—4 Elec. loco., mules and rope; 1,680 H. P., 4 pumps.
PP—14 return tubular boilers, total 1,680 H. P.
EMP—399. Last fiscal year output 429,329 tons.

Criterion Mine, Shaft, Pgh. Seam, 5 ft. 4 in. to 6 ft. 4 in. thick.
PO—Rillton, Pa. SP—Same. CTY—Westmoreland. RR—P. R. R.
MS—F. P. McClain, ... Rillton, Pa.
S of H—3 elec. locos. and mules.
S of M—Elec. and comp. air mach.
PP—10 return tubular boilers, total 1,500 H. P., 2 compressors and 1 pump.
EMP—506. Last fiscal year output 581,012 tons.

Export Nos. 1 and 2 Mines, Drift, Pgh. Seam, 5 ft. 4 in to 6 ft. 2 in. thick.
PO—Export, Pa. SP—Same. CTY—Westmoreland. RR—P. R. R.
MS—J. S. McCallen, ... Export, Pa.
S of H—7 Elec. loco.
S of M—Elec. mach.
PP—8 return tubular boilers, total 1,200 H. P., and 4 pumps.
EMP—763. Last fiscal year output 862,909 tons.

Magee Mine, Slope, Pgh. Seam, 6½ to 7 ft. thick.
PO—Yukon, Pa. SP—Same. CTY—Westmoreland. RR—P. R. R.
MS—Fred Spork...........Yukon, Pa.
S of H—4 Elec. loco. and rope.
S of M—Elec. mach.
PP—3 Return tubular boilers, total 900 H. P., and 4 pumps.
EMP—546. Last fiscal year output 650,428 tons.

Southside Mine, Drift, Pgh. Seam.
PO—Irwin, Pa. SP—Same. CTY—Westmoreland. RR—P. R. R.
MS—Edward Jones, ... Irwin, Pa.
EMP—43. Last fiscal year output 17,653 tons.

WESTMORELAND-CONNELLSVILLE COAL & COKE CO.
General Office, J 14 Frick Bldg., Pittsburgh, Pa.
Fort Palmer No. 1 Mine, Drift, Pgh. Seam 6 to 8 ft. thick.
PO—Ligonier, Pa. SP—Fort Palmer Siding, Wilpin Sta., Pa. CTY—Westmoreland. RR—Ligonier Valley.
GM—O. G. Leichliter, Ligonier, Pa.
PA—O. G. Leichliter, " "
SCO—Fort Palmer Supply Co., Buyer, J. H. Fry, Ligonier, Pa.
S of H—2 Elec. loco. and mules. Track Gauge 42 in.
S of M—Hand.
PP—2 Atlas Return Tubular boilers, total 300 H.P. 2 Gen. units, 250 volts D.C.
EMP—170. Last fiscal year output 160,000 tons.

WEST POINT MARION COAL WORKS
Walnut Hill Mine; Drift; Pittsburgh Seam, 60 to 96 in. thick.
PO—Point Marion, Pa.; SP—West Point Marion, Pa.; CTY—Fayette; RR—Monongahela.
PR—Asa M. Stirling, Point Marion, Pa.
TR—John B. Moore, " "
PA—John B. Moore, " "
GM—John B. Moore, " "
MS—A. H. Shotts.......Dilliner, Pa.
EM—Fayette Engineering Co.
Uniontown, Pa.
SCO—Walnut Hill Supply Co. Buyer, William Rhodes, Point Marion, Pa.
S of H—Mules and gravity.
S of M—Hand and 1 elec. machine.
PP—Gen. unit, 220 volts A. C., 2 phase, 60 cycles. Power purchased.
EMP—60. Last fiscal year output 35,000 tons.

WESTMORELAND GAS COAL COMPANY.
Hillside Mine; Drift; Pittsburgh Seam, 84 in. thick.
PO—Arona, Pa. SP—Madison, Pa. CTY—Westmoreland; RR—P. R. R., Hempfield Br.
PR—J. L. Kendall, Pittsburgh, Pa.
TR—J. H. Hillman, Jr., " "
GM—W. L. Alleicer, " "
MS—H. J. McArdle, ... Arona, Pa.
SCO—Miller Bothers.........Arona, Pa.
S of H—Mules. Coke ovens, 45 Bee Hive. Mine not operating.

WHARTON COAL & COKE COMPANY.
Wharton Mine, Slope; "E" or Upper Freeport Seam, 62 to 78 in. thick.
PO—Coral, Pa. SP—Same. CTY—Indiana. RR—Pennsylvania, Indiana Branch.
PR—Harrison S. Morris,.. Phila, Pa.
TR—Harrison S. Morris, " "
GM—J. Herbert Evans......Coral, Pa.
GS—J. Herbert Evans, " "
EM—J. Herbert Evans, " "
MS—John Hammond, " "
MM—Andrew Black, " "
EE—Andrew Black, " "
SCO—Coral Supply Co., Buyer, B. F. Harris, Coral, Pa.
S of H—Rope and mules. Track gauge 42 in.
S of M—Hand and 22 compressed Air Machines.
PP—2 Phoenix and 6 Erie City return tubular boilers, total 1000 H.P. 2 generating unit, 250 volts, D.C. 2 air compressors; 2 pumps.
EMP—78. Coke ovens, 300 Bee Hive. Last fiscal year output 73,539 tons.
Sales Agent Pilling & Crane, Philadelphia, Pa.

WHITE-DUGAN COAL CO.
Columbia No. 1 Mine; Slope; "B" Seam, 28 to 36 in. thick.
PO—Osceola Mills, Pa.; SP—Same; CTY—Clearfield; RR—P. & S.
PR—George R. Meek, Bellefonte, Pa.
TR—James F. Dugan, Osceola Mills, "
EM—H. S. Shillingford, " "
GM—F. K. White, .. Philipsburg, "
GS—F. K. White, " "
PA—F. K. White, " "
MS—Parick Mostyn, " "
S of H—Rope, run by electric hoist.
S of M—Hand.
PP—3 pumps.
EMP—25. Last fiscal year output 17,897 tons.

WHYEL COKE CO.
General Office, Uniontown, Pa.
PR—Harry Whyel, ..Uniontown, Pa.
GM—Harry Whyel, " "
TR—George Whyel, " "
PA—Harry Whyel, " "
CE—T. A. Douthitt, " "
SCO—Sewickley Supply Co., Buyer F. E. Weddell, Yukon, Pa.

Thomas Mine; Drift; Pittsburgh Seam, 96 in. thick.
PO—Smithfield, Pa.; SP—Smiley, Pa.; CTY—Fayette; RR—B. & O., S. & M. Br.
MS—F. Roby, R. F. S., Smithfield, Pa.
S of H—Mules. Track gauge 42 in.
S of M—Hand.
EMP—20. Coke ovens, 40 Bee Hive. Last fiscal year output, 30,000 tons.

Yukon Mine; Drift; Pittsburgh Seam, 84 to 108 in. thick. Operate Washery.
PO—Yukon, Pa. SP—Same. CTY—Westmoreland; RR—P. R. R., Yukon Br.
MS—J. A. Abraham, ... Yukon, Pa.
SM—Wm. McKeon, " "
S of H—Mules, rope and 4 Elec. loco.; track gauge 42 in.
S of M—6 Elec. mach.
PP—Purchase power. 2 pumps.
EMP—100. Coke ovens, 36 Bee Hive Last fiscal year output 180,000 tons.

Ellen No. 1 Mine; Slope; Pittsburgh Seam, 84 to 120 in. thick.
PO—Whitney, Pa.; SP—Same; CTY—Westmoreland; RR—P. R. R., Whitney Br.
MS—H. G. Turney........Whitney, Pa.
S of H—Horses; track gauge 42 in.
S of M—Hand.
PP—Purchase power.
Coke ovens, 40 Bee Hive.

Ellen No. 2; Drift: Pgh. Seam, 9 ft. thick.
..**PO**—Whitney, Pa. SP—Same. CTY—Wesmoreland; RR—P. R. R., Whitney Br.
MS—H. G. Turney........Whitney, Pa.
S of H—Horses; track gauge 42 in.
S of M—Hand.
PP—1 Erie return tubular boiler, 150 H.P.
Coke ovens, 50 Bee Hive.

WHYEL, JOHN A. & SON.
Snider Mine, Drift, Pittsburgh Seam, 8 to 9 ft. thick.
PO—Uniontown, Pa. SP—Same. CTY—Fayette.
PR—John A. Whyel, Uniontown, Pa.
TR—John A. Whyel, " "
MS—John A. Whyel, " "
S of H—Horses. Track gauge 30 in.
S of M—Hand.
EMP—9.

WIDNOON COAL MINING CO.
General Office, Reynoldsville, Pa.
Widnoon Mine (Armstrong County). Drift, Lower Kittannng Seam, 5½ to 4½ in thick.
PO—Lawsonham, Pa. SP— Same. CTY—Clarion. RR—A. V. Div. P. R. R.
PR—F. H. Beck, Reynoldsville, Pa.
TR—W. B. Alexander, " "
GM—J. S. Hammond, " "
PA—J. S. Hammond, " "
MS—F. M. Brown, " "
EM—S. L. Mortimer, Lawsonham, Pa.
MM—Reed Lawson, " "
SCO—Widnoon Supply Co. Buyer, R. B. Meredith, Lawsonham, Pa.
S of H—Rope and mules. Track gauge 42 in.
S of M—Hand and 8 comp. air machines.
PP—2 Return tubular boilers, total 300 H.P. 1 haulage engine, 1 air compressor.
EMP—150. Last fiscal year output, 108,000 tons. Sales agent, J. T. Roberts, Buffalo, N. Y.

WILBUR COAL MINING CO.
Wilbur Mine; Drift; "B" Seam, 54 to 66 in. thick.
PO—Hooversville, Pa.; SP—Same; CTY—Somerset; RR—B. & O.
PR—J. A. Campbell, Philadelphia, Pa.
TR—W. P. Graff, ...Blairsville, Pa.
GM—Telford Lewis, ..Hoovesville, Pa.
GS—Telford Lewis, " "
PA—Telford Lewis, " "
MS—S. B. Jones, " "
EM—R. P. Suppes, " "
MM—W. E. Neveling, " "
EE—W. E. Neveling, " "
SCO—Hooversville Supply Co.,
Hooversville, Po.
S of H—1 Elec. loco.; track gauge 36 in.
S of M—Hand.
PP—Power purchased.
EMP—90. Output 400 tons daily

Knickerbocker No. 5 Mine; Drift; "B" Seam; 38 to 42 in. thick.
PO—Hooversville, Pa.; SP—Landstreet, Pa.; CTY—Somerset; RR—B. & O., S. & C. branch.
S of H—1 elec locomotive. Track gauge 42 in.
S of M—Hand.
PP—Power purchased.
EMP—50.
Sales Agency, Knickerbocker Fuel Co., New York, N.Y.
Formerly the Landstreet Mine of the Margaret Smokeless Coal Co.

WILKEY & FEATHER COKE CO.
General Office, Uniontown, Pa.
Anica Mine, Drift, Pgh. Seam, 9 to 12 ft. thick.
PO—Whitsett, Pa. SP—Same. CTY—Fayette. RR—P. & L. E.
PR—James I. Feather, Uniontown, Pa.
TR—W. H. Wilkey, " "
GM—W. H. Wilkey, " "
PA—J. E. Gainer, " "
EE—E. C. Baker Co., Uniontown, Pa.
MS—James B. Cramer, Whitsett, Pa.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—1 pump
EMP—40. Coke ovens, 40 Bee Hive. Last fiscal year output, 25,000 tons Sales agency, J. H. Hillman & Sons Co., Pittsburgh, Pa.

WILLIAMS RUN COAL CO.
Williams Run Nos. 1 and 2 Mines, Drift. Lower Freeport Seam.
PO—Punxsutawney, Pa. SP—Same. CTY—Jefferson. RR—P. R. R., Bellwood Branch.
PR—John Williamson, Punxsutawney, Pa.
TR—W. S. Blaisdell, " "
GM—W. S. Blaisdell, " "
CE—W. S. Blaisdell, " "
PA—Geo. Sheldon, " "
MS—Thos. McMullen, " "
EE—N. S White, " "
SCO—Anita Supply Co. Buyer, I. B. Williams, Punxsutawney, Pa.

(Continued on Next Page)

Williams Run Coal Co.—Cont.
S of H—2 elec. locos.
S of M—16 comp. air machines.
PP—1 compressor, 1 pump, 2 boilers.
Sales agent, W. S. Blaisdell, Punxsutawney, Pa.

WILLS, JOHN.
General Office, Penna. Building, Philadelphia, Pa., 3 mines in Penna., 1 mine in W. Va.
Wills Mine Nos. 1, 2, 3; Drifts; Somerset Smokeless Seams, 45 to 50 in. thick.
PO—Berlin, Pa.; SP—Pine Hill; CTY—Somerset; RR—B. & O., Berlin Br.
PR—John Wills, ... Philadelphia, Pa.
TR—John Wills, " "
GM—John Wills, Philadelphia, Pa.
PA—W. O. Dwyer .... Berlin, Pa.
MS—W. O. Dwyer, " "
EM—Stewart Pritts .... Berlin, Pa.
MM—Geo. Glessner, " "
SM—Joe Baumors, ... Pine Hill, Pa.
S of H—Mules. Track gauge 3½ ft.
S of M—Hand.
PP—1 water tube boiler, 40 H. P.
EMP—35. Last fiscal year output 15,000 tons.
Sales agent, John Wills, Philadelphia, Pa.
Note—1 and 2 Mines idle during past year.

WINDBER COAL COMPANY
Nos. 3 & 4 Mines; Slopes & Drifts; Miller or B. Seams; 46 in. thick.
PO—Portage, Pa; SP—Same; CTY—Cambria; RR— Penna. Portage Br.
PR—Iran A. Boucher, .. Portage, Pa.
GM—Iran A. Boucher, " "
TR—Andrew B. Crichton, " "
CE—Andrew B. Crichton, " "
GS—Geo. L. Miller, " "
PA—H. A. Crichton, " "
S of H—2 elec. locos. Track gauge 36 inches.
S of M—Hand & Elec. mach.
PP—Purchase power.
EMP—60.

WINELAND-GILMORE COAL & COKE CO.
General Office, Uniontown, Pa.
Winmore Mine, Drift, Pittsburgh seam, 9 ft. thick.
PO—Smithton, Pa. SP—Same. CTY—Westmoreland. RR—B. & O.
PR—Elias Wineland, Philadelphia, Pa.
TR—R. W. Gilmore, Uniontown, Pa.
GM—R. W. Gilmore, " "
PA—R. W. Gilmore, " "
CE—F. C. Baker, " "
MS—W. H. Watt .... Smithton, Pa.
MM—Harry Wiltrout, " "
EE—Harry Wiltrout, " "
SCO—Wineland Supply Co. Buyer, W. W. Provino, Banning, Pa.
S of H—1 Elec. loco. Track gauge 42 in.
S of M—Hand.
PP—Buy Power.
EMP—40. Coke ovens, 60 Bee Hive Last fiscal year output 50,000 tons.
Sales Agent, R. W. Gilmore, Uniontown, Pa.

WITCHEY & GRIFFITH.
Harrison Mine; Drift; B or Miller Seam, 48 to 54 in. thick.
PO—Osceola Mills, Pa.; SP—Same; RR N. Y. C., P. & S. Branch.
TR—Frank Witchey.. Osceola, Mills, Pa.
MS—Frank Witchey, " "
S of H—Mules; track gauge 30 in.
S of M—Hand.
EMP—12. Last fiscal year output 8,150 tons.

WOODLAND CANNEL COAL COMPANY.
Cannel Crest Mine; Drift; B Seam; 48 to 60 in. thick.
PO—Woodland, Pa.; SP—Same; CTY—Clearfield; RR—N. Y. C.
GM—A. E Woolridge.. . Woodland, Pa.
GS—A. E. Woolridge, " "
PA—A. E. Woolridge, " "
MS—H. D. Woolridge " "
EM—E. W. Hess, " "
S of H—elec. & Gasoline locos.
S of M—Hand.
PP—Purchase power.
Last fiscal year ouput 30,000 tons.

WOODLAND COAL & COKE CO.
Woodland Colliery No. 1, Drift; "D" Seam; 4 ft 2 in. to 3 ft. 4 in. thick.
PO—Spangler, Pa. SP—Same. CTY—Cambria. RR—P. R. R., Susquehanna Branch.
PR—Geo. E. Henderson.
TR—W. Deringer, ... Spangler, Pa.
GM—W. Deringer, " "
GS—W. Deringer, " "
PA—W. Deringer, " "
MS—Chas. E, Jones, " "
S of H—Mules. Track gauge 36 in.
PP—2 Gasoline Pumps.
EMP—60. Last fiscal year output, 50,000 tons.

YORKSHIRE COAL COMPANY
Yorkshire Mine, Slope Miller or "B" Vein, Seam 2 to 6 ft. thick.
PO—Madera, Pa.; SP—Banian Junct., Pa.; CTY—Clearfield.
RR—Penna., Chesterfield Branch.

GS—Thos. McGlynn ...... Madera, Pa.
GM—Thos. McGlynn, " "
PA—Thos. McGlynn, " "
MF—Michail Wayne, Osceola Mills, Pa.
CE—Lorain Eng. Co.... Philipsburg, Pa.
EM—John Johns .... Madera, Pa.
S of H—Rope and Mules; track gauge 3 ft.
S of M—Hand and 2 elec. mach.
PP—1 Reading boiler, total 80 H. P. 2 pumps.
EMP—112. Last fiscal year output 65,553 tons.

YOUGH COAL COMPANY
Yough Mine; Drift; C Seam; 42 to 54 in. thick.
PO—Somerfield, Pa. SP—Endsley; CTY—Somerset; RR—B. & O., C. & O. branch.
PR—J. W. Endsley ..... Somerfield, Pa.
GS—J. W. Endsley, " "
PA—J. W. Endsley, " "
TR—M. J. Pritts .... Somerset, Pa.
GM—G. F. Endsley, " "
S of H—Mules.
S of M—Hand.

YOUGHIOGHENY COAL CO.
Florence Mine; Drift; Seam 4 to 5 ft. thick.
PO—Dawson, Pa.; SP—Same; CTY—Fayette; RR—B. & O.
Chairman, H. B. Moore, Dawson, Pa.
TR—R. D. Henry, " "
GM—Frank A. Tarr, " "
GS—Frank A. Tarr, " "
PA—Frank A. Tarr, " "
MS—Jas. H. Welling, " "
CE—Thos. Zimmerman. " "
MM—R. H. Stuler, ... Dawson, Pa.
EE—R. H. Stuler, " "
SCO—Florence Supply Co., " "
S of H—2 Elec. loco.; track gauge 44 in.
S of M—7 Elec. mach.
PP—2 Gen. units, 2 phase, 60 cycles. Power purchased.
EMP—125. Last fiscal year output 150,000 tons.
General Sales Manager, W. N. Stone, 1104 House Bldg., Pittsburgh, Pa.

YOUGHIOGHENY & OHIO COAL CO. THE
General Office, Cleveland, Ohio. 6 mines in Penna., 7 mines in Ohio.
PR—S. H. Robbins, .. Cleveland, O.
TR—W. L. Robinson, " "
Chairman—J. G. Patterson, Pgh., Pa
GS—A. W. Osborne, .. Cleveland, O.
PA—S. L. Thompson, " "
CS—Asst. Jas. Patterson, .. Pgh., Pa
CE—John Rees, " "
EM—W. A. Thomas, " "
MM—W. H. Williams, .. Barton, O.
EE—W. H. Williams, " "
SCO—Patterson & Robbins, Buyer, O. P. Parkin, Pittsburgh, Pa. Sales agent, H. L. Findlay, Cleveland, O.

Manifold Nos. 1 and 2 Mines; Shaft; Pgh. Seam, 5½ ft. thick.
PO—Manifold, Pa. SP—Meadows Lands, Pa. CTY—Washington. RR—P. C. C. & St. L., M. L. & Z. Branch.
MS—G. W. Smith ...... Manifold, Pa.
SM—J. R. Wood.
S of H—2 Elec. loco. and mules. Track gauge 44 in.
S of M—24 Elec. mach.
PP—10 boilers, total 750 H.P. 1 gen. unit, 2 pumps.
EMP—460.

Thompson Mine, Drift, Pgh. Seam, 5½ ft. thick.
PO—Epton, Pa. SP—Snowden, Pa. CTY—Allegheny. RR—B. & O.
MS—Jos. Pearce .... Epton P. O., Pa.
S of H—Mules and elec. Track gauge 44 in.
S of M—6 Elec. mach.
PP—2 boilers, total 300 H.P. 1 gen. unit, 3 pumps.
EMP—228.

Osborne Nos. 1 and 2 Mines: Drift Pgh. Seam, 7 to 8 ft. thick.
PO—Wyano, Pa. SP—Same. CTY—Westmoreland. RR — P. R. R., Hemler Run Branch.
MS—Wm. Davis .... Wyano, Pa.
SB—W. E. Hepler, " "
S of H—14 Elec. loco. and mules. Track gauge 44 in.
S of M—18 Elec. mach.
PP—6 boilers, total 900 H.P. 2 gen. units, 1 pump.
EMP—1145.

Enterprise, Shaft; Pgh. Seam, 8½ ft. thick.
PO—Meadow Lands, Pa. SP—Same. CTY—Washington. RR—P. C. C. & St. L., Chartiers Branch.
MS—Oscar G. Lee, Washington, Pa.
S of H—Elec. and mules. Track gauge 44 in.

Charleroi Mine, Drift, Yough. Gas Seam, 6 to 7 ft. thick.

PO—Charleroi, Pa. SP—W. Monessen. CTY—Washington. RR—P. V. &C.
MS—C. W. Hall, ... Charleroi, Pa.
S of H—14 elec. Locos. Track gauge 42 in.
S of M—20 elec. mach.
PP—Purchase power.
EMP—600. Last fiscal year output 365,000 tons.

YOUGHIOGHENY-PITTSBURGH COAL CO.
General Office, Oliver Bldg., Pittsburgh, Pa.
Soudan Mine; Slope; Pgh. Seam; 70 to 74 in. thick.
PO—Van Voorhis, Pa.; SP—Same; CTY—Washington; RR—P. V. & C.
PR—George W. Theiss.... Pittsburgh, Pa.
GM—George W. Theiss, " "
PA—George W. Theiss, " "
TR—R. C. Crawford, " "
CE—Andrews & Southard, " "
MS—David H. Parker.. Van Voorhis, Pa.
S of H—6 elec. loco. and ropes; track gauge 44 in.
S of M—8 elec. mach.
PP—Power purchased .

ZENITH COAL CO.
General Office, Oliver Bldg., Pittsburgh, Pa.
Zenith Nos. 1 and 2 Mines; Slope; L. Freeport Seam; 36 to 48 in. thick.
PO—R. F. D. No. 2, Butler, Pa.; SP—Same; CTY—Butler; RR—B. & L. E., Main Line.
PR—Chas. S. Bygate.... Pittsburgh, Pa.
TR—Fred Stover, ... Butler, Pa.
GM—Fred Stover, " "
GS—Fred Stover, " "
PA—Fred Stover, " "
SCO—Zenith Supply Co.
MS—John Faull .... Butler, Pa.
S of H—Rope and mules. Track gauge 34 in.
S of M—4 elec. mach.
PP—2 pumps; power purchased.
EMP—50. Capacity 60,000 tons. Sales agent, Theiss & Bygate Co., Pittsburgh, Pa.
Note—No. 2 Mine just opened.

TENNESSEE

For List of Abbreviations See Page 622.

BAKER, L. M. G.
Out of business.

BATTLE CREEK COAL & COKE CO.
Battle Creek Mine, Drift, Battle Creek Seam.
PO—Orme, Tenn. SP—Same. CTY—Marion. RR—N. C. & St. L.
GM—F. P. Thompson, .. Orme, Tenn.
PA—F. P. Thompson, " "
EM—J. C. Brown, " "
MS—Wm. McIntyre, " "
SM—John Sullivan ...... Orme, Tenn.
S of H—Rope and mules.
S of M—Comp. air mach. and hand.
PP—3 boilers, total 400 H. P.
EMP—200.

BEAR WALLOW COAL & COKE CO.
General Office, Knoxville, Tenn.
Bear Wallow Mine, Drift, Coal Creek Seam, 28 to 48 in. thick.
PO—Caryville, Tenn.; SP—Same; CTY—Campbell; RR—Sou. Ry.
PR—J. L. Boyd ...... Knoxville, Tenn.
TR—J. L. Boyd, " "
GM—L. O. Stone, .. Caryville, "
MS—L. O. Stone, " "
PA—D. K. Hendren, " "
SM—D. K. Hendren, " "
EE—Chas. Harmon, " "
MM—Chas. Harmon, " "
CE—G. W. Wendling, Coal Creek, Tenn.
S of H—4 Elec. loco.; track gauge 36 in.
S of M—5 elec. mach.
PP—1 return tubular boiler, total 150 H. P.., 1 gen. unit, 250 volts D. C., 1 pump.
EMP—100. Last fiscal year output 60,000 tons. Sales Agent, J. L. Boyd, Knoxville, Tenn.

BIG BRUSSHY FUEL CO.
Big Brushy Nos. 1 and 2 Mines; Drifts; Jellico or Brushy Mountain Seam; 27 to 47 in. thick.
PO—Petros, Tenn. SP—Same. CTY—Morgan. RR—H. & N. E.
PR—J. R. Riddle.. Chattanooga, Tenn.
TR—J. R. Riddle, " "
GM—A. W. Evans .... Petros, Tenn.
GS—A. W. Evans, " "
CE—A. W. Evans, " "
PA—W. H. Gibson, " "
MS—Harry Brown, " "
SM—W. W. Gibson, " "
EE—Frank Lankford, " "
MM—John Bennett, " "
S of H—2 elec. loco. Track gauge 36 in.
S of M—3 elec. mach.
PP—2 Walsh & Weidner return tubular boilers, total 300 H. P., 1 gen. unit, 250 volts D. C., 1 comp., 1 pump.
EMP—46. Last fiscal year output 42,000 tons. Sales agent, Geo. P. Howard, Atlanta, Ga.
Note—Formerly Big Brushy Coal Co.

BLACK DIAMOND COLLIERIES, THE
General Office, Knoxville, Tenn.
Black Diamond Mines No. 1 and 4; Drifts; Coal Creek Seam, 40 to 48 in. thick.
PO—Coal Creek, Tenn. SP—Same. CTY—Anderson. RR—Sou.
PR—S. B. Luttrell ...... Knoxville, Tenn.
TR—Wm. F. Searle, " "
Secy—Wm. F. Searle, " "
GM—L. J. A. Petree, Coal Creek, Tenn.
PA—L. J. A. Petree, " "
MS—John Sharp, " "
SCO—Black Diamond and Beech Grove Stores, Coal Creek, Tenn.
S of H—Mules, rope and elec. loco.
S of M—Hand.
PP—2200 volts A. C., 5 boilers, 625 H. P.
EMP—240. Last fiscal year output 145,000 tons.
Sales Agent, Wm. F. Searle, Knoxville, Tenn.

BLANKENSHIP, BOSS
Baird, B. G., Mine.
PO—Elk Valley, Tenn.; CTY—Campbell.
No report.

BLOCK COAL & COKE CO.
General Office, Knoxville Tenn.
Monarch Mine; Drift; Dean Seam, 54 in. thick; Operate Washery.
PO—Block, Tenn.; SP—Same; CTY—Campbell: RR—Sou.
PR—Robert Wedekind, Louisville, Ky.
TR—W. G. Polk, " "
GM—L. I. Coleman, Knoxville, Tenn.
GS—John P. Gorman, ... Jellico, Tenn.
PA—J. L. Slusher, " "
MS—M. K. Marlow, ... Block, Tenn.
EM—G. D. Cummings, Jellico, Tenn.
SCO—Address thte Company, Block, Tenn.
S of H—Mules.
S of M—10 Comp. air mach.
PP—2 Return tubular boilers, total 200 H.P., 1 compressor, 3 pumps.
EMP—120. Last fiscal year outptut 75,000 tons.

BLUE GEM COAL CO.
Blue Gem Mine, Drift, "Blue Gem" Seam, 20 to 28 in. thick.
PO—Jellico, Tenn. SP—Same. CTY—Campbell. RR—Southern Ry.
PR—Joseph E. Moses... Louisville, Ky.
TR—L. Salomon, " "
GM—Jas. F. MacPherson. Jellico, Tenn.
GS—P. J. Cross, " "
PA—K. E. Smith, " "
SM—O. R. Baird, " "
MS—Samuel Marion, " "
CE—B. L. Lloyd, " "
S of H—Mules. Track gauge 42 in.
S of M—Hand.
EMP—150. Last fiscal year output 100,000 tons.
Sales agent, Jas. F. Macpherson, Jellico, Tenn.

BON AIR COAL & IRON COMPANY

General Office, Nashville, Tenn.
Mines of above company being operated by Robert Vaughan and R. G. Lewis, Receivers, Nashville, Tenn.
PR—John P. Williams. .Nashville, Tenn.
GM—J. M. Overton, " "
PA—C. Cooper, " "
GS—W. F. Dibrell......Bon Air, Tenn.
MS—J. L. Ledford, " "
EE—F. Buop, " "
SCO—Address the Company. Buyer, J. C. Dass, Bon Air, Tenn.

Bon Air Mine; Shaft; Bon Air Seam; 24 to 48 in. thick.
PO—Bon Air, Tenn.; SP—Same; CTY—White; RR—N. C. & St. L., Sparta branch.
S of H—3 elec. locos. Track gauge 42 in
S of M—6 elec. mach.
PP—3 Atlas water tube boilers, total 450 H. P., 1 gen. unit and 1 steam hoist, 250 volts D. C., 1 pump.
EMP—150. Last fiscal year output 59,000 tons.

Ravenscroft Mine; Shaft; Ravenscroft Seam; 36 to 72 in. thick.
PO—Ravenscroft, Tenn.; SP—Same; CTY—White; RR—N. C. & St. L., Sparta Br.
MS—G. B. Thorn....Ravenscroft, Tenn.
SM—Wm. Bailey, " "
S of H—Mules and rope. Track gauge 42 in.
S of M—27 comp. air mach.
PP—6 water tube boilers, total 600 H. P., 1 pump and 3 air compressors.
EMP—150. Last fiscal year output 99,000 tons.

BONNEY, H. B. COAL COMPANY.

Bonney Mine; Drift; Old Etna Seam; 30 to 36 in. thick.
PO—Whitside, Tenn; SP—Same; CTY—Marion; RR—N. C. & St. L.
PR—H. B. Bonney, . .Chattanooga, Tenn.
TR—H. B. Bonney, " "
GM—A. McDonald, ...Whitside, "
GS—A. McDonald, " "
PA—A. McDonald, "
MS—J. C. Allison, " "
S of H—Mules.
SCO—Address the Company, Buyer J Clown, Whitside, Tenn.
Note—Successors to Castle Rock Coal Co.

BOTTOMLEE & FAGAN

Hooper Mine, Drift, Hooper Seam 28 in. thick.
PO—Harriman, Tenn., R. 4; SP—Christmas Siding; CTY—Morgan; RR—H. & N. E.
PR—J. A. Fagan.....Coalfield, Tenn.
GM—N. L. Bottomlee, R. 4, Harriman, Tenn.
MS—J. A. Fagan......Coalfield, Tenn.
SM—N. L. Bottomlee, " "
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—1 pump.
EMP—2. Last fiscal year output 750 tons.

BRIER HILL COLLIERIES CO. (THE)

General Office, Crawford, Tenn.
Brier Hill Mine; Drift; Bon Air No. 2 Seam, 36 to 54 in. thick
PO—Crawford, Tenn.; SP—Same; CTY—Overon; RR—Tenn. Cent.
PR—S. L. Kamps, New York City, N. Y.
TR—Eben Richards, " "
GM—P. F. Ligon......Monterey, Tenn.
PA—P. F. Ligon, " "
MS—E. P. Tipton......Crawford, Tenn.
SM—C. B. Wheeler, " "
EM—J. C. Laird.....Harriman, Tenn.
MM—W. B. Ford,....Crawford, Tenn.
EE—W. B. Ford, " "
CE—R. A. Shiplett....Harriman, Tenn.
S of H—3 Elec. loco.; track gauge 36 in.
S of M—Hand and 1 elec. mach.
PP—1 Atlas return tubular boiler, total 150 H. P., 1 gen. unit, 250 volts D. C., 3 pumps.
EMP—90. Last fiscal year output 73,000 tons.

BRUSHY MOUNTAIN COAL MINES.

(State mine and operated by convicts.)
Brushy Mt. Mines; Drift, Jellico and Brushy Mt. Seam; 24 to 60 in. thick. Operate washery.
PO—Petros, Tenn; SP—Same; CTY—Morgan; RR—H. & N. E., C. N. O. & T. P.
GM—W. M. Nixon.......Petros, Tenn.
PA—W. W. Baird....Nashville, Tenn.
GS—A. W. Evans......Petros, Tenn.
MS—A. W. Evans, " "
EM—A. W. Evans. " "
MM—F. M. Patrick, " "
EE—C. J. Schaeffer, " "
SM—W. W. Baird....Nashville, Tenn.
S of H—12 Elec. loco. and mules; track gauge 36 in.
S of M—2 Elec. mach.
PP—2 Casey-Hedges, 2 Walsh & Weidner, return tubular boilers, total 550 H. P., 250 volts D. C., 4 pumps.
EMP—319. Last fiscal year output 225,400 tons. Coke ovens, 140.
Sales Agent, W. M. Nixon, Petros, Tenn.

BRYSON MTN. COAL CO.

General Office, Bryson, Tenn.
Bryson Mtn Mine, Drift, Bryson Seam, 54 to 84 in thick.
PO—Bryson, Tenn. SP—Middlesboro, Ky. CTY—Claiborne. RR—L. & N. and Southern.
PR—Tim Cockill....Mahanoy City, Pa.
TR—Tim Cockill, " "
GM—J. H. Keeney, . .Middlesboro, Ky.
GS—J. H. Keeney, " "
MS—J. H. Keeney, " "
PA—A. B. Keeney, " "
EM—J. C. Richardson. .Middlesboro, Ky.
EE—J. Whitted.........Bryson, Tenn.
SCO—Address the Company. Buyer, A. B. Keeney, Middlesboro, Ky.

Bryson Mt. No. 1 Mine; Drift; Mingo Seam; 66 to 72 in. thick.
PO—Bryson, Tenn.; SP—Bryson Mt.; CTY—Claiborne; RR—L. & N., and Sou.
S of H—2 elec. locos. Track gauge 44 in.
S of M—Hand.
PP—4 Tudor return tubular boilers, 1 gen. unit, 250 volts D. C., 2 pumps.
EMP—30. Last fiscal year output 60,000 tons.

Bryson Mt. No. 2 Mine, Drift; Poplar Lick Seam; 72 to 84 in. thick.
PO—Bryson, Tenn.; SP—Bryson Mt.; CTY—Claiborne; RR—L. & N. and Sou.
S of H—1 elec. loco. Track gauge 44 in.
S of M—Hand.

CAMPBELL COAL MINING CO.

General Office, Westbourne, Tenn.
PR—Alex Bonnyman. . .Knoxville, Tenn.
TR—J. B. Campbell........Atlanta, Ga.
GS—Jos. Richards . .Westbourne, Tenn.
PA—Chas. Cochran, " "
EM—David Lindamood, " "
MM—H. D. Kivit, " "
SCO—Westbourne Coal Co. Buyer, Chas. Cochran, Westbourne, Tenn.
Sales agent, R. O. Campbell Coal Co., Atlanta, Ga.

Westbourne Mine, Drift, Log Mountain Seam, 42 in. thick. Operate Washery.
PO—Westbourne, Tenn.; SP—Same (Prepay); CTY—Campbell; RR—L. & N.
MS—Hopkin Bevan. . .Westbourne, Tenn.
S of H—6 Elec. loco.; track gauge 36 in.
S of M—6 elec. and 23 comp. air mach.
PP—7 return tubular boilers, total 1050 H. P., 3 gen. units, 250 volts D. C., 3 comp. and 6 pumps.
EMP—300. Last fiscal year output 203,664 tons.

Jackson Mine; Drift; Log Mtn. Seam, 42 in. thick.
PO—Westbourne, Tenn.; SP—Same (prepay); CTY—Campbell; RR—L. & N. and Southern.
S of H—Mules.
MS—H. Bevan......Westbourne, Tenn.
S of M—2 comp. air mach.
EMP—30. Last fiscal year output 8,233 tons.

Egan Mine; Drift; Jellico Seam, 34 to 42 in. thick.
PO—Egan, Tenn.; SP—Same (Prepay); CTY—Claiborne; RR—L. & N., Sou.
MS J. R. Robinson......Eagan, Tenn.
S of H—4 Elec. loco.; track gauge 36 in.
S of M—22 comp. air mach.
PP—3 Return tubular boilers, total 450 H. P., 1 gen. unit, 250 volts D. C., 2 comp., 3 pumps.
EMP—125. Last fiscal year output 82,136 tons.

Starbourne Mine; Drift; Rich Mountain Seam; 32 to 36 in. thick.
PO—Gatliff, Tenn.; SP—Remy, Tenn., (Prepay); CTY—Campbell; RR—L. & N.
MS—H. Bevan......Westbourne, Tenn.
SM—Charles Cochran, " "
S of H—Mules and 1 elec. loco. Track gauge 36 in.
S of M—3 elec. mach.
PP—1 pump, 2300 volts A. C., 3 phase, 250 volts D. C., inside. Also obtain power from Westborne Mine.
EMP—50. Last fiscal year output 10,025 tons.
Formerly operated by Remy Coal Co.

CASTLE ROCK COAL & COKE CO.

See H. B. Bonner Coal Co.

CHASKA COAL CO.

Receiver, John L. Boyd, Knoxville, Tenn.
Chaska Nos. 3 and 4 Mines; Slopes; Rich Mountain Seam, 28 to 47 in. thick.
PO—Chaska. Tenn. SP—Same. CTY—Campbell. RR—L. & N.
GM—John L. Boyd,....Knoxville, Tenn.
PA—John L. Boyd, " "
GS—W. M. Sexton......Chaska, Tenn.
MS—W. M. Sexton, " "
CE—E. D. Cummings. . .Knoxville, Tenn.
SM—John W. Eldridge,...Chaska, Tenn.
S of H—1 elec. loco. and mules. Track gauge 36 in.
S of M—1 elec. mach. and hand.
PP—1 Atlas boiler, 75 H. P., gen. unit 250 volts D. C., and 1 pump.
EMP—62. Last fiscal year output 30,184 tons.
Sales Agency, Superior Coal Co. Knoxville, Tenn.

CHATTANOOGA IRON & COAL CORP.

General Office, Chattanooga, Tenn.
Dunlap Mine, Sewanee Seam, 40 in. thick. Operate washery.
PO—Dunlap, Tenn. SP—Same. CTY—Sequatchie; RR—N. C. & S. & L.
PR—C. E. Buek. . .Chattanooga, Tenn.
TR—H. R. Lacey, " "
GM—H. R. Lacey, " "
PA—G. H. Jacoway, " "
MS—J. M. Smith........Dunlap, Tenn.
SM—C. M. Garvich, " "
S of H—Mules, rope and 2 steam locos. Track gauge 36 in.
PP—3 return tubular boilers, total 500 H. P.
EMP—400.
Coke Ovens—168 Bee Hive.

CLAIRFIELD JELLICO COAL CO.

Dift Mine; Jellico Seam, 39 to 48 in. thick.
PO—Clairfield, Tenn.; SP—Same; CTY—Clairborne; RR—Southern & L. N.
PR—P. E. Bennett....Clairfield, Tenn.
GM—P. E. Bennett " "
MS—W. B. Hall, " "
TR—J. R. Baird, Clairfield, Tenn.
PA—J. R. Baird, " "
EM—B. L. Lloyd.........Jellico, Tenn.
S of H—2 Elec. loco.
S of M—3 Elec. mach. and hand.
PP—2 Water Tube Boilers; total, 300 H.P.
Last fiscal year output 113,064 tons.
Successors to the King Mountain Coal Co.

CLIFTY CONSOLIDATED COAL CO.

Clifty Mine, Drift, Sewanee Seam; 24 to 60 in. thick.
PO—Clifty, Tenn. SP—Same. CTY—White. RR—N. C. & St. L. Tullahoma Branch.
PR—W. P. Dodge....Springfield, Mass.
TR—E. G. Rice, " "
GM—W. B. Young ......Clifty, Tenn.
GS—W. B. Young, " "
PA—R. E. McCormick, " "
MM—G. W. O'Neal, " "
SCO—Clifty Store. Buyer, R. E. McCormick, Clifty, Tenn.
S of H—Mules and 2 gasoline locos. Track gauge 36 in.
S of M—Hand.
PP—1 water tube boiler, 205 H. P.
EMP—250. Last fiscal year output 95,723 tons.

Clifty No. 3 Mine; Drift; Sewanee Seam; 24 to 60 in. thick.
PO—Clifty, Tenn.; SP—Same; CTY—White; RR—N. C. & S. L., Tullahoma Branch.
S of H—Mules.
S of M—Hand.
EMP—14. Last fiscal year output 12,000 tons.

COAL CREEK COAL CO.

General Office, Knoxville, Tenn.
Fraterville Thistle Mine; Drift; Coal Creek Seam; 48 in. thick.
PO—Coal Creek, Tenn.; SP—Same; CTY—Anderson; RR—Southern, Coal Creek branch.
PR—E. C. Camp.......Knoxville, Tenn.
TR—E. C. Camp, " "
GM—E. C. Camp, " "
PA—H. N. Camp, " "
MS—W. H. Branscom, Coal Creek, Tenn.
EM—Gustave Murmann, " "
MM—P. S. Wyatt, " "
SM—J. A. Rowe, " "
SCO—Coal Creek Coal Co., Coal Creek, Tenn.
S of H—Mules, rope and 1 steam loco. Track gauge 36 in.
S of M—Hand.
PP—4 Dallas return tubular boilers, total 550 H. P., 1 pump.
EMP—150. Last fiscal year output 75,363 tons.
Sales Manager, G. M. Camp, Knoxville, Tenn.

COALFIELD COAL CO.

General Office, Knoxville, Tenn.
No. 1 Mine; Slope; Coal Creek Seam; 48 in. thick
PO—Coalfield, Tenn. SP—Same. CTY—Morgan. RR—G. N. O. & T. P., H. & N. E. Div.
PR—W. S. Robinson....Harriman, Tenn.
TR—C. W. Henderson. . .Knoxville, Tenn.
GM—Harry R. Smith....Coalfield, Tenn.
GS—Harry R. Smith, " "
PA—Harry R. Smith, " "
MS—J. A. Fagan, " "
MM—Ike Miller, " "
CE—J. C. Laird.....Harriman, Tenn.
EM—J. C. Laird, " "
SCO—Address the Co. Buyer, Harry R. Smith, Coalfield, Tenn.
S of H—Mules.
S of M—Hand.
PP—2 return tubular boilers, total 45 H. P., 1 pump.
EMP—75. Last fiscal year output 48,000 tons.
Sales agent, Coalfield Coal Co., Knoxville, Tenn.

CONGER COAL CO.

General Office, Chattanooga, Tenn.
Conger Mine; Drift; Coal Creek Carboniferous Seam, 52 in. thick.
PO—Coalfield, Tenn.; SP—Same; CTY—Morgan; RR—H. & N. E.
PR—Iliff Conger,...Chattanooga, Tenn.
TR—Iliff Conger, " "
GM—John E. Patton, " "
GS—James I. Sweeton, Coalfield "
MS—James I. Sweeton, " "
PA—S. A. Patton, " "
CE—George Cain, . .Coalmont, "
EM—George Cain, " "
SCO—Address the Co. Buyer S. A. Patton, Coalfield, Tenn.
S of H—1 elec. loco. Track gauge 36 in.
S of M—2 elec. mach.
PP—2 Boilers, total 400 H.P., gen. unit, 250 volts D. C., 2 pumps.
EMP—60. Last fiscal year output 22,156 tons.
Sales Agency, Sewanee Fuel & Iron Co., Chattanooga, Tenn.

CROSS MOUNTAIN COAL CO.

General Office, Knoxville, Tenn.
Cross Mountain Mine; Drift; Coal Creek Seam, 42 to 48 in. thick.
PO—Briceville, Tenn. SP—Same. CTY—Anderson. RR—Southern.
GM—W. P. Davis......Knoxville, Tenn.
TR—E. D. Attix, " "
PA—W. P. Davis......Knoxville, Tenn.
PA—J. W. Copeland....Briceville, Tenn.
GS—P. F. Lynch....Briceville, Tenn.
EM—P. F. Lynch, " "
MS—P. F. Lynch, " "
MM—W. F. Shutt, " "
EE—W. F. Shutt, " "
SCO—Address the Co. Buyer, J. W. Copeland, Briceville, Tenn.
S of H—9 elec. locos. Track gauge 32 in.
S of M—2 Sullivan elec. mach.

PP—4 return tubular boilers, 500 H. P., 2 gen. units, 250 volts D. C., 100 K. W. and 200 K. W., 1 pump.
EMP—250. Last fiscal year output 100,000 tons.

DAVIDSON, E. COAL CO.

Davidson Mine; Drift; No. 2 or Bon Air Seam; 54 to 60 in. thick.
PO—Davidson, Tenn.; SP—Same; CTY—Fentress; RR—Tenn. Cent., Crawford branch.
PR—R. F. Pope.......Davidson, Tenn.
GM—R. E. Pope .....Davidson, Tenn.
MS—R. F. Pope, " "
PA—R. F. Pope " "
TR—L. Clark, " "
S of H—Mules and 1 Steam loco.
S of M—Hand.
PP—1 pump. Purchase power.
EMP—35. Last fiscal year output 25,000 tons

DURHAM COAL & IRON CO.

General Office, Chattanooga, Tenn.
3 Mines in Tenn. 1 Mine in Ga.
PR—Chas. B. Eddy. .New York, N.Y.
TR—A. Rothbarth, " "
GM—L. T Wolle....Chattanooga, Tenn.
GS—J. H. Jones..........Soddy, Tenn.
PA—J. H. Jones, " "
EM—Z. V. Myers, " "
EE—Paul Theasher, " "
MM—C. W. McMillan. . .Pittsburg, Ga.
Sales agent, A. C. Stephenson, Chattanooga, Tenn.

Soddy Mine, Drift, Soddy No. 7 Seam, 24 to 60 in. thick. Operate washery.
PO—Soddy, Tenn. SP—Rathburn, Tenn. CTY—Hamilton. RR—C. N. O. & TP.
SM—T. H. McKown......Soddy, Tenn.
S of H—2 Elec. loco., mules, rope and gravity; track gauge 36 in.
S of M—Hand.
PP—10 return tubular boilers, total 1,000 H. P., 4 gen. units, 240 volts D. C., 2 air comp. and 12 pumps.
EMP—500. Coke ovens, 211 Bee Hive. Last fiscal year output 167,000 tons.

Big Soddy, Drift, Soddy No. 7 Seam, 24-96 in thick.
PO—Soddy, Tenn. SP—Chamberlain, Tenn. CTY—Hamilton. RR—C. N. & T. P.
SM—T. H. McKown.......Soddy, Tenn.
S of H—Mules, rope and gravity. Track gauge 36 in.
S of M—Hand
PP—1 return tubular boiler, 100 H. P.,
EMP—80. Last fiscal year output 12,000 tons.

Graysville Mine, Drift, Richland and No. 5 Seam, 24 to 60 in. thick.
PO—Graysville, Tenn. SP—Same. CTY—Rhea. RR—C. N. O. & T.P.

(Continued on Next Page)

Durham Coal & Iron Co.—Cont.
SM—Lester Gumsley...Graysville, Tenn.
S of H—2 steam loco., rope and mules. Track gauge 36 in.
S of M—Hand.
PP—4 return tubular boilers, total 400 H. P., 4 engines and 2 pumps.
EMP—120. Coke ovens 75 Bee Hive.
Last fiscal year output 42,000 tons.

Durham Mine, Drift, Durham No. 5 Seam, 36-60 in. thick. Operate washery.
PO—Pittsburg, Ga. **SP**—Durham, Ga. CTY—Walker. RR—C. of Ga.
MS—C. W. McMillan..Pittsburg, Ga.
SM—G. W. Newgent, " "
S of H—Steam and 4 Gasoline loco. and mules. Track gauge 36 in.
S of M—Hand.
PP—12 internally fired boilers, total 1,000 H. P., 4 gen. units, 2 air comp. and 8 pumps.
EMP—551. Coke ovens, 201 Bee Hive.
Last fiscal year output 165,000 tons.

EAGLE COAL CO.
Poplar Creek Mine, Drift, Seam 4 ft. thick.
PO—Oliver Springs, Tenn. CTY—Morgan. RR—Sou.
PR—W. D. Richards, Oliver Springs, Tenn.
GM—W. D. Richards, Oliver Springs, Tenn.
MS—W. D. Richards, Oliver Springs, Tenn.
State report.

ELK VALLEY BLUE GEM COAL CO.
Elk Valley Blue Gem Mine, Drift, "Blue Gem" Seam, 20 in. thick.
PO—Elk Valley, Tenn. SP—Same. CTY—Campbell. RR—Southern.
PR—Lewis Baird ....Elk Valley, Tenn.
GM—Lewis Baird, " "
MS—J. H. Owens, " "
SM—Bass Blankenship, " "
S of H—Mules. Track gauge 3½ ft.
S of M—Hand.
EMP—10. Last fiscal year output 1,500 tons.
Sales agent, J. R. Barry, Chattanooga, Tenn.
Note—Idle. Expect to resume shortly.

EVANS COAL CO.
Evans Mine, Drift, "Blue Gem" Seam, 22 in. thick.
PO—Jellico, Tenn. SP—Same. CTY—Campbell. RR—Southern
PR—P. F. Garmon, Jr....Hazard, Ky.
TR—J. L. Slusher .....Jellico, Tenn.
PA—J. L. Slusher, " "
MS—J. L. Slusher....Jellico, Tenn.
S of H—Mules. Track gauge 42 in.
S of M—Hand.

FALLS BRANCH COAL CO.
PR—P. Wooldridge..Pewee Valley, Ky.
TR—Jas.R.Wooldridge. Wooldridge Tenn
GM—Jas. R. Wooldridge, " "
GS—Wm. Dinkelaker, " "
MS—J. W. Howe, " " Wooldridge, Tenn.
PA—J. H. Queener.Wooldridge, Tenn.
MM—Jas. Luntsford...Woolridge, Tenn.
SM—J. H. Queener, " "
EM—B. L. Lloyd ......Jellico, Tenn.

Falls Branch Mine; Drift; Jellico Seam. 28 to 72 in. thick.
PO—Wooldridge, Tenn. SP—Oswego, Tenn. (Prepay) CTY—Campbell. RR—Southern.
S of H—2 steam, 1 gasoline loco. and mules; track gauge 39 in.
S of M—Hand.
PP—3 pumps.
EMP—150. Last fiscal year output 61,878 tons.
Sales agent, Jas. R. Wooldridge, Wooldridge, Tenn.

Powhatton Mine; Drift; Blue Gem Seam; 18 to 30 in. thick.
PO—Woolridge, Tenn.; SP—Oswego, Tenn.; CTY—Campbell; RR—Southern.
S of H—Mules and 1 gasoline loco. Track gauge 39 in.
S of M—Hand.
PP—2 pumps.
EMP—50. Last fiscal year output 12,316 tons.

FENTRESS COAL & COKE CO. (THE)
General Office, Philadelphia, Pa.
Wilder No. 3 Mine, Drift, Bon Air No. 2 Seam; 54 to 62 in. thick.
PO—Wilder, Tenn. SP—Same. CTY—Fentress. RR—T. C. R. R. Co. Crawford Branch.
PR—G. H. Taylor...Philadelphia, Pa.
TR—G. H. Taylor, " "
Cashier—C. E. Wilkinson, Wilder, Tenn.
GM—W. J. Nixon..Chattanooga, Tenn.
GS—U. K. Custred.......Wilder, Tenn.
MS—Alvin Adkins, " "
PA—U. K. Custred, " "
EM—U. K. Custred, " "
MF—Alvin Adkins, " "
SM—G. H. Shacklett, " "
MM—A. W. Long, " "
EE—A. W. Long, " "
S of H—4 elec. locos. Track gauge 3 ft
S of M—3 elec. mach.
PP—2 Erie return tubular boilers, total 250 H. P., 1 gen. unit 220 volts D. C., 1 pump.
EMP—210. Last fiscal year output 126,723 tons.
Sales agent, W. J. Nixon, 522 James Bldg., Chattanooga, Tenn.

FERGUSON MINING CO.
Ferguson Mine, Drift, Sewance Seam.
PO—Coalmont, Tenn. SP—Same. CTY—Grundy. RR—N. C. & St. L.
GM—J. B. Ferguson..Coalmont, Tenn.
PA—J. B. Ferguson, " "
EM—M. J. Ferguson, " "
MS—D. W. Sartain, " "
SM—J. B. Ferguson, " "
S of H—Mules.
S of M—Hand.
(Old information.)

FLAT BRANCH COAL CO.
Flat Branch Mine, Drift, Sewanee Seam, 25 to 60 in. thick.
PO—Tracy City, Tenn. SP—Flat Branch CTY—Grundy. RR—N. C. & St. L., Tracy City Branch.
PR—G. Sykes.......Tracy City, Tenn.
TR—G. M. Thorogood, " "
PA—G. M. Thorogood, " "
SM—G. M. Thorogood, " "
GM—J. D. Flanagan, " "
GS—J. D. Flanagan, " "
MS—T. Shadrick, " "
EM—Geo. Kane, " "
S of H—Mules. Track gauge 26 in.
S of M—Hand.
EMP—50. Last fiscal year output 24,000 tons.

FORK RIDGE COAL & COKE CO.
Nos. 1 and 2 Mines; Drifts; Mason Seam; 4½ to 6 ft. thick. Operate washery.
PO—Fork Ridge, Tenn. SP—Middlesboro, Ky. CTY—Clairborne. RR—L. & N.
PR—C. S. McManus.Fork Ridge, Tenn.
TR—D. G. Hinks, " "
PA—D. G. Hinks, " "
GS—John Lewis......Fork Ridge, Tenn.
MM—L. Hines, " "
EE—L. Hines, " "
SM—C. S. Collier, " "
CE—J. C. Richardson.Middlesboro, Ky.
S of H—12 elec. loco. Track gauge 42 in.
S of M—3 elec. mach. and hand.
PP—6 water tube boiler, total 900 H. P., 3 gen. units, 250 volts D. C.
EMP—600. Last fiscal year output 278,000 tons.

FOX BLUE GEM COAL CO.
See Hicks Blue Gem Coal Co.

HICKS BLUE GEM COAL CO.
Shaft Mine; Blue Gem Seam; 18 to 24 in. thick.
PO—Elk Valley, Tenn.; SP—Same; CTY—Campbell; RR—Sou.
PR—T. S. Hicks......Elk Valley, Tenn.
SM—T. S. Hicks, " "
MS—T. S. Hicks, " "
S of M—Hand.
Note Successors to Fox Blue Gem Coal Co.

HIGHCLIFF COAL CO.
General Office, Knoxville, Tenn.
Highcliff Mine; Drift; Log Mtn. & Mingo Seams; 65 to 67 in. thick.
PO—Pruden, Tenn. SP—Same. CTY—Claiborne. RR—Southern Ry. and L. & N., Clearfork Branch.
PR—Alex Bonnyman..Knoxville, Tenn.
GM—Alex Bonnyman, " "
TR—J. B. Campbell ....Atlanta, Ga.
GS—Joseph Richards..Westbourne, Tenn.
PA—Chas. Cockran...Westbourne, Tenn.
MS—Jas. Carmack......Pruden, Tenn.
SM—Chas. Cochran..Westbourne, Tenn.
EM—David Lindawood, " "
S of M—Hand.
S of H—Mules and 2 6-ton Jeffrey elec. locos. Track gauge 42 in.
PP—1 water tube boiler, total 150 H. P., 1 gen. unit, 150 volts D. C.
EMP—150. Output 131,000 tons.
Sales Manager, D. C. Campbell, Knoxville, Tenn.

HIGHLAND COAL & LUMBER CO.
Highland Mine Drift, Bon Air Seam, 36 to 60 in. thick.
PO—Davidson, Tenn.; SP—Same; CTY—Fentress; RR—Tenn. Cent.; Wilder Br.
PR—W. V. Davidson....Nashville, Tenn.
TR—L. Clark.........Davidson, Tenn.
EM—Fred Custred......Davidson, Tenn.
MS—W. N. Pope, " "
SCO Address the Company. Buyer, Horace Lee, Davidson, Tenn.
S of H—Mules and gasoline loco.
S of M—Hand.
PP—2 pumps.
EMP—100. Last fiscal year output 95,000 tons.

ITALIAN BLUE GEM COAL CO.
Italian Mine, Jellico Seam, 37 to 38 in. thick.
PO—Newcomb, Tenn. SP—Same. CTY—Campbell. RR—Southern, West Side Branch.
PR—A. B. Baird ......Jellico, Tenn.
TR—C. O. Baird, " "
CE—D. C. Barker, " "
EM—D. C. Barker, " "
GM—Peter Zechini ....Newcomb, Tenn.
PA—Peter Zechini, " "
GS—Thos. Zecaini, " "
S of H—Mules. 1 comp. air loco. Track gauge 36 in.
S of M—Hand., 4 mining mach.
PP—Boilers, total 150 H. P.

JACKSON BROS. COAL CO.
General Office, Oliver Springs, Tenn.
Jackson Mine, Drift, Coal Creek Seam. 42 in. thick.
PO—Oliver Springs, Tenn. SP—Same. CTY—Roane; RR—Southern, Big Mountain branch.
PR—Thomas Jackson Oliver Springs, Tenn.
GM—Thos. Jackson.Oliver Springs, Tenn
TR—Alex. Jackson, " "
PA—Alex. Jackson, " "
MS—Alex Jackson, " "
SM—Alex. Jackson, " "
CE—Geo. E. Nettlon, Coal Creek, Tenn.
EM—J. C. Webster, Coal Field, Tenn.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
EMP—14. Last fiscal year output 2500 tons.

JELLICO CANNEL COAL CO.
General Office, Massillon, Ohio.
Drift Mine; Cannel Seam, 32 to 40 in. thick.
PO—Newcomb, Tenn. SP—Same. CTY—Campbell. RR—Southern.
PR—Thos. N. Nordue....Chicago, Ill.
TR—F. F. Taggart .....Massillon, O.
GM—W. H. Jenkins...Newcomb, Tenn.
PA—W. H. Jenkins, " "
SM—W. H. Jenkins, " "
CE—D. C. Barker....Jellico, Tenn.
EM—D. C. Barker, " "
S of H—Mules, rope, gravity and 1 steam loco. Track gauge 36 in.
S of M—8 comp. air mach.
PP—8 Compressors, 2 pumps.
Note—Idle during past year.

JONES H. M. COAL CO.
Jameson Mine, Drift, Blue Gem Seam.
PO—Jellico, Tenn. SP—Same. CTY—Campbell. RR—Sou.
GM—H. M. Jones......Jellico, Tenn.
PA—Fred Adkins, " "
MS—Geo. Snoderly, " "
EM—G. D. Cummings, " "
S of H—Elec. loco. and mules.
S of M—Hand.
EMP—100.
(Old information.)

KENTUCKY-TENNESSEE COAL CO.
Fresno Mine; Drift; Rich Mtn. Seam, 40 to 50 in. thick.
PO—Cupp, Tenn.; SP—Fresno, Tenn.; CTY—Campbell; RR—L. & N., Main Line.
PR—J. R. Barnes, Chattanooga, Tenn.
TR—J. R. Barnes, " "
GM—Sol. L. Smith, Williamsburg, Ky.
MS—Sol. L. Smith, " "
PA—Bert Facinola, ...Cupp, Tenn.
EM—D. C. Barker, ...Jellico, Tenn.
S of H—Mules.
S of M—Hand.
EMP—65. Output 30,000 tons.
Sales Agency, Royal Con. Coal Co., Knoxville, Tenn.

KIMBERLEY COAL CO.
Cupp Mine; Drift.
PO—Cupp, Tenn.; SP—Kimberley, Tenn.; CTY—Campbell; RR—L. & N.
PR—Geo. P. Chandler....Cupp, Tenn.
GM—Geo. P. Chandler, " "
MS—G. R. Brooks, " "
S of H—4 Elec. loco.; track gauge 42 in.
S of M—Hand and 5 Elec. mach.
PP—2 Boilers, oal 300 H. P., 1 gen. unit, 250 volts D. C., and 1 pump
EMP—100.

KNOX MINING CO.
Roane Iron Co., Colliery; Slope; Sewanee Seam.
PO—Rockwood, Tenn.; SP—Same; CTY—Roane RR—C. N. O. & T. P. Operate washery.
PR—E. O. Wells......Rockwood, Tenn.
GM—E. O. Wells, " "
TR—C. F. Millican, " "
Secy—C. F. Millican, " "
GS—W. T. Richards, " "
EM—Geo. E. Sylvester, " "
MM—E. W. Morris, " "
SCO—Roane Iron Co. Store Rockwood, Tenn.
S of H—4 Gasoline loco, mules and rope; track gauge 32 in.
S of M—Hand.
PP—6 Boilers, 2 compressors, 4 pumps.
EMP—300. Last fiscal year output 170,473 tons. Coke ovens, 375 Bee Hive.
Entire output sold to Roane Iron Co.
Formerly the Old Mine of the Roane Iron Co.

LAFOLLETTE COAL & IRON COMPANY
General Office, LaFollette, Tenn.
PR—Neil Robinson....LaFollette, Tenn.
GM—Neil Robinson, " "
TR—W. H. McGee, " "
PA—(Coal Dept.)—G. M. Shoemaker, LaFollette, Tenn.
PA—(Coke Dept)—A. D. Macfarlane, LaFollette, Tenn.
MGR (Coal Dept.)—G. M. Shoemaker, LaFollette, Tenn.
MGR (Coke Dept)—A. D. Macfarlane, LaFollette, Tenn.
MS—G. W. Card, " "
EM—A. D. Macfarlane, " "
SCO—LaFollette Stores Co. Buyer W. C. Malone, LaFollette, Tenn.
Coke ovens—293 Bee Hive.

Rex Mine; Slope; Coal Creek Seam; 36 to 48 in. thick. (Operate washery).
PO—La Follette, Tenn. SP—Same. CTY—Campbell. RR—Sou., L. & N., L. C. I. & Ry. Co., Branch.
MS—G. W. Card....La Follette, Tenn.
S of H—6 gasoline loco., mules and rope. Track gauge 36 in.
S of M—Hand.
PP—2 Erie return tubular boilers, total 300 H. P., 1 comp. and 1 pump.
EMP—375. Last fiscal year output 261,746 tons. 293 Bee Hive coke ovens.

Gem Mine; Drift Jordan Seam; 36 to 48 in. thick. Operate washery.
PO—Peabody, Tenn.; SP—Roosevelt, Tenn.; CTY—Campbell RR—L. & N.; Cinci. & Atlantic Br.
MS—J. E. Hendron,..LaFollette, Tenn.
S of H—4 Elec. loco.; track gauge 36 in.
S of M—2 elec. mach. and hand.
PP—2 Erie return tubular boiler, total 450 H. P., 2 gen. units, 275 volts D. C., 1 pump.
EMP—250. Last fiscal year output 112,773 tons.
Successors to LaFollette Coal, Iron & Ry. Company.

LITTLE BRUSHY COAL CO.
Mine worked out.

LUSK COAL MINING CO.
Atpontley No. 6 Mine; Drift; Sewanee Seam, 18 to 44 in. thick.
PO—Atpontley, Tenn; SP—College, Tenn. CTY—Bledsoe; RR—N. C. & St. L. Jasper Br.
PR—William G. Lusk...Atpontley, Tenn.
TR—H. M. Lusk, " "
GM—William G. Lusk, " "
PA—William G. Lusk, " "
MS—Robert Hage, " "
CE—M. G. Blackburn, " "
MM—T. W. Standefer, " "
SM—H. M. Lusk, " "
S of H—Mules and gravity.
S of M—Hand.
PP—Boiler 25 H. P., 1 air comp., 1 pump.
EMP—40. Output 30,000 tons.
Will sart in full in a few days; June 30.
Successors to the Finley Coal Co.

MINERSVILLE COAL CO.
Buck Mountain Mine.
PO—Pless, Tenn. CTY—Anderson.
MS—J. W. Groans.
State report.

MINGO COAL & COKE CO.
Mingo No. 5 Mine, Drift, Poplar Lick Seam, 52 in. thick.
PO—Hartranft, Tenn. SP — Mingo, Tenn. CTY—Claiborne. RR—L. & N., Sou.
PR—R. L. Ralston..Hartranft, Tenn.
PA—R. L. Ralston, " "
MS—Z. T. Ralston, " "
S of H—1 Elec. loco. and mules; track gauge 42 in.
S of M—6 comp. air mach. and hand.
PP—2 return tubular boilers, total 250 H. P., 1 gen. unit, 250 volts D. C., 1 comp. and 4 pumps.
EMP—60. Last fiscal year output 65,096 tons.

MONTLAKE COAL CO.
General Office, Chattanooga, Tenn.
Montlake Mine.
PO—Montlake, Tenn. SP—Same. CTY—Hamilton. RR—C. N. O. & T. P.
GM—G. F. Meehan Chattanooga, Tenn.
PA—P. A. Brawner, " "
EM—Thos. Dagnan ...Montlake, Tenn.
MS—George Dagnan, " "
SM—T. S. McGlahon, " "
S of H—Rope.
S of M—Hand.
PP—4 boilers, total 450 H. P.
(Old information.)

NEW CARYVILLE COAL CO.
Caryville Mine, Drift, Red Ash Seam, 42 in. thick.
PO—Caryville, Tenn. SP—Same. CTY—Campbell. RR—Southern.
PR—W. B. Croley..Williamsburg, Ky.
TR—Zeb Ward, " "
GM—G. G. Croley....Caryville, Tenn.
GS—G. G. Croley, " "
PA—G. G. Croley, " "
Asst M—J. L. Williams, " "
MS—J. W. Duncan, " "
EE—Jos. Gider, " "

SCO—New Caryville Coal Co. Buyer, Chas. C. Brown, Caryville, Tenn.
S of H—Mules and 3 elec. locos. Track gauge 36 in.
S of M—3 elec. mach.
PP—2 water tube boilers, total 200 H. P., 1 gen. unit, 250 volts D. C., 2 pumps.
EMP—200. Last fiscal year output 84-000 tons.

NEW ETNA COAL CO.

Etna Mine; Drift; Kelly Seam, 24 to 48 in. thick.
PO—Whiteside, Tenn.; SP—Etna Mines, Tenn.; CTY—Marion; RR—N. C. & St. L.
PR—S. R. Golibart...Washington, D. C.
GM—S. R. Golibart, Jr., Chattanooga, Tenn.
TR—J. V. Golibart, " "
PA—J. C. Hidgon.....Whiteside, Tenn.
MS—J. C. Foster, " "
MM—Wess Hicks, " "
SCO—New Etna Coal Co., Commissary, Buyer, J. C. Higdon, Whiteside, Tenn.
S of H—3 steam loco., mules and gravity.
S of M—Hand.
PP—5 water tube boilers, 1 compressor, 3 pumps.
EMP—200. Last fiscal year output 36,000 tons.

OLIVER COAL CO.

Out of business.

OVERTON COAL & COKE CO.

Overton Mine, Drift, "Bon Air No. 2" Seam, 4½ to 6 ft. thick.
PO—Davidson, Tenn. SP—Wilder, Tenn. CTY—Overton; RR—T. C.
PR—W. R. Officer....Livingston, Tenn
TR—Irving Allred.......Allred, Tenn.
GM—Irving Allred, " "
PA—P. M. Allred....Davidson, Tenn.
MS—P. M. Allred, " "
EM—O. P. Pile..........Cowan, Tenn.
SCO—Speck & Smith Bros. Buyer, F. M. Speck, Davidson, Tenn.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—1 boiler, total 16 H. P., 3 pumps.
EMP—27. Last fiscal year output, 12,000 tons.

PEACOCK COAL & COKE CO.

General Office, Lebanon, Pa.
Peacock No. 1 Mine, Drift, "Bon Air No. 2" Seam, 34 to 36 in. thick.
PO—Monterey, Tenn. SP—Same. CTY—Overton; RR—T. C., Crawford Branch.
PR—J. T. Odum.......Monterey, Tenn.
TR—J. C. Lusk ....Monterey, Tenn.
PA—J. C. Lusk, " "
MS—J. C. Lusk, " "
SM—J. C. Lusk, " "
S of H—Mules. Track gauge 36 in.
S of M—Hand.
Sales agent, J. C. Lusk, Monterey, Tenn
(Old information.)

PERKINS BRANCH COAL CO.

Perkins Branch Mine, Drift, "Blue Gem" Seam, 20 in. thick.
PO—Elk Valley, Tenn. SP—Same. CTY—Campbell. RR—Southern.
PR—J. F. Baird....Elk Valley, Tenn.
TR—F. M. Baird, " "
PA—F. M. Baird, " "
SM—F. M. Baird, " "
S of H—Mules. Track gauge 36 in.
S of M—Hand.
Last fiscal year output 3,000 tons.
(Old information.)

PETROS COAL MINING CO.

Petros coal Mng. Co. Mine; Drift; Brushy Mtn. Seam; 30 to 60 in. thick.
PO—Petros, Tenn. SP—Same. CTY—Morgan. RR—H. & N. E.
PR—A. H. Wood ......Petros, Tenn.
GM—A. H. Wood........Petros, Tenn.
PA—A. H. Wood, " "
MS—Ed. Johnson, " "
S of H—Rope, Gravity and 1 Gasoline loco.; track gauge 36 in.
S of M—Hand and 5 Comp. air mach.
PP—1 water tube boiler, total 150 H. P., 1 air comp., 2 pumps.
EMP—40. Last fiscal year output 19,970 tons.

PIEDMONT COAL & COKE CO.

Piedmont Mine; Drift; Coal Creek Seam, 24 to 144 in.
PO—Oliver Springs, Tenn.; SP—Khotan; CTY—Anderson; RR—L. & N., Cow Creek Br.
PR—E. F. Buffat. Oliver Springs, Tenn.
GS—E. F. Buffat, " "
MM—John W. Snoddy, Oliver Springs, Tenn.
TR—S. T. Buffat....Knoxville, Tenn.
SCO—Piedmont Store. Buyer, W. A. Boy, Oliver Springs, Tenn.
S of H—Mules and 2 elec. locos. Track gauge 36 in.
S of M—2 comp. air mach. and hand.
PP—2 return tubular boilers, total 230 H. P., 1 gen. unit, 250 volts D. C., 1 air comp. and 3 pumps.
EMP—75. Last fiscal year output 32,000 tons.
Sales agent, H. T. Hackney Coal Co., and Cherokee Coal Co., Knoxville, Tenn.

PROCTOR COAL CO.

1 Mine in Tennessee, 2 Mines in Kentucky.
Indian Mountain Mine, Drift Jellico Seam, 3½ ft. thick.
PO—Red Ash, Ky.; SP—Jellico, Tenn.; CTY—Campbell; RR—L. & N., Sou.
PR—Chas. Finley...Williamsburg, Ky.
GM—Chas. Finley, " "
TR—F. W. Finley, " "
GS—Philip Francis......Jellico, Tenn.
PA—Philip Francis, " "
EE—Thomas Francis, " "
EM—Louis Francis......Red Ash, Ky.
SM—George W. Davenport, " "
S of H—2 Elec. loco.; track gauge 40 in.
S of M—4 Elec. mach. and hand.
PP—Power from Central Station at Proctor Mine, 2 pumps.
EMP—200. Last fiscal year output 90,124 tons.

PRUDEN COAL & COKE CO.

General Office, Knoxville, Tenn.
Pruden Mine; Mingo Seam; 72 in. thick. operate washery.
thick; operate washery.
PO—Pruden, Tenn. SP—Same. CTY—Clairborne; RR—L. & N., Southern
PR—V. N. Hacker....Knoxville, Tenn.
TR—Joseph P. Gant...Knoxville, Tenn.
Asst GM—C. A. Griffith, Pruden, Tenn.
PA—Chas. Townsend, " "
SM—Chas. Townsend, " "
MS—R. C. Speaks, " "
MM—L. L. Page, " "
EE—D. G. Winchester, " "
EM—J. C. Richardson, Middlesboro Ky.
S of H—Mules and 8 Elec. loco.; track gauge 44 in.
S of M—Hand and 3 Elec. mach.
PP—4 Return tubular boilers, total 600 H. P., 2 gen. units, 2300 volts, A. C., 250 volts D. C., 3 phases and 60 cycles, 5 pumps.
EMP—200. Last fiscal year output 246,000 tons.

PRUDENTIAL COAL CO.

Prudential Mine, Drift, Coal Creek Seam 36 to 72 in. thick.
PO—Oliver Springs, Tenn.; SP—Same; CTY—Morgan; RR—Sou., Middlecreek branch.
PR—E. B. Booth..Oliver Springs, Tenn.
TR—J. L. Boyd......Knoxville, Tenn.
GM—J. L. Boyd, " "
PA—M. A. Duggins, Oliver Springs, Tenn.
GS—R. S. Davis...Oliver Springs, Tenn.
MS—R. S. Davis, " "
SCO—Prudential Coal Co. Store. Buyer, M. A. Duggins, Oliver Springs, Tenn.
S of H—Mules; track gauge 36 in.
S of M—Hand.
EMP—45. Last fiscal year output, 22,749 tons. Sales Agent, J. I. Boyd, Knoxville, Tenn.

RED ASH COAL CO.

Red Ash Mine; Drift; Red Ash Seam; 38 to 48 in. thick; operate washery.
PO—Caryville, Tenn.; SP—Red Ash, Tenn.; CTY—Campbell; RR—Southern; Castor Div.
PR—C. M. Moore......Caryville, Tenn.
TR—G. E. Moore, " "
GM—C. M. Moore, " "
PA—G. E. Moore, " "
MS—T. D. Richards, " "
GS—T. D. Richards, " "
MM—C. M. Andrews...Caryville, Tenn.
EE—C. M. Andrews, " "
CE—G. W. Wendling, " "
EM—G. W. Wendling, " "
SCO—Red Ash Coal Co. Buyer, G. E Moore.
S of H—5 elec. locos. and mules. Track gauge 42 in.
S of M—6 Elec. machines.
PP—Water tube boilers, total 300 H. P., 1 gen. unit, 2300 volts A. C., 250 D. C., 2 pumps.
EMP—150. Last fiscal year output, 75,000 tons.
Sales Agency, Red Ash Coal Co.

RED MOON COAL CO.

Old Hickory Mine; Drift; Jellico Seam, 34 to 36 in. thick.
PO—Morley, Tenn.; SP—Same; CTY—Campbell RR—L. & N.
PR—J. L. Hefferman.....Jellico, Tenn.
TR—S. B. Hefferman, " "
GM—Perry Cross, " "
PA—Chas. Hughes, " "
MS—D. F. Shuck, " "
EM—D. F. Shuck " "
SM—Chas. Hughes, " "
S of H—2 steam locos. and mules. Track gauge 36 in.
S of M—3 comp. air mach.
PP—1 Erie water tube boilers, 125 H. P.; 1 compressor, 3 pumps.
EMP—125.
Output, 3 cars per day.
Sales agency, Superior Coal Co.
Successors to the Hickory Creek Coal Co.

RELIANCE COAL & COKE CO.

Reliance Mines No. 1, 2 and 3; Drift; Mingo Seams, 60 in. thick.
PO—Hartranft, Tenn. SP—Same. CTY—Claiborne; RR—L. & N. and Sou.
PR—G. [illegible]. Whiteman....Phila., Pa.
TR—Daniel Cooper Swab. Hartranft, Tenn
GM—Daniel Cooper Swab, " "
GS—Daniel Cooper Swab, " "
PA—Daniel Cooper Swab, " "
EM—Malcolm Smith, " "
SM—A. H. Wright, " "
S of H—Rope; track gauge 36 and 42 in
S of M—Hand.
PP—Boilers, total 200 H. P.
EMP—200 to 250.

REMY COAL CO.

See Campbell Coal Mining Co.

RICH MOUNTAIN COAL & COKE CO.

General Office, Bennett, Tenn.
Rich Mountain Mine, Drift; Rich Mountain Seam; 32 in. to 48 in. thick.
PO—Bennett, Tenn.; SP—Habersham, Tenn.; CTY—Campbell; RR—L. & N., Knoxville Div.
PR—E. M. Beasley......Bennett, Tenn.
TR—E. M. Beasley, " "
GM—E. M. Beasley, " "
MS—E. M. Beasley, " "
PA—Chas. Stapleton, " "
SM—Chas. Stapleton, " "
S of H—Rope; track gauge 42 in.
S of M—Hand and 10 comp. air mach.
PP—3 Water tube boilers, total 180 H. P.; 2 compressors, 2 pumps.
EMP—150. Last fiscal year output 64,400 tons.
Sales Agency, Superior Coal Co.

ROYAL CONSOLIDATED COAL CO.

General Office, Knoxville, Tenn.
PR—H. S. Pless.......Knoxville, Tenn.
TR—H. H. Pless, " "
GM—Geo. P. Chandler, " "
EM—Geo. Wendling...Coal Creek, Tenn.
EE—H. D. Brock......Briceville, Tenn.
Sales Manager—F. J. Satterfield.

Tennessee Mine; Drift Coal Creek Seam, 42 to 54 in. thick.
PO—Briceville, Tenn.; SP—Same; CTY—Anderson; RR—Sou.
MS—J. W. Goans......Briceville, Tenn.
S of H—5 Elec. loco.; track gauge 36 in.
S of M— Hand.
PP—3 Return tubular boilers, total 300 H. P., 1 pump.
EMP—300. Last fiscal year ouput 100,000 tons.

Cambria Mine; Drift; Coal Creek Seam, 36 to 54 in. thick.
PO—Coal Creek, Tenn; SP—Same; CTY—Anderson RR—Sou.
MS—J. M. Stonecipher, Coal Creek, Tenn.
SM—C. C. Pless, " "
S of H—5 Elec. loco.; track gauge 36 in.
S of M—2 Elec. mach.
PP—3 Return tubular boilers, total 300 H. P., 1 gen. unit.
EMP—125. Last fiscal year output 50,000 tons.
Successors to Royal Coal & Coke Co.

SEWANEE FUEL & IRON CO.

General Office, Chattanooga, Tenn.
Coalmont Mine 5, Drifts, Sewanee Seam, 36 in. thick. Operate washery.
PO—Coalmont, Tenn.; SP— Same; CTY—Grundy; RR—N. C. & St. L., Cowan Branch.
PR—John E. Patton, Chattanooga, Tenn.
TR—John E. Patton, " "
GM—John E. Patton, " "
Secy—J. M. Adams, " "
GS—W. W. Jones......Coalmont. Tenn.
PA—W. W. Jones, " "
MS—W. W. Jones, " "
EM—George Cain, " "
MM—Clabe Parsons, " "
SCO—Sewanee Fuel & Iron Co. Buyer, Dave Henninger, Coalmont, Tenn.
S of H—1 gasoline loco. and mules. Track gauge 26 in.
S of M—Hand.
PP—2 Walsh & Weidner water tube boilers, total 120 H. P., 4 pumps.
EMP—254. Coke ovens, 90 Bee Hive. Last fiscal year output 140,000 tons. Sales Agent, G. W. Stephenson, Chattanooga, Tenn.

SIGNAL MOUNTAIN COAL CO.

General Office, Knoxville, Tenn.
Signal Mountain Mine; Drift; Coal Creek Seam, 42 in. thick.
PO—Oliver Springs, Tenn.; SP—Same; CTY—Morgan; RR—Sou.
PR—L. M. G. Baker, Knoxville, Tenn.
GM—L. M. G. Baker, " "
PA—L. M. G. Baker, " "
TR—Mr. Griffis, " "
GS—Sam Price, Oliver Springs, Tenn.
SCO—John Booth, " " "
S of H—Mules.
Sales Agency, L. M. G. Baker, Knoxville, Tenn.

SOUTHERN CLAY MFG CO.

General Office, Chattanooga, Tenn.
1 Mine in Tennessee and 1 Mine in Alabama.
Robbins Mine, Drift, Glen Mary Seam, 28 to 40 in. thick.
PO—Robbins, Tenn.; SP—Same; CTY—Scott; RR—Q. & C.
PR—W. M. Lasley, Chattanooga, Tenn.
TR—W. C. Brown, " "
PA—W. C. Brown, " "
GS—O. S. Adams, " "
Sales MGR—J. D. Harvey, " "
SUPT—John Ott.........Robins, Tenn
MS—Thomas Reynolds, " "
SM—J. F. Hargrove, " "
S of H—Mules and 2 steam locos.
S of M—3 elec. mach.
Mine coal for their own use.

SOUTHERN COAL & COKE COMPANY

General Office, Williamsburg, Ky.
Regal Mine, Drift; Jordon Seam; 42 to 54 in. thick.
PO—Gatliff, Tenn.; SP—Cotula, Tenn.; CTY—Campbell; RR—L. & N., Main line, Knoxville Division.
PR—A. Gatliff.....Williamsburg, Ky.
TR—E. C. Mahon....Knoxville, Tenn.
GM—N. B. Perkins..Williamsburg, Ky.
MS—A. V. Brown, " "
PA—L. F. Gatliff......Gatliff, Tenn.
SM—L. F. Gatliff, " "
CE—G. D. Cummings..Jellico, Tenn.
EM—G. D. Cummings, " "
S of H—Mules and 2 gasoline loco.; track gauge 36 in.
S of M—Hand.
EMP—150. Last fiscal year output 56,000 tons.
Sales Agent, address the Co.

STANDARD JELLICO COAL COMPANY.

Receiver, Chas. F. Eager, Clearfield, Tenn.
Standard Mine, Drift; "Jellico" Seam; 34 to 72 in. thick.
PO—Clairfield, Tenn.; SP—Same; CTY—Claiborne, RR—L. & N. & Sou.
PR—Chas. F. Eager..Clearfield, Tenn.
TR—Chas. F. Eager, " "
GM—Chas. F. Eager, " "
S of H—Mules; track gauge 42 in.
S of M—Hand.
EMP—150. Last fiscal year output 30,000 tons. Sales agent, Standard Jellico Coal Co.

STERLING COAL AND COKE CO.

Sterling Mine.
PO—Manring, Tenn.; SP—Middlesboro, Ky. CTY—Claiborne. RR—L. & N., Sou.
GM—C. S. McManus..Manring, Tenn.
PA—C. B. Finley, Jr., " "
MF—W. T. Robinson, " "
S of H—Elec. locomotives.
S of M—Hand and elec. machines.
PP—4 Boilers, 600 H. P., gen. unit, 250 volts D. C.
EMP—300.
(Old information.)

SUN COAL CO.

Sun Mine; Drift; Red Ash and Dean Seams, 30 to 72 in. thick.
PO—Caryville, Tenn.; SP—Same; CTY—Campbell; RR—Southern, K. & O. Branch.
PR—A. G. Hill.....Beaver Dam, Wis.
TR—M. A. Jacobs, " "
Secy—A. A. Fisher..Caryville, Tenn.
GM—J. H. Bowling, " "
GS—J. H. Bowling, " "
MS—W. L. Card, " "
PA—E. L. Guynes, " "
EM—Geo. Wendling, " "
MM—W. R. Bomar, " "
CE—Roy V. Myers.....Knoxville, Tenn.
EE—A. J. Summers.......Jellico, Tenn.
SCO—Sun Coal Co. Buyer, H. S. Russell, Caryville, Tenn.
S of H—2 elec. locos., rope, gravity and mules. Track gauge 36 in.
S of M—4 elec. mach. and hand.
PP—2 Walsh and Weidner return tubular boilers total 300 H. P., gen. unit, 2300 volts A. C., 3 phase, 60 cycles and 3 pumps.
EMP—225. Last fiscal year output 111,600 tons. Sales agency, Southern Coal & Coke Co., Knoxville, Tenn.

TENNESSEE COAL CO. (THE)

Tennessee and Middle Ridge Mines; Drifts; Coal Creek Seam.
PO—Briceville, Tenn.; SP—Coal Creek; CTY—Anderson; RR—Sou.
GM—Geo. P. Chandler. Knoxville, Tenn.
SM—Harry R. Smith...Briceville, Tenn.
S of H—Elec. locomotives.
S of M—Hand and comp. air machines.
PP—3 Boilers, 300 H. P., gen. units, 250 volts D. C., 1 comp.
EMP—150

TENNESSEE COAL, IRON & RAILROAD CO.

General Office, Birmingham, Ala.

1 Mine in Tenn., 20 Mines in Ala.

Whitwell Mine; Drift; Sewanee Seam, 40 in. thick.

PO—Whitwell, Tenn.; SP—Same; CTY—Marion; RR—N. C. & St. L.

PR—George G. Crawford, Birmingham, Ala.

TR—L. T. Beecher, " "

GM—F. H. Crockard, " "

PA—Geo. H. Gray, " "

SM—Geo. H. Gray, " "

CE—Robert Hamilton, " "

EM—W. A. Hamilton, " "

MM—Edwin Ball, " "

MS—W. A. Meagher, Whitwell, Tenn.

Chief Elec—A. F. Elliott, Ensley, Ala.

S of H—8 elec. loco.

S of M—Hand.

PP—Gen. units, 2300 volts A. C., 250 volts D. C., 3 pumps.

EMP—369. Coke ovens, 100 Bee Hive; Last fiscal year output, 261,105 tons.

Gen. Mgr. of Sales, F. A. Burr, Birmingham, Ala.

TENNESSEE CONSOLIDATED COAL CO.

Pryor Ridge, Reid Hill, and East Staub Mines; Drifts; Sewanee Seam, 22 to 60 in. thick.

PO—Tracy City, Tenn. SP—Same. CTY—Grundy; RR—N.C.& St.L.

PR—E. L. Hampton..Tracy City, Tenn.

GM—E. L. Hampton, " "

TR—G. M. Thorogood, " "

PA—C. E. Bryan, " "

GS—R. B. Roberts, " "

MS—R. B. Roberts, " "

EM—B. W. Faust, " "

MM—John Carrick, " "

SCO—Nunley Ridge Coal Co. Buyer, G. E. Bryan, Tracy City, Tenn.

S of H—2 gasoline locos. and mules. Track gauge 26 in.

S of M—Hand.

EMP—635. Coke ovens, 150 Bee Hive. Last fiscal year output 265,283 tons.

TENNESSEE-JELLICO COAL CO.

General Office, Knoxville, Tenn.

Anthras Mine, Drift, Jellico Seam 40 in. thick.

PO—Anthras, Tenn.; SP—Same; CTY—Campbell; RR—Southern & L. & N.

PR—Robert Wedekind....Louisville, Ky.

TR—W. G. Polk, " "

GM—L. I. Coleman..Knoxville, Tenn.

GS—John P. Gorman..Jellico, Tenn.

PA—J. L. Slusher, " "

SM—J. L. Slusher, " "

MS—Joe Smiddy, " "

EM—G. D. Cummings, " "

S of H—1 Gasoline loco.; track gauge 40 in.

S of M—10 Comp. air mach.

PP—1 Water tube boiler, 150 H. P., 1 compressor, 1 pump.

EMP—100. Last fiscal year output 50,000 tons.

TERRY COAL CO.

Oneida Mine; Drift; Seam 26 in. thick.

PO—Oneida, Tenn.; CTY—Scott.

Note—Suspended operation.

VASPER COAL MINING CO.

Vasper Mine; Slope; Coal Creak Seam, 44 in. thick.

PO—Vasper, Tenn.; SP—Same; CTY—Campbell; RR—Southern.

PR—C. P. Harley.

TR—C. P. Harley.

GM—T. C. Jacks, ...Knoxville, Tenn.

PA—T. C. Jacks, " "

CE—Meyers & Whaley, " "

S of H—Comp. air loco. and rope.

PP—1 Return tubular boiler, 100 H.P.

VIRGINIA MINING COMPANY (THE)

Roberta Mines, Drifts; No. 4 Seam, 36 in. thick.

PO—Roberta, Tenn. SP — Winfield, Tenn.; CTY—Scott; RR—C.N.O.& T. P.

PR—L. E. Bryant.....Roberta, Tenn.

GM—L. E. Bryant, " "

PA—L. E. Bryant, " "

EM—L. E. Bryant, " "

MS—Finley Reed and George Strunk, Roberta, Tenn.

TR—Dudley E. Bryant....Danville, Ky.

S of H—4 Elec. locos.; track gauge 36 in.

S of M—9 elec. mach.

PP—1 Wickes water tube boiler, total 400 H. P., 6 pumps.

EMP—200. Last fiscal year output 60,000 tons. Sales Agent, E. L. Bryant.

WHISTLE CREEK MINING COMPANY

General Office, Newcomb, Tenn.

Italian Mine; Drift; Italian Blue Gem Jellico & Fire Clay Seam; 28 to 38 in. thick.

PO—Newcomb, Tenn.; SP—Same; CTY—Campbell; RR—Southern, K. & O. Branch.

PR—Peter Zechini,.....Newcomb, Tenn.

TR—Thomas Zechini " "

GM—Thomas Zechini " "

GS—Thomas Zechini " "

PA—Peter Zechini " "

CE—D. C. Barker.......Jellico, Tenn.

EM—D. C. Barker " "

MM—Thomas Nunley....Newcomb, Tenn.

S of H—Mules; air and steam locos. Track gauge 36 in.

S of M—Punching machine.

PP—2 pumps.

EMP—65.

Sales Mgr.—Peter Zechini, Newcomb, Tenn.

WIND ROCK COAL & COKE CO.

General Office, 1312 American Trust Bldg., Birmingham, Ala.

Wind Rock No. 1 Mine, Drift, Dean Seam, 42 to 72 in. thick.

PO—Wind Rock, Tenn.; SP—Khotan, Tenn.; CTY—Anderson; RR—Louisville & Nashville, Cow Creek Br.

PR—H. L. Badham..Birmingham, Ala.

TR—R. E. Evans, " "

GS—W. C. Hutcheson.Wind Rock, Tenn.

PA—W. C. Hutcheson, " "

MS—T. M. Doyle, " "

SM—C. K. Goodson, " "

EM—F. J. Immler, " "

MM—W. F. Deadrick, " "

S of H—8 Elec. locos. and gravity; track gauge 42 in.

S of M—Hand and 5 Elec. chain mach.

PP—2 Sterling water boilers, total 300 H. P., 2 gen. units, 250 volts D. C., 4 pumps.

EMP—200. Last fiscal year output 140,723 tons.

WOOLDRIDGE JELLICO COAL CO.

General Office, Wooldridge, Tenn.

PR—P. Wooldridge, Pewee Valley, Ky.

TR—Jas.R.Wooldridge, Wooldridge,Tenn.

GM—Jas. R. Wooldridge, " "

GS—Wm. Dinkelaker, " "

PA—J. H. Queener, " "

SM—J. H. Queener, " "

MM—H. C. Douglass, " "

EE—S. M. Harris, " "

EM—B. L. Lloyd......Jellico, Tenn.

Sales Agent, Jas. R. Wooldridge, Wooldridge, Tenn.

Marion-Anna Mine; Drift; Jellico Seam, 2½ to 5 ft. thick.

PO—Wooldridge, Tenn.; SP—Newcomb, Tenn.; CTY—Campbell; RR—Sou., Coster Div.

MS—T.H.Griffiths, Wooldridge, Tenn.

SM—W. F. Goins, " "

S of H—Elec. loco. and mules; track gauge 39 in.

S of M—Hand.

PP—250 volts D. C.

EMP—125. Last fiscal year output 50,000 tons.

Washington Mine; Drift; Blue Gem Seam; 18 to 30 in. thick.

PO—Wooldridge, Tenn.; SP—Newcomb, Tenn.; CTY—Campbell; RR—Sou., Coster Div.

MS—John C. Bates..Wooldridge, Tenn.

S of H—Mules; track gauge 39 in.

S of M—Hand.

EMP—70.

WYNN COAL CO.

Drift Mine; Rich Mtn. Seam, 36 to 44 in. thick.

PO—Gatliff, Tenn.; SP—Gotula, Tenn., CTY—Campbell. RR—L. & N.

PR—A. J. Jones........Gatliff, Tenn.

TR—J. H. Tinsley, " "

GM—J. K. Orr, " "

MS—J. H. Wynn, " "

SM—Wynn Store Co.,

S of H—2 Elec. loco.; track gauge 40 in.

S of M—4 Elec. mach.

PP—Gen. units, 250 volts D. C., boiler, 160 H. P.

EMP—90. Last fiscal year output, 50,000 tons.

TEXAS

For List of Abbreviations See Page 622.

ALBA-MALAKOFF LIGNITE CO.

General Office, Dallas, Tex.

PR—Jos. Samuels, ... Dallas, Tex.

TR—H. J. Maersch, " "

GM—H. J. Maersch, " "

PA—H. J. Maersch, " "

EM—W. O. Clark, ..Greenville, "

Nos. 1, 3 and 5 Mines; Shafts and Slope, Alba Lignite Seams, 6 to 12 ft. thick.

PO—Alba, Tex. SP—Lignite Spur. CTY—Wood. RR—M. K. & T., Mineola Banch.

MS—T. M. Reavley,.........Alba, Tex.

S of H—Mules and rope. Track gauge 36 in.

S of M—Hand.

PP—1 Atlas water tube and 1 Ames return tubular boiler, total 200 H. P., 2 pumps.

EMP—40 to 50. Last fiscal year output 49,129 tons.

No. 2 and 4 Mines; Shafts; Malakoff Lignite Seam, 6 to 8½ ft. thick.

PO—Malakoff, Tex. SP—Same. CTY—Henderson. RR—St. Louis & Southwestern, Main Line.

MS—T. M. Reavley........Alba, Tex.

S of H—Mules. Track gauge 36 in.

S of M—Hand.

PP—1 return tubular boiler, total 100 H. P., 2 pumps.

EMP—60 to 75. Last fiscal year output 13,884 tons.

AMERICAN LIGNITE BRIQUETTE CO.

Big Lump No. 5 Mine; Shaft; No. 5 Seam, 6 to 12 ft. thick.

PO—Big Lump, Tex. SP—Same. CTY—Milam. RR—I. & G. N., Main Line.

PR—C. T. Priest, ...San Antonio, Tex.

TR—J. J. Stevens, " "

GM—H. C. Koehler, " "

PA—A. C. Koehler, .. Big Lump, "

MS—A. C. Koehler, " "

SCO—Big Lump Trading Co. Buyer A. C. Koehler, Big Lump, Tex.

S of H—Mules and 2 elec. loco. Track gauge 30 in.

S of M—Hand and 4 compressed air machines.

PP—3 Casey & Hedges water tube boilers, total 400 H. P., 2 gen. units 250 volts D. C., 1 air compressor, 8 pumps.

EMP—125. Last fiscal year output 85,430 tons.

ATHENS LIGNITE COMPANY

Athens Lignite Co. Mine; 90 to 162 in. thick.

PO—Malakoff, Texas SP—Athens, Texas; CTY—Henderson; RR—Cotton Belt.

PR—Claude Wiley.........Tyler, Texas

TR—J. F. Gilmore......Athens, Texas.

GM—C. B. Richburg....Malakoff, Texas

S of H—Mules.

BASTROP COAL CO.

Denison and Titantic Mines; Shafts; Bastrop Seam; 102 to 120 in. thick.

PO—McDade, Tex. SP—Glenham, Tex. CTY—Bastrop. RR—M. K. & T. Smithville, Br.

PR—F. L. Denison......McDade, Tex.

GM—F. L. Denison.....McDade, Tex.

PA—F. L. Denison, " "

EM—F. W. Denison, " "

MM—D. A. Evans, " "

MS—Victor, Civalerni " "

MS—Martin Unbiltski, " "

SM—R. J. Meyers, " "

TR—C. A. Hughes........Temple, Tex.

S of H—Mules. Track gauge 30 in.

S of M—Hand.

PP—2 Return tubular boilers, total 150 H. P., and 2 pumps

EMP—115. Last fiscal year output, 85,000 tons.

BEAR GRASS COAL CO.

General Office, Jewett, Tex.

Bear Grass Shaft Mine, No. 2, Shaft, Lignite Seam, 9 ft. thick.

PO—Newby, Tex. SP—Same. CTY—Leon. RR—T. & B. V. Ry. Co.. Bear Grass Spur.

PR—A. D. Evans, Fort Worth, Tex.

VP—W. G. Bartels, ..Carlinville, Ill.

GM—H. B. Crosby, ... Jewett, Tex.

PA—H. B. Crosby, " "

MS—C. M. Ballard, " "

EM—C. M. Ballard, "

SCO—Bear Grass Merc. Co., Buyer, T. G. Buchanan, Jewett, Tex.

S of H—Mule and rope. Track gauge 36 in.

S of M—Hand.

PP—2 pumps. Boilers, total 110 H. P.

EMP—60. Last fiscal year output 41,715 tons.

BELKNAP COAL CO.

Mine No. 4 and 5; Shafts; No. 7 Seam; 38 to 50 in. thick.

PO—New Castle, Tex. SP—Same. CTY—Young. RR—W. F. & Southern Ry.

PR—J. J. Perkins, Witchita Falls, Tex.

TR—J. J. Perkins, " "

GM—W. F. Nance...New Castle, Tex.

GS—W. F. Nance, " "

PA—W. F. Nance, " "

EM—B. W. Smittem, " "

MM—B. W. Smittem, " "

S of H Mules and 1 elec. mach. Track gauge 34 in.

S of M—Hand.

PP—2 Return tubular boilers, total 240 H. P., 1 air comp., 1 pump.

EMP—200. Last fiscal year output 75,374 tons.

BRIDGEPORT COAL COMPANY.

Mines Nos. 2 and 3, Shafts, Seams 18 to 22 in. thick.

PO—Bridgeport, Tex. SP—Same. CTY—Wise. RR—C. R. I. & G.

PR—W. H. Aston, Meadow View, Va.

GM—W H. Aston, " "

TR—W. H. John, .. Bridgeport, Tex.

GS—W. H. John, " "

EM—W. H. John, " "

PA—E. T. Bingham, " "

SM—E. T. Bingham, " "

MS—No. 2, T. J. McAfee, " "

MS—No. 3, Tommy Byrnes, " "

EE—W. H. Lane, " "

S of H—Mules. Track gauge 30 in.

S of M—Hand.

PP—5 Return tubular boilers, total 480 H. P., 1 gen. unit, 250 volts D. C., 4 pumps.

EMP—226. Last fiscal year output, 57,991 tons.

CALVIN COAL CO.

Calvin Mines No. 1 and 2; Upper and Lower Lignite Seam; 72 to 116 in. thick.

PO—Calvin, Tex. SP—Same. CTY—Bastrop. RR—M. K. & T.

PR—W. C. Sillimon..San Antonio, Tex.

GM—W. C. Sillimon, " "

TR—C. S. Austin, " "

MS—John Waugh ....Calvin, Tex.

S of H—Mules. Track gauge 30 in.

S of M—Hand.

PP—1 boiler, total 125 H. P., 2 pumps.

EMP—50. Last fiscal year output 32,000 tons.

CANNEL COAL CO.

General Office Laredo, Texas.

PR—C. B. Wright....Philadelphia, Pa.

Asst—E. F. Wager ......Laredo, Tex.

PA—E. F. Wager, "

TR—H. G. DaCamara, " "

GS—D. D. Davis ......Dolores, Tex.

EM—R. W. Davis, " "

MM—R. DeWolff, " "

EE—R. DeWolff, " "

Sales agent, E. F. Wager, Laredo, Tex.

Darwin Mine; Shaft; "San Pedro" Seam; 20 to 24 in. thick.

PO—Dolores, Tex.; SP—Same; CTY—Webb; RR—Rio Grande & Eagle Pass.

MS—R. W. Davis......Dolores, Tex.

SM—Thos. Worsham ....Darwin, Tex.

S of H—Mules and 4 gasoline locos Track gauge 36 in.

S of M—Hand.

PP—4 return tubular boilers, total 240 H. P., 1 air comp., 10 pumps.

EMP—207. Last fiscal year output, 44,646 tons.

Dolores Mine; Shaft; "Santo Tomas" and "San Pedro" Seam; 20 to 28 in. thick.

PO—Dolores, Tex. SP—Same. CTY—Webb. RR—Rio Grande and Eagle Pass.

MS—R. W. Davis........Dolores, Tex.

SM—John Loftus, " "

S of H—Mules, 1 elec. and 1 gasoline loco. Track gauge 36 in.

S of M—Hand and 2 Elec. mach.

PP—1 water tube, 3 return tubular boilers, total 1750 H. P., 1 gen. unit, compressor and 13 pumps.

EMP—280. Last fiscal year output, 64,755 tons.

CARR COAL CO.
General Office San Antonio, Tex.
PR—R. W. Carr......San Antonio, Tex.
EM—R. W. Carr, " "
PA—R. W. Carr, " "
TR R W. Carr. " "
GM—T. F. Smith, " "
GS—D. Buniva, R. R. 2, McDade, Tex.
CE—R. W. Carr San Antonio, Tex.
MM—T. F. Smith ......McDade, Tex.
SCO—Evergreen Commissary, Buyer, R. Buniva, R. R. 2, McDade, Tex.

Carr Shaft No. 1 Mine, Shaft, 42 to 60 in. thick.
PO—R. R. No. 2, McDade, Tex.; SP—Glenham, c|o Phelan, Tex.; CTY—Bastrop; RR—M. K. & T.
S of H—Mules; track gauge 23 in.
S of M—Hand.
PP—1 return tubular boiler, 100 H. P., 2 engines.
EMP—100. Last fiscal year output 39,806.04 tons.

COMO LIGNITE MINING CO.
Out of business.

CONSUMERS LIGNITE CO.
Nos. 7, 8, and 9 Mines; Slope, Seam 72 to 108 in. thick.
PO—Hoyt, Texas; SP—Same; CTY—Wood; RR—T. S. L., M. K. & T., Mincola Div.
PR—Lucia E. Blount, Washington, D. C.
TR—C. Lee Ordeman.......Hoyt, Tex.
GM—C. Lee Ord man, " "
PA—C. Lee Ordeman, " "
GS—R. H. Chaney, " "
EM—R. H. Franks.........Alba, Tex.
MM—R. H. Franks.........Alba, Tex.
EE—R. E. Reid, " "
SCO—Address the Company " "
S of H—1 Steam, 1 gasoline loco. and and mules; track gauge 30 in.
S of M—5 comp. air mach.
PP—5 return tubular boilers, total 500 H. P., 1 gen. unit, 250 volts D. C., 1 compressor, 9 pumps.
EMP—130. Last fiscal year output 92,578 tons.

DENISON, F .L.
PR—F. L. Denison......McDade, Tex.
TR—F. L. Denison, " "
GM—F. L. Denison, " "
PA—F. L. Denison, " "
EM—F. W. Denison, " "
MM—J. G. Jacks, " "
Sales Agency, Bastrop Lignite Coal Co.

Belto Mine Slope; Bastrop Seam, 42 to 66 in. thick.
PO—McDade, Tex.; SP—Biglo, Tex.; CTY—Bastrop; RR—M. K. & T., Smithville Br.
MS—John Belto........Bastrop, Tex.
S of H—Mules; track gauge 30 in.
S of M—Hand.
PP—1 Atlas return tubular boilers, 120 H. P., 4 pumps.
EMP—75. Last fiscal year output 30,000 tons.

Sayers Mine; Slope, Bastrop Seam, 125 to 144 in. thick.
PO—McDade, Tex.; SP—Sayers, Tex; CTY—Bastrop; RR—M. K .& T., Smithville Br.
MS—J. G. Jacks........McDade, Tex.
S of H—Mules. Track gauge 36 in.
PP—1 Atlas return tubular boiler 75 H. P.

DODD, W. C. LIGNITE COMPANY
Slope Mine; Lignite Seam; 162 in. thick.
PO—Malakoff. Texas; SP—Tredlow, Texas; CTY—Henderson; RR—St. Louis S. W. of Texas.
PR—W. C. Dodd........Malakoff, Tex.
GM—W. C. Dodd, " "
GS—W. C. Dodd, " "
PA—W. C. Dodd, " "
S of H—Mules; 1 steam loco., track gauge 30 in.
S of M—Hand.
PP—1 steam boiler; total 75 H. P.
EMP—40. Last fiscal year output 28,000 tons.

HOUSTON COUNTY COAL & MFG. CO.
General Office, Crockett, Tex.
PR—G. Q. King ......Crockett, Tex.
GM—G. Q. King, " "
PA—G. Q. King, " "
TR—John LeGory, " "
EM—Davis Crow ....Crockett, Tex.
Sales agency, John LeGory, Crockett, Tex.

Wooters No. 4 Mine; Shaft; Yequa Seam, 60 to 72 in. thick.
PO—Lovelady, Tex.; SP—Wootters, Tex.; CTY—Houston. RR—Inter. and Great Northern.
MS—W. E. Elkins......Lovelady, Tex.
S of H—Mules and 1 gasoline loco. Track gauge 36 in.
S of M—Hand.
PP—1 return tubular boiler, total 100 H. P., 1 compressor and 1 pump.
EMP—85. Last fiscal year output, 73,188 tons.

Evansville No. 3 Mine; Shaft; Sapine or Lignite Seam; 96 to 108 in. thick.
PO—Evansville, Tex. SP—Same. CTY—Leon; RR—Houston & Tex. Con., Mexia-Nellava Cut Off.
MS—W. Q. Lundy ....Evansville, Tex.
SM—W. Q. Lundy, " "
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—2 return tubular boiler, 200 H. P., 2 pumps.
EMP—90. Last fiscal year output, 63,359 tons.

INDEPENDENCE MINING CO.
Mines Nos. 2 and 3; Shaft; No. 1 Seam; 48 to 72 in. thick.
PO—Phelan, Tex.; SP—Same; CTY—Bastrop; RR—M. K. & T.
PR—J. C. Phelan, ...Phelan, Tex.
GM—J. C. Phelan, " "
TR—Iago Meusebach, " "
PA—Iago Meusebach, " "
GS—Hunter C. Phelan, " "
EM—Hunter C. Phelan, " "
MM—C. G. Swenson, " "
SCO—Phelan Merc. Co., " "
S of H—Mules.
S of M—Hand.
PP—Atlas boilers, total 600 H.P.
Sales Agent, C. G. Meuscbach, San Antonio, Tex.

INTERNATIONAL COAL MINES CO.
Receiver, L. B. Leighton, Eagle Pass, Tex.
Shaft Mine; 65 to 84 in. thick
PO—Eagle Pass, Tex.; SP—Dolchburg, Tex.; CTY—Maverick; RR—G. H. & S. A.
GM—L. B. Leighton ..Eagle Pass, Tex.
PA—L. B. Leighton....Eagle Pass, Tex.
MS—L. B. Leighton, " "
MM—A. Davis, " "
SCO—International Coal Mines Co. Store. Buyer, L. B. Leighton, Eagle Pass, Tex.
S of H—Mules and rope.
S of M—Hand and comp. air mach.
PP—6 boilers, total 520 H. P., 1 air comp., 1 pump.
EMP—21. Last fiscal year output 20,000 tons.

KELLY LIGNITE COMPANY
Black Diamond Mine; Shaft; 72 in. thick.
PO—Como, Texas; SP—Same; CTY—Hopkins; RR—M. K. & T.
GM—Jeff Kelley..........Como, Texas
CE—Jeff Kelley, " "
EM—Jeff Kelley, " "
SM—C. E. Smith, " "
S of H—Mules.
S of M—Hand.
PP—1 pump.
EMP—20.

LIBBY MFG. CO.
Nodena Lignite Mine, Slope, 72 to 108 in. thick.
PO—Mt. Pleasant, Tex. SP—Nodena. CTY—Titus. RR—Cotton Belt.
PR—L. C. Libby...Mt. Pleasant, Tex.
PA—L. C. Libby, " "
GM—L. C. Libby, " "
TR—Mrs. L. C. Libby, " "
MS—Roger Harbour, " "
SCO—Address the Co.
S of H—Mules and rope. Track gauge 36 in.
S of M—Hand.
PP—1 return tubular boiler, total 60 H. P.
EMP—25. Last fiscal year output 16,000 tons.

LOVING COAL COMPANY
General Office, Loving, Texas.
Sallie Alice Mine; Slope; 22 to 32 in. thick.
PO—Loving, Texas; SP—Same; CTY—Young; RR—G. T. & W.
PR—W. E. Forgy, Archer City, Texas.
TR—W. L. Andrews, " "
S of H—Mules and steam loco.
S of M—Hand.
PP—1 pump.
Note—Successors to Sallie-Alice Mining Co.

LOWER STRATA LIGNITE MINING CO.
Lower Strata Mine, Shaft.
PO—Ledbetter, Tex.; SP—Same; CTY—Fayette, RR—H. & T. C.
PR—T. T. Felder......Giddings, Tex.
TR—T. T. Felder, " "
GM—T. T. Felder, " "
PA—T. T. Felder, " "
MS—T. T. Felder, " "
MM—Theodore Troll....Ledbetter, Tex.
S of H—Mules.
S of M—Hand.
PP—Boiler 60 H. P.
EMP—20. Last fiscal year output 75,000 tons.
Sales Agent, T. T. Felder Giddings, Tex.

McKAY LIGNITE MINING CO.
General Office, Dallas, Tex.
Lone Star No. 2 Mine, Shaft, Seam 6 ft. thick.
PO—Como, Tex. SP—Same. CTY—Hopkins. RR—M. K. & T.
PR—J. C. McKay ......Dallas, Tex.
GM—J. C. McKay, " "
TR—H. J. McKay, " "
MS—D. L. Jernigan ......Como, Tex.
S of H—Mules.
S of M—Hand.
PP—1 return tubular boiler, total 100 H. P.
EMP—30. Last fiscal year output 35,000 tons.
Sales agent, McKay Coal Co., Dallas, Tex
(Old information.)

OLMOS COAL CO.
Larmar Mine, Shaft, "Semi-bituminous" Seam, 6 to 8 ft. thick. Operate washery.
PO—Eagle Pass, Tex. SP—Same. CTY—Maverick. RR—G. H. & S.A.
PR—Ernesto Madero, 115 Broadway, New York.
GM—L. M. Larmar, 1601 Main ave., San Antonio, Tex.
S of H—Mules. Track gauge 3 ft.
S of M—Hand.
PP—4 water tube boilers, total 300 H. P.
EMP—150. Last fiscal year output 24,000 tons.
(Old information.)

ROCKDALE COAL CO.
Rockdale, Texas. No report.

ROCKDALE LIGNITE COMPANY.
Witcher Mine; Shaft & Slope; 96 to 168 in. thick.
PO—Rockdale, Tex SP—Same; CTY—Milam; RR I. & G. N. Witcher Speer Branch.
PR—J. P. Sparks, .. Rockdale, Tex.
GM—J. P. Sparks, " "
PA—J. P. Sparks, " "
TR—Isaac M. Sparks, " "
GS—S. D. Yoakum, " "
MS—S. D. Yoakum, " "
CE—S. D. Yoakum, " "
SCO—International Commissary, Buyer, Fred Jangessen, Rockdale, Texas.
S of H—Mules & 2 steam locos.
S of M—Hand.
PP—2 Return tubular Boilers, 1 pump.

SANTO TOMAS COAL CO.
General Office, Laredo, Texas.
Santo Tomas Mine, Shaft, Santo Tomas Seam, 30 to 40 in. thick.
PO—Santo Tomas; SP—Minera; CTY—Webb. RR—R. G. & E. P.
PR—Albert Urbahn.......Laredo, Tex.
TR—M. L. Cogley, " "
PA—Harry Johnson, " "
GM—George Derby, " "
EM—A. C. Pudewa,...Santo Tomas, Tex.
GS—P. L. Mathews, " "
MS—P. L. Mathews, " "
MM—T. C. Hayes, " "
EE—T. C. Hayes, " "
SCO—Santo Tomas Store. Buyer Chas. D. Bragg, Santo Tomas, Tex.
S of H—Mules, and 2 steam locos. Track gauge 30 in.
S of M—Hand, and 2 elec. mach.
PP—2 return tubular boilers, total 250 H. P., 1 gen. unit, 2,200 volts A. C., 3 phase, 60 cycles, 1 pump.
EMP—300. Last fiscal year output 31,000 tons.
Sales agent, J. R. Smith, Laredo, Tex.

SOUTHWESTERN FUEL CO.
General Office, 1810 Amicable Bldg., Waco, Tex.
No. 1 Mine; Shaft; Lower Seam; 166 in. thick.
PO—Calvert, Tex.; SP—Same; CTY—Robertson; RR—I. & G. N.
PR—A. C. Burke..........Waco, Tex.
TR—A. C. Burke, " "
GM—A. C. Burke, " "
PA—A. C. Burke, " "
MS—R. M. Waugh......Calvert, Tex.
CE—Wm. E. Anderson......Dallas, Tex.
S of H—Elec. loco.; track gauge 24 in.
S of M—Hand.
PP—3 Water tube boilers, total 300 H.P., gen. unit, 220 volts D. C., and 5 pumps.
EMP—250. Last fiscal year output, 130,000 tons.

STRAWN COAL CO.
General Office, Strawn, Texas.
PR—W. Burton .....Fort Worth, Tex.
TR—A. Deffebach, " "
GM—J. H. McLure .....Strawn, Tex.
PA—J. H. McLure, " "
EM—M. C. Johnson......Strawn, Tex.
GS—J. Halifax............Lyra, Tex.
EE—Ira Hensley, " "
MM—A. Waugh, " "
SCO—Strawn Mdse Co. Buyer, W. S. Warren, Strawn, Tex.
Sales agent, address the Co., at Strawn, Tex.

Mt. Marion Mine; Shaft; Seam 26 to 30 in. thick.
PO—Strawn, Tex. SP—Same. CTY—Palo Pinto. RR—Texas & Pac.
MS—B. Brookman........Strawn, Tex.
S of H—Mules and 3 storage battery loco.; track gauge 30 in.
S of M—Hand.
PP—3 return tubular boilers, total 240 H. P., 1 gen. unit, 1,100 volts A. C., 30 cycles, 1 air comp., 1 pump.
EMP—324. Last fiscal year output 87,954 tons.

Mine No. 2. Shaft, Strawn Seam 24 to 30 in. thick.
PO—Lyra, Tex. SP—Strawn, Tex. CTY—Palo Pinto. RR—Tex & Pac.
MS—W. McKinnon..........Lyra, Tex.
S of H—Mules. Track gauge 30 in.
S of M—Hand.
PP—4 Return tubular boiler, total 320 H. P., 1 pump.
EMP—287. Last fiscal year output 70,055 tons.

TEXAS COAL CO.
No. 1 Mine; Lignite Seam; 72 to 120 in. thick.
PO—Rockdale, Tex.; SP—Septimo, Tex.; CTY—Milam; RR—I. & G. N.
PR—H. C. Meyer ...Rockdale, Tex.
TR—E. B. Phillips.....Rockdale, Tex.
GM—C. K. Stribling, " "
GS—C. K. Stribling, " "
PA—C. K. Stribling, " "
SCO—Texas Coal Co. Commissary. Buyer, C. K. Stribling, Rockdale, Tex.
S of H—Mules and rope. Track gauge 30 in.
S of M—Hand.
PP—2 return tubular boilers total 200 H. P., 3 pumps.
EMP—75. Last fiscal year output 75,000 tons.

TEXAS & PACIFIC COAL CO.
Shaft Mine.
PO—Thurber, Tex.; SP—Mingus, Tex.; CTY—Erath; RR—T. & Pac.
PR—Edgar L. Marston, 24 Broadway, New York, N.Y.
TR—Edgar L. Martson, 24 Broadway, New York, N.Y.
GM—W. K. Gordon, ...Thurber, Tex.
SCO—Texas Pacific M. & M. Co.
S of H—Elec. Loco.
S of M—3 Elec. mach. and hand.
EMP—2,000. Last fiscal year output 745,360 tons.
(Old information.)

VOGEL COAL & MFG. COMPANY.
General office, Rockdale, Tex.
Vogel Mine; Shaft; 54 to 90 in. thick.
PO—Rockdale, Tex.; SP—Same; CTY—Milam; RR—I. & G. N.
PR—Gus Vogel,.......Rockdale, Tex.
TR—Gus Vogel, " "
GM—Gus Vogel, " "
GS—Gus Vogel, " "
PA—Gus Vogel, " "
MS—Gus Lorenz, " "
S of H—Mules.
S of M—Hand.
PP—1 Boiler, total 35 H. P., 1 gen. unit.
EMP—25. Last fiscal year output, 15070 tons.

WISE COUNTY COAL CO.
Slope Mine; Seam 18 in. thick.
PO—Bridgeport, Tex.; SP—Same; CTY—Wise; RR—C. R. I. & P.
PR—A. J. Clendenur....Bridgeport, Tex.
GM—A. J. Clendenur, " "
TR—J. G. Short, " "
MS—H. Hardy, " "
S of H—Mules.
S of M—Hand.
PP—1 Return tubular boiler, 80 H. P.
EMP—35. Last fiscal year output 1,200 tons.

UTAH

For List of Abbreviations See Page 622.

AMERICAN FUEL CO
General Office, Salt Lake City, Utah.
Neslen Mine; Drift; Book Cliff Seam; 64 to 108 in. thick.
PO—Neslen, Utah; SP—Thompson, Utah; CTY—Grand; RR—D. & R. G., B. & T. Branch.
PR—Wm. Spry....Salt Lake City, Utah
TR—R. F. Neslen, Salt Lake City, Utah.
GS—H. M. Henderson......Neslen, Utah
PA—F. E. Kleinschmidt, Salt Lake City, Utah.
MS—W. J. Hillabrant....Neslen, Utah
EM—W. J. Hillabrant, " "
MM—J. A. Ecton, " "
EE—J. A. Ecton, " "
SCO—Neslen Mercantile Company, Neslen, Utah. Buyer, G. E. Brown, Neslen, Utah.
S of H—2 Gasoline loco.; track gauge, 42 in.
S of M—4 Elec. Mach.
PP—2 Erie City return tubular boilers, total 160 H. P., 2 gen. units, 250 volts D. C., 2300 volts A. C., 3 phase, 60 cycles, and 4 pumps.
EMP—300. Last fiscal year output 116,910 tons.

ANDERSON, AXEL L.
Rock Canyon Mine, Drift, Seam 10 ft. thick.
PO—Clawson, Utah; **CTY—Emery.**
PR—Axel L. Anderson..Clawson, **Utah**
S of H—Gravity track gauge 39 in.
S of M—Hand.

ANDERSON COAL COMPANY.
Anderson Mine; Drift; White Ledge Coal Seam; 12 to 14 ft. thick.
PO—Orangeville, Utah; SP—Price; CTY—Emery; RR—D. & R. G.
PR—Geo. Sitterud....Orangeville, Utah
TR—O. J. Sitterud, " "
S of H—Mules.
S of M—Hand.
Output 700 tons.

BURTON BROS.
Burton Mine; Slope; 42 in. thick.
PO—Vernal, Utah; CTY—Unita.
S of H—Mules.
Last fiscal year output 20 tons.

CAMERON COAL COMPANY
General Office, Salt Lake City, Utah.
Cameron Mine; Drift; 60 to 180 ins. thick.
PO—Castle Gate, Utah; SP—Same; CTY—Carbon; RR— D. & R. G.
PR—M. S. Browning, Salt Lake City, Utah.
TR—Marriner Browning, Salt Lake City, Utah.
GM—E. S. Rolapp, " "
PA—A. E. Hadley, " "
CE—Charles Leger, ..Castle Gate, Utah
GS—Thomas Bell.....Castle Gate, Utah.
MS—Thomas Bell, " "
MM—W. O. Maulsby, " "
EE—W. O. Maulsby, " "
SM—J. M. Hixson, " "
SCO—Cameron Store Co. " "
S of H—Mules and rope.
S of M—8 elec. mach.
PP—3 return tubular boilers, 440 volts A. C., 3 phases, 60 cycles, 1 pump. Purchase power.
EMP—100. Last fiscal year output 100,000 tons. Sales Agency, Cameron Coal Co., Salt Lake City, Utah.

CARBON FUEL CO.
General Office, New House Bldg., Salt Lake City, Utah.
PR—L. F. Rains, Salt Lake City, Utah
MS—W. T. Harris, " "
Mine located at Rains, Carbon County, Utah. No report.

COVE CREEK COAL CO.
Coal Creek Mine; Slope; 60 to 72 in. thick.
PO—Gunnison, Utah; SP—Sterling; CTY—Sampete; RR—Sampete.
PR—M. Beauregard....**Gunnison, Utah.**
TR—S. M. Duggins......Gunnison, Utah
GM—S. M. Duggins, " "
PA—S. M. Duggins, " "
GS—M. M. Duggins, " "
MS—S. J. Duggins, " "
SCO—Address the Co. Buyer, S. M. Duggins, Gunnison, Utah.
S of H—Mules.
Note—Closed at present.

CRYSTAL COAL COMPANY
Crystal Mine; Drift; Castle Gate Vein; 48 to 72 in. thick.
PO—Ogden, Utah; SP—Helper, Utah; CTY—Weber; RR—D. & R. G.
PR—W. I. Norton........Ogden, Utah
GM—W. I. Norton, " "
GS—W. I. Norton, " "
CE—B. S. Lacy, " "
EM—B. S. Lacy, " "
TR—Frank Pingree,.....Coalville, Utah
S of H—Gravity.

GILSON ASPHALTUM CO.
General Office, Philadelphia, Pa.
Two mines in Utah; 1 in Colorado.
PR—Arthur W. Sewell..Philadelphia, Pa.
TR—Ira Atkinson, " "
GM—M. W. Cooley........Mack, Colo.
GS—Homer D. Ford,.....Watson, Utah
PA—Homer D. Ford, " "
EM—Homer D. Ford, " "
SM—Homer D. Ford, " "
Rainbow Mine; Shaft; Gilsonite Vein; 96 to 144 in. thick.
PO—Watson, Utah; SP—Same, c|o Rainbow Mine; CTY—Uinta; RR—Uinta.
S of H—Mules. Track gauge 30 in.
S of M—Hand.
EMP—32. Last fiscal year output 13,490 tons.

Bonanza Mine; Shaft Gilsonite Vein; 60 to 96 in. thick.
PO—Watson, Utah; SP—Same, c|o Bonanza; CTY—Uinta; RR—Uinta.
S of H—Mules.
EMP—5. Last fiscal year output 1,500 tons.

HARMONY COAL CO. Inc. (THE)
Nos. 2 and 4 Tunnel Mines; Colorado Group Cretaceous Seam; 48 to 111 in. thick.
PO—New Harmony, Utah; SP—Lund; CTY—Washington; R. R.—S. P. L. A. & St. L.
PR—I. L Shaffer.........Chicago, Ill.
TR—I. L. Shafer, " "
VP—R. A. Kirker ..New Harmony, Utah
GM—R. A. Kirker, " "
PA—R. A. Kirker, " "
MS—R. A. Kirker, " "
S of H—Mules.
S of M—Hand.
EMP—2 to 5.

INDEPENDENT COAL & COKE CO.
General Office, Walker Bank Bldg., Salt Lake City, Utah.
Aberdeen Coal Mine Slope Seam, 17 to 22 ft. thick.
PO—Kenilworth, Utah; SP—Same; CTY—Carbon; RR—Denver & Rio Grande, Kenilworth & Helper Br.
PR—C. N. Strevell **Salt Lake City, Utah**
GM—C. N. Strevell, "
TR—Jas. H. Paterson, " "
PA—W. B. Outcalt, " "
CHIEF ENG—G. A. Murphy, Salt Lake City, Utah
GS—G. A. Murphy, " "
MS—W. J. Elwood..**Kenilworth, Utah**
SM—B. Randolph, " "
MM—W. H. Woodhead, " "
EE—W. H. Woodhead " "
SCO—Kenilworth Mercantile Co., **buyer,** A. H. Draper, Kenilworth, Utah.
S of H—Horses, rope **and gravity; track** gauge 42 in.
S of M—Hand **and 6 Elec. mining mach.**
PP—8 Kewanee return tubular **boilers,** total 1000 H. P., 2 gen. **units,** 2300 volts, A. C., **3 phase, 60** cycles; 250 volts D. C.
EMP—250. Last fiscal year output 236,000 tons.
Sales agent, Wm. Groton, Salt Lake City, Utah.

KETCHAM COAL CO.
PO—Castle Gate, Utah **CTY—Carbon.**
MS—G. C. Miller...**Castle Gate, Utah**
State report.

KIDD BROS.
Bluebell Mine, **Slope, Seam 7 ft. thick.**
PO—Vernal, Utah. **CTY—Uinta.**
GM—A. C. Kidd.........Vernal, Utah
MS—T. E. Kidd, " "
S of H—Mules; track gauge 24 in.
S of M—Hand.
EMP—2. Last fiscal year output 200 tons.

KNIGHT INVESTMENT CO.
General Office, Provo, Utah.
Johnson No. 2 Mine; Drift; **Bituminous** Seam, 84 to 120 in. thick.
PO—Orangeville, Utah; CTY—Emery.
PR—Jesse Knight..........Provo, Utah
MS—A. M. Johnson....Orangeville, Utah
Idle for about 20 months.

MOUNT PLEASANT COAL CO.
Out of business.

THE NEW HARMONY ANTHRACITE COAL CO.
PO—Cedar City, Utah; CTY—Iron.
Shaft; Drift and Stripping Mines; Colorado Group Cretaceous Seam; 66 in. thick.
PO—New Harmony, Utah; CTY—Washington.
GM—R. A. Kirker, New Harmony, Utah
MS..R. A. Kirker, " "
S of H—Mules.
S of M—Hand.
EMP—3.
Note—At present engaged in development work.

PACK & ALLAN.
Mill Mine; Slope; Seam 40 to 66 in. thick.
PO—Vernal, Utah; SP—Via Watson, Utah; CTY—Utah.
TR—L. H. Allan........Vernal, Utah
GM—Leon R. Pack, " "
MS—Leon R. Pack, " "
PA—L. H. Allan, " "
S of H—Rope; track gauge 24 in.
S of M—Hand and 1 Elec. mach.
PP—One pump; buy power.
EMP—2 to 4. Last fiscal year output 4,500 tons.

RICH, JOSEPH,
PO—Vernal, Utah. **CTY—Uinta.**
MS—Joseph E. Rich.....Vernal, **Utah**
State report.

SAN RAFAEL FUEL CO.
General Office, 341 S. Main St. Salt Lake City, Utah.
Queatchuppah No. 1 Mine; Drift, Mancos Seam, 20 to 22 ft. 2 in. thick.
PO—Emery, Utah; CTY—Emery.
PR—P. J. Quealy, ...Kemmerer, Wyo.
TR—A. W. McKinnin,....Price, Utah.
GM—Ira R. Browning.....Emery, Utah.
S of H—Gravity.
S of M—Hand.
EMP—3; Last fiscal year output 1000 tons.

SPRING CANYON COAL CO.
General Office, 817 Newhouse Bldg., Salt Lake City, Utah.
Spring Canyon Mine, Drift; Sub-Seams Nos. 1 and 2, Castle Gate Seam No. 3; 4 ft. 6 in. to 12 ft. thick.
PO—Storrs, Utah; SP—Same; CTY—Carbon; RR—Denver & Rio Grande, Spring Canyon Br.
PR—Jesse Knight..........Provo, Utah
GM—J. W. Knight, " "
ASST GM—Geo. A. Storrs, " "
TR—J. S. Smith, Salt Lake City, Utah
PA—J. A. Stallings, " "
MS—A. E. Gibson........Storrs, Utah
EM—W. W. Clyde, " "
MM—Wm. Stephenson, " "
EE—Wm.Stephenson, " "
SCO—Storrs Merc. Co. Buyer, D. George Shorton, Storrs, Utah.
S of H—9 Elec. loco.; track gauge 40 in.
S of M—12 Elec. **machines.**
PP—5 return tubular boilers, total 750 H. P., 2300 volts, A. C., 3 phases, 60 cycles, 250 **volts,** D. C.; 2 small pumps.
EMP—260. Last fiscal year output, 195,000 tons.
Sales Agent, J. S. Smith, **Salt Lake City, Utah.**

STANDARD COAL COMPANY
General Office, Salt Lake City, Utah.
Standard Mine; Drift; Mesaverde Seam; 72 to 168 in. thick.
PO—Standardville, Utah; SP—Same; CTY—Carbon; RR—D. & R. G., Spring Canon br.
PR—F. A. Sweet, Salt Lake City, Utah
TR—C N. Sweet, " "
GM—H. E. Lewis, " "
PA—H. E. Lewis, " "
SUPT—G. A. Knox..Standardville, Utah
MS—G. A. Knox, " "
MM—Chas. Peterson, " "
EE—Andrew Anderson, " "
SM—O. W. Beemis, " "
SCO—Standard Stores Co., " "
S of H—Gravity and 1 elec. loco. Track gauge 42 in.
S of M—Hand and one elec. mach.
PP—2 water tube boilers, total 400 H. P., 1 gen. unit, 2300 volts A. C., 60 cycles, 2 pumps.
EMP—200. Last fiscal year output, 148,000 tons.

STRAIGHT CANYON MINING CO.
Oliphant Mine; 68 to 72 in. thick.
Owned and operated by Oliphant Bros.
MS—Ralph Oliphant..Orangeville, Utah
EMP—3. Output 175 tons.

SUMMIT FUEL CO.
Slope Mine; Wasatch Seam; 72 to 108 in. thick.
PO—Coalville, Utah; SP—Coalville; CTY—Summit; RR—Union Pacific, Park City branch.
PR—F. N. Steinhaur...Kemmerer, Wyo.
MM—F. N. Steinhaur, " "
TR—Glenn Logan, Salt Lake City, Utah
GM—Gomer Reese.......Frontier, Wyo.
GS—Gomer Reese, " "
PA—Gomer Reese, " "
S of H—Mules, rope and steam locos. Track gauge 36 in.
S of M—Hand.
PP—2 return tubular boilers, total 225 H. P., 1 steam pump.
EMP—26. Last fiscal year output, 4,500 tons.

UNION FUEL CO.
General Office, Ogden, Utah.
Grass Creek Mine, Slope, **Grass Creek** Seam 7 to 14 ft. thick.
PO—Coalville, Utah; SP—Grass Creek; CTY—Summit; RR—Union Pacific.
PR—M. S. Browning.....Ogden, Utah
TR—Royal Eccles, " "
GM—D. H. Pape, " "
MS—J. H. Roberts, ..Grass Creek, Utah
PA—H. C. King..........Ogden, Utah
GS—R. Y. Gibson...Rock Springs, Wyo.
EM—R. Y. Gibson, " "
S of H—Mules; track gauge 3 ft.
S of M—Hand.
PP—4 Water tube boilers, total 400 H. P., 3 engines, 3 pumps.
EMP—80. Last fiscal year output, 33,217 tons.
Sales Agent, H. C. Marchant, Ogden, Utah.

UNITED STATES FUEL COMPANY
General Office, Kearns Bldg., Salt Lake City, Utah.
PR—C. W. Van Law, Salt Lake City, Utah
TR—G. E. Forrester " " " "
GM—A. B. Apperson " " " "
CE—C. F. Moore, " " " "
GS—R. M. Magraw.....Hiawatha, Utah
PA—T. W. Lewis, " "
EM—F. C. Brundage, " "
MM—R. R. Garr, " "
SM—Geo. D. Raymond, " "
SCO—Carbon-Emery Stores Co.

Blackhawk Mine; Drift; Brook Cliff Seam; 12 to 19 ft. thick.
PO—Hiawatha, Utah; SP — Same; CTY—Carbon; RR—D. & R. G., Southern Utah branch.
MS—C. N. Orr........Hiawatha, Utah
S of H—Mules and 5 elec. mach. Track gauge 42 in.
S of M—16 elec. mach.
PP—4 return tubular boilers, total 600 H. P., gen. unit, 2300 volts A. C., 3 phase, 60 cycles, 9 pumps.
EMP—300. Last fiscal year output 186,000 tons.

Mohrland Mine; Drift; Book Cliff Seam; 12 to 19 ft. thick.
PO—Mohrland, Utah; SP—Same; CTY—Emery; RR—Castle Valley.
MS—M. L. Garvey...Black Hawk, Utah
S of H—Mules and 7 elec. locos. Track gauge 42 in.
S of M—Hand and 17 elec. mach.
PP—3 return tubular boilers, total 1450 H. P., gen. unit, 2300 A. C., 3 phase, 60 cycles, 1 comp., 9 pumps.
EMP—325. Last fiscal year output 258,000 tons.

Hiawatha Mine; Drift; Book Cliff Seam; 12 to 19 ft. thick.
PO—Hiawatha, Utah; SP—East Hiawatha, Utah; CTY—Carbon; RR—D. & R. G., Southern Utah branch.
MS—Gus Goodhart......Hiawatha, Utah
S of H—7 elec. locos. and rope. Track gauge 42 in.
S of M—Hand and 16 elec. mach.
PP—8 return tubular boilers, 1—750 K. W. turbine, two 250 K. W. gen. 2300 volts A. C., 3 phase, 60 cycles, 1 comp., 9 pumps.
EMP—400. Last fiscal year output 220,000 tons.

Panther Mine; Slope; Castle Gate Seam; 6 to 8 ft. thick.
PO—Carbon, Utah; SP—Panther-Switch or Castle Gate; CTY—Carbon; RR—D. & R. G.
S of H—Mules, rope and elec. Track gauge 40 in.
S of M—4 elec. mach.
PP—1 Gen. unit, 2300 volts A. C., 3 phases, 60 cycles. Purchase power.
EMP—85. Last fiscal year output 44,000 tons.
Successors to Black Hawk Coal Co., Castle Valley Coal Co., Consolidated Fuel Co. and Panther Coal Co.

UTAH FUEL CO.

General Office, Salt Lake City, Utah.
5 Mines in Utah and 1 Mine in Colo.
PR—E. T. Jeffery....New York, N. Y.
TR—Asst. E. A. Greenwood, Salt Lake City, Utah
GM—A. H. Cowie, " "
VP—A. H. Cowie, " "
PA—H. N. How, " "
EM—A. C. Watts, " "
GS—Jas. S. Thompson, " "
MM-Genl—A. A. Le Roy, " "
SCO—Wasatch Store Co., buyer J. B. Shinness, Salt Lake City, Utah.
Sales Agency, A. D. Pierson, Salt Lake City, Utah.

Castle Gate Mine, Drift, Seam 12½ ft. thick.
PO—Castle Gate, Utah; SP—Same; CTY—Carbon; RR—D. & R. G.
MS—Wm. Littlejohn..Castle Gate, Utah
SM—Levi Davis, " "
S of H—2 Elec. loco. and mules; track gauge 40 in.
S of M—11 Elec. mach. and hand.
PP—11 Return tubular boilers, total 1375 H. P., 3 gen. units 500 volts D. C.
EMP—445. Last fiscal year output 333,967 tons.

Winter Quarters Mine; Drift; Seam, 14 ft. thick.
PO—Winter Quarters, Utah; SP—Scofield, Utah; CTY—Carbon; RR—D. & R. G.
MS—T. J. Parmley, Winter Quarters, Utah
SM—D. A. Haymond, " "
S of H—2 Elec. loco. and mules; track gauge 36 in.
S of M—Hand.
PP—9 Return tubular boilers, total 1125 H. P., 4 gen. units 500 volts D. C., 1 pump.
EMP—246. Last fiscal year output 223,370 tons.

Clear Creek Mine; Drift; Seam, 14 ft. thick.
PO—Clear Creek, Utah; SP—Scofield, Utah; CTY—Carbon; RR—D. & R. G.
MS—F. C. Hennes....Clear Creek, Utah
SM—Samuel Woodhead, " "
S of H—2 Elec. loco. and mules; track gauge 40 in.
S of M—Hand and 2 Elec. mach.
PP—6 return tubular boilers, total 750 H. P., 2 gen. units, 500 volts D. C., 3 pumps.
EMP—238. Last fiscal year output 216,910 tons.

Utah Mine; Drift; Seam, 8 ft. thick.
PO—Utah Mine, Utah, SP—Scofield, Utah; CTY—Carbon; RR—D. & R. G.
MS—Andrew Gilbert...Utah Mines, Utah
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—2 return tubular boilers, total 250 H. P., 1 pump.
EMP—38. Last fiscal year output 28,841 tons.

Sunnyside Mine; Drift and Slope; Seam, 60 to 132 in. thick.
PO—Sunnyside, Utah, SP—Same; CTY—Carbon; RR—D. & R. G.
MS—W. N. Wetzel....Sunnyside, Utah
SM—A. D. Hadley, " "
S of H—4 Elec. loco. and mules.
S of M—4 elec. mach. and hand.
PP—14 Return tubular boiler, total 1725 H. P., 3 gen. units 500 volts D. C., 2 pumps.
EMP—1105. Coke ovens, 726, Bee Hive. Last fiscal year output 683,221 tons.

WEBER COAL CO.

General Office, Salt Lake City, Utah, P. O. Box 1328.

Wasatch Mine, Slope, Weber River Seam, 9 to 14½ ft. thick. ville, Utah; CTY— Summit; RR—Union Pacific, Echo and Park City Br.

PR—J. E. Bamberger, Salt Lake City, Utah
GM—Ernest Bamberger, " "
PA—Wm. Pitt, " "
MS—T. J. Lewis......Coalville, Utah
MM—Jos. Jones, " "
EM—F. T. Williams..Park City, Utah
S of H—Mules; track gauge 30 in.
S of M—Hand.
PP—3 Return tubular boilers, total 160 H. P., 5 pumps.
EMP—34. Development work, 16,878 tons.
Sales Agent, Herbert Cohen, Salt Lake City, Utah.
(Old information.)

WEST MOUNTAIN COAL CO.

Wales Mine.
PO—Wales, Utah; CTY—Sampete.
MS—W. J. Rees.........Wales, Utah
State report.

VIRGINIA

For List of Abbreviations See Page 622.

BIG VEIN POCAHONTAS COAL CO.

General Offices, Columbus, O. and Baltimore, Md.
PR—H. H. Heiner........Columbus, O.
GM—H. H. Heiner, " "
TR—J. J. Sheehan......Baltimore, Md.
GS—Geo. B. Smith.....Pocahontas, Va.
PA—Geo. B. Smith, " "
MS—Geo. B. Smith, " "
MM—Frank Woods, " "
EE—R. E. Cassell, " "
EM—D. C. Jones.....Bramwell, W. Va.
SCO—Big Vein Pocahontas Co. Buyer, A. E. Greene, Pocahontas, Va.

No. 1 Mine; Shaft; Pocahontas No. 3 Seam, 120 to 144 in. thick.
PO—Pocahontas, Va;. SP—Same; CTY—Tazewell; RR—N. & W., Pocahontas Division.
MS—Geo. B. Smith....Pocahontas, Va.
S of H—Mules and 1 elec. loco. Track gauge 36 in.
S of M—Hand.
PP—Power from Central Station at No. 2 Mine.
EMP—100. Last fiscal year output 30,000 tons.

No. 2 Mine; Slope; Pocahontas No. 3 Seam; 120 to 144 in. thick.
PO—Pocahontas, Va.; SP—Ollivette; CTY—Tazewell; RR—N. & W., Pocahnotas Div.
S of H—5 elec. locos. Track gauge 44 in.
S of M—1 elec. mach.
PP—4 Babcock & Wilcox return tubular boilers, 2 gen. units, 550 volts D. C., 3 pumps.
EMP—275. Last fiscal year output 250,000 tons.

BIG TOWN HILL CREEK COAL CORP.

Big Town Hill Creek Mine, Slope, Red Ash Seam, 66 to 96 in. thick.
PO—Richlands, Va.; SP—Same; CTY—Tazewell; RR—N. & W.
PR—A. M. Stinson.....Richlands, Va.
TR—H. A. Lee, " "
GM—J. M. Wilson, " "
GS—J. M. Wilson, " "
PA—J. M. Wilson, " "
SCO—A. M. Stinson Store. Buyer, A. M. Stinson.
S of H—Mules.
S of M—Hand.
EMP—37. Last fiscal year output 16,040 tons.

BLACK MTN. MNG. CO. INC.

General Office, Big Stone Gap, Va.
Kamart Mine: Drift; No. 5 Seam.
PO—St. Charles, Va.; SP—Same; CTY—Lee; RR—V. & S. W. L. & N.
GM—J. W. Kelley, Big Stone Gap, Va.
PA—J. W. Kelley,
EM—Fox & Peck, " "
MS—J. P. Adams, " "
S of H—Mules and elec. locos.
S of M—Elec. mach.
PP—2 boilers, total 150 H. P., Rotary converter, gen. units, 250 volts D. C.
EMP—200.

BLACKSBURG COAL CO.

Blacksburg Mine; Slope; Seam 41 in. thick.
PO—Blacksburg, Va.; SP—Same; CTY—Montgomery; RR—N. & W. and Virginian.
PR—N. M. Orr........Blacksburg, Va.
TR—Seymour Price, " "
GS—Seymour Price, " "
PA—Seymour Price, " "
MS—Seymour Price, " "
GM—N. M. Orr, " "
S of H—Mules.
S of M—Hand.
EMP—6.
Note—At present engaged in development work.

BLACKWOOD COAL & COKE CO.

General Office, Blackwood, Wise Co., Va.
2 Mines in Virginia and 1 in Kentucky.
PR—C. Pardee..........Phila., Pa.
TR—A. Pardee, " "
GM—C. J. Creveling..Blackwood, Va.
PA—C. J. Creveling, " "
EM—E. L Gubbie, " "
MM—Wm. Yock........Blackwood, Va.
EE—H. L. Flanary........Pardee, Va.
Sales Agent, C. F. Rice, Jr., Spartanburg, S. C.

Roaring Fork Mine, Drift, Seam 48 in. thick.
PO—Roaring Fork, Va.; SP—Same; CTY—Wise; RR—Southern, Roaring Fork Br. Interstate.
MS—M. D. Niedifer, Roaring Fork, Va.
SM—V. B. Keys, " "
Gen. Foreman—Geo. S. Fuller, Roaring Fork, Va.
S of H—6 elec. loco. Track gauge 44 in.
S of M—6 Elec. machines.
PP—4 Return tubular boilers, total 500 H. P., 4 gen. units, 610 volts D. C., and 2 pumps.
EMP—200. Coke ovens 282 Bee Hive at Blackwood, Va.

Pardee Mine, Drift, Seam 10 ft. 4 in. thick.
PO—Pardee, Va., SP—Same, CTY—Wise; RR—Roaring Fork Br., Southern.
MS—J. F. Bohannon.....Pardee, Va.
SM—J. F. Affantranger,..Pardee, Va.
S of H—7 Elec. loco., track gauge 44 in.
S of M—7 Elec. mach.
PP—1 Edgemoor water tube and 2 H. S. & G. return tubular boilers, total 800 H. P., 3 gen. units 500 volts D. C., 2 pumps.
EMP—500. Last fiscal year output, (for both mines) 375,000 tons.

BLUE RIDGE COAL CO.

General Office, Roanoke, Va.
Blue Ridge Mine; Drift; Upper and lower Banner Seam; 36 to 60 in. thick.
PO—Norton, Va.; SP—Pine, Va.; CTY—Wise; RR—N. & W., Clinch Valley Div.
PR—F. G. Hatton....... Columbus, O.
TR—Wm. M. Brown......Roanoke, Va.
MS—H. O. Bolling.......Coleburn, Va.
SM—Creed Jones........Coeburn, Va.
S of H—Mules; track gauge 36 in.
S of M—Hand.
PP—2 Pumps.
EMP—45. Last fiscal year output 35,000 tons.
Sales Agency, Hatton, Brown & Co., Roanoke, Va.

CLINCHFIELD COAL CORPORATION.

PR—C. E. Bockus..........Dante, Va.
TR—E. D. Jobe, " "
GS—Lee Long, " "
PA—J. L. Ubil, " "
EM—G. T. Stevens, " "
MM—C. E. Booker, " "
EE—C. J. Miller......Clinchfield, Va.
Sales Agent, Clinchfield Fuel Co., Spartanburg, S. C.

(Dante Operations)
Mines Nos. 2, 3, 4, 5, 52 and 103, Drifts; "Upper and Lower Banner" Seam, 4 to 6 ft. thick.
PO—Dante, Va.; SP—Same; CTY—Russell; RR—C. C. & O.
MS—R. G. John...........Dante, Va.
SM—M. C. Matthews, " "
S of H—64 Elec. loco.
S of M—39 Elec. mach.
PP—4 compressors and 8 pumps. Power from central station at Hurricane Mine.
EMP—1000. Last fiscal year output 1,200,000 tons.

(Laurel operation)
Mines Nos. 6 and 55; Drifts "Upper" and Lower Banner" Seam, 4 to 6 ft. thick.
PO—Wilder, Va.; SP—Hurricane, Va.; CTY—Russell; RR—C. C. & O.
MS—W. J. Heatherman,..Wilder, Va.
SM—M. C. Matthews......Dante, Va.
S of H—25 Elec. loco.; track gauge 48 and 36 in.
S of M—15 Elec. mach.
PP—1 compressor and 7 pumps. Power from Hurricane Mine.
EMP—650. Last fiscal year output, 780,000 tons.

Cranes Nest Mine No. 1, Drift; "Upper Banner" Seam, 4 to 4 ft. 6 in. thick.
PO—Toms Creek, Va.; SP—Same; CTY—Wise; RR—N. & W., Clinch Valley Br.
MS—D. L. Rumgay....Toms Creek, Va.
SM—M. C. Matthews......Dant Va.
S of H—12 Elec. loco.; track gauge 44 in.
S of M—12 Elec. mach.
PP—4 pumps. Power purchased.
EMP—350. Last fiscal year output 310,000 tons.

Hurricane Slope No. 201; Slope; "Imboden" Seam, 4 to 5 ft. thick.
PO—Clinchfield, Va.; SP—Hurricane, Va. CTY—Russell; RR—C. C. & O.
MS—W. J. Heatherman...Wilder, Va.
SM—M. C. Matthews......Dante, Pa.
S of H—3 Elec. loco.; track gauge 48 ins.
S of M—2 Elec. mach.
PP—10 Water tube boilers, toal 3000 A. C., 3 phase, 60 cycles, 2 pumps.
EMP—200. Last fiscal year output 75,000 tons.

COLONIAL COAL & COKE CO.

See Wise Coal & Coke Co.

DARBY COAL MINING CO.

Darby Mine; Drift, No. 5 Seam, 35 to 42 in. thick. Operate washery.
PO—Darbyville, Va. SP—St. Charles, Va. CTY—Lee. RR—L. & N., C. V. Div., Southern, V. & S. W. Div.
PR—J. R. McDowell ..Knoxville, Tenn.
TR—H. R. Houten, " "
GM—C. H. Thompson...Darbyville, Va.
GS—C. H. Thompson, " "
PA—R. B. McLane, " "
MS—E. A. Allen, " "
SM—J. W. Sells, " "
EM—Robert Howsley, " "
MM—H. C. Buchanan, " "
EE—H. C. Buchanan, " "
S of H—3 elec. loco. Track gauge 42 in.
S of M—10 comp. air mach.
PP—2 Erie return tubular boilers, total 350 H. P., 1 gen. unit, 250 volts D. C., 1 compressor and 2 pumps.
EMP—135. Last fiscal year output 83,000 tons.
Sales agent, R. H. Bartlet, Cincinnati, Ohio.

DOMESTIC COAL CO.

General Office, Bluefield, W. Va.
Domestic Mine, Drift.
PO—Ravens, Va. SP—Same. CTY—Tazewell. RR—N. & W.
GM—E. Bond ......Bluefield, W. Va.
PA—E. Bond, " "
EM—Scarborough & Dodson. Norton, va.
MS—J. C. Preas ....Raven, Va.
SM—E. Bond, " "
S of H—Elec. loco. and mules.
S of M—Hand.
PP—Gen. units, 250 volts A. C., boiler, 150 H. P.
EMP—60.
(Old information.)

EMPIRE COAL LAND CORP.

M. Ziegler, Receiver.
PR—A. K. Morison.....Alfredton, Va.
TR—A. C. Matherson, " "
GS—M. Ziegler, " "
PA—M. Ziegler.........Alfredton, Va.
EM—Fox & Peck..Big Stone Gap, Va.
EE—E. C. Cassity, " "
MM—E. C. Cassity, Big Stone Gap, Va.
SCO—Address the Co. Buyer, C. G. Jieter, Alfredton, Va.
Sales agent, Wm. C. Atwater & Co.

Seaboard Mine; Drift; Seam 36 to 60 ins. thick.
PO—Alfredton, Va. SP—Seaboard. CTY—Tazewell. RR—Big Creek Br., N. & W.
MS—C. S. Kennedy....Alfredton, Va.
SM—S. F. Lovell, " "
S of H—6 elec. locos. Track gauge 4 ft.
S of M—Hand and 5 elec. mach.
PP—4 water tube boilers, total 600 H. P., 2 gen. units, 250 volts D. C., 2 pumps.
Coke ovens, 100 Bee Hive.
EMP—300. Output for six months 42,850 tons. Coke ovens, 100 Bee Hive.

Richlands Mine, Drift, Seam 4 to 6 ft. thick.
PO—Seaboard, Va. SP—Lark, Va. CTY—Tazewell. RR—N. & W., Big Creek Branch.
MS—M. Zeigler ....Seaboard, Va.
SM—W. C. Amos, " "
S of H—Mules and 1 elec. loco. Track gauge 42 in.
S of M—Hand.
PP—2 return tubular boilers, total 250 H. P., 1 gen. unit, 250 volts D. C., 1 pump.

ESSER COAL & COKE CO.

See J. A. Esser Coke Co., Inc.

ESSER, J. A. COKE CO.

General Office, Esserville, Va.
Kyle Nos. 1 and 3 Mines; Lower Banner Seam, 38 to 42 in. thick.
PO Esserville, Va.; SP—Same; CTY—Wise; RR—Interstate.
PR—John A. Esser.........Norton, Va.
TR—John A. Esser, " "
GM—John A. Esser, " "
PA—John A. Esser, " "
GS—G. H. Esser, " "
MS—Robt. Harmon......Esserville, Va.
EM—F. T. Dodson........Norton, Va.
SCO—J. A. Esser Coke Co. Buyer, W. M. Webb, Esserville, Va.
S of H—Mules and 2 steam locos. Track gauge 44 and 56 in.
PP—1 return tubular boiler, total 150 H. P., 1 pump.
EMP—120. Output 40,221 tons. 102 Bee Hive coke ovens.
Note—Formerly the Esser Coal & Coke Co.

EUREKA COAL CO.

Stroubles Creek Mine; Slope; Price Mountain Seam, 54 to 60 in. thick.
PO—Vicar Switch, Va.; SP—Vicker, Va.; CTY—Montgomery; RR—N. & W.
PR—F. D. Kinzer, Vicar Switch, Va.
PA—F. D. Kinzer, " " "
GM—F. D. Kinzer, " " "
SM—F. D. Kinzer, " " "
TR—J. W. Kinzer, " " "
MS—R. J. Hodges, " " "
S of H—Steam loco. Track gauge 22 in.
S of M—Hand.
PP—1 water tube boiler, 60 H. P., 2 pumps.
EMP—8. Last fiscal year output 4,000 tons.
Successors to G. M. Kinzer & Sons.

FELTON COAL CO. Inc.

R. P. Bruce, Wise, Va., receiver and operator.
Greno Mines; Slope; Imboden Seam, 48 to 144 in. thick.
PO—Tacoma, Va.; SP—Same; CTY—Wise; RR—N. & W., Clinch Valley Div.
PR—R. P. Bruce, ...Wise, Va.
GM—R. P. Bruce ....Wise, Va.
GS—R. P. Bruce, " "
PA—R. P. Bruce, " "
MM—James Hall.........Tacoma, Va.
EE—Will Whited, " "
CE—Scarborough & Dotson, Norton, Va.
SCO—Address the Company. Buyer, J. R. Bruce, Tacoma, Va.
S of H—Mules and rope.
S of M—Hond.
PP—2 water tube boilers, total 200 H. P., 1 compressor, 2 pumps.
EMP—20. Last fiscal year output 7,500 tons.
H. P., 1 compressor, 4 pumps.
EMP—100.

FLAT ROCK COAL COMPANY, INC.

General Office, Della, Va.
Flat Rock Mine; Drift; Kennedy Seam; 30 to 48 in. thick.
PO—Della, Va. SP—Putnam, Va.; CTY Russell; RR—N. & W., Clinch Valley division.
PR—F. T. Lee,........Lynchburg, Va.
GM—F. T. Lee, " "
TR—Richard Hancock, " "
GS—John P. Hogan, ...Della, Va.
PA—John P. Hogan, " "
SM—O. G. Callihan, " "
EM—Meem & Haskins, Bluefield, W. Va.
SCO—Flat Rock Coal Company, Della, Va.
S of H—1 elec loco. Track gauge 44 in.
S of M—2 elec. mach.
PP—2 return tubular boilers, total 300 H. P., 1 gen. unit, 250 volts D. C.

FLEMING, ROBT. & CO.

General Office, Norton, Va.
Upper Banner Mines; Drift; "Upper Banner Seam; 60 in. thick.
PO—Banner, Va.; SP—Bannervane, Va.; CTY—Wise; RR—N. & W., Clinch Valley Br.
PR—Robert Fleming ......Norton, Va.
TR—Jas. B. Fleming, " "
GM—David Barrowman.....Banner, Va.
PA—R. H. Cure.........Banner, Va.
SM—R. H. Cure, " "
GS—Chas. Barrowman, " "
CE—F. Dotson...........Norton, Va.
S of H—1 steam loco. and 1 elec. loco. Track gauge 36 in.
S of M—Hand and 1 Elec. mach.
PP—1 water tube boiler, total 80 H. P., 1 steam pump.
EMP—75. Last fiscal year output 100,000 tons.

HUETTEL COAL & COKE CO.

Huettle Mine, Drift, "Edwards" Seam, 48 to 66 in. thick.
PO—Norton, Va. SP—Same. CTY—Wise. RR—N. & W.
PR—E. H. Ould,......Norton, Va.
GM—E. H. Ould, " "
TR—Mrs. Ethel C. Ould, " "
PA—E. H. Ould, " "
MS—H. G. Rose, " "
SM—W. S. Perry, " "
EM—Scarborough & Dotson, " "
S of H—Mules. Track gauge 44 in.
S of M—Hand and elec. mach.
PP—220 volts A. C., 3 phase, 60 cycles. Buy power.
EMP—75. Last fiscal year output 40,000 tons.

INTERMONT COAL & IRON CO.

General Office, Big Stone Gap, Va.
No. 1 Mine; Drift; Seam 60 in thick.
PO—Dooley, Va.; SP—Dorchester Junction, Va.; CTY—Wise; RR—L. & N. and Interstate Rly. Co.
PR—R. T. Irvine....Big Stone Gap, Va.
TR—J. W. Kelly, " " " "
GM—J. W. Kelly, " " " "
MS—M. K. Kelly, " " " "
MM—Wm. Kelly, " " " "
EM—Fox & Peck, " " " "
S of H—Mules.
S of M—Hand.
Coke Ovens, 80 Bee Hive.

JAMES RIVER COAL CORPORATION.

General Office. Richmond, Va.
Midlothian Mine, Shaft and Incline, Triassic Seam.
PO—Midlothian, Va. SP—Same. CTY—Chesterfield. RR—Sou.
PR—Meriwether Jones ..Richmond, Va.
TR—Meriwether Jones, " "
GM—Meriwether Jones, " "
MS—Meriwether Jones, "
PA—Thos. Armstrong, " "
S of H—Mules.
S of M—Comp. air.
PP—4 return tubular boilers, total 500 H. P., 2 air comp. and 4 pumps.

JEWELL RIDGE COAL CORPORATION.

General Office, Tazewell, Va.
Jewell Ridge, Pocahontas Mines; Drift; Jewell Pocahontas Seam;. 48 in. thick.
PO—Jewell Ridge, Va.; SP—Jewell, Va.; CTY—Tazellwell; RR—N. & W, Big Creek Br.
PR—Thos. M. Righter..Mt. Carmel, Pa.
TR—Geo. W. St. Clair....Tazewell, Va.
GM—Geo. W. St. Clair , " "
PA—W. H. Grady.......Tazewell, Va.
GS—W. H. Brady, " "
EM—J. P. Williams, " "
SM—J. J. Delp, " "
S of H—Mules 3 Elec., 1 gasoline and 1 steam loco.; track gauge 44 in.
S of M—Hand and 2 Elec. mach.
PP—Purchase power.
EMP—125. Last fiscal year output, 85,000 tons.
Sales Agent, Schraeder-Kelly Coal Co., Cleveland, O.

JONES MINING CO.

Kipps Mine.
PO—Wise, Va.; CTY—Wise.
No report.

KILGORE COAL COMPANY.

Lessee of Hogan Coal & Coke Co.
General Office, Colburn, Va;
Widow Kennedy Mine; Drift; Raven Red Ash Seam; 36 to 84 in. thick.
PO—Colburn, Va.; SP—Bruce Siding, (Prepay); CTY—Wise; RR—N. & W.
PR—Lee Kilgore,.......Colburn, Va.
TR Lee Kilgore, " "
GM—Lee Kilgore, " "
GS—Lee Kilgore, " "
PA—Lee Kilgore, " "
MS—T. M. Young, Tacoma Va.
CE—Scarborough & Dotson, Norton, Va.
EM—Scarborough & Dotson, " "
MM—E. E. Dooley, ... Colburn, Va.
EE—E. E. Dooley, " "
SCO—Kilgore Coal Co., buyer, W. J. Kilgore, Jr., Colburn, Va.
S of H—Mules, rope and gravity.
S of M—Hand.
PP—1 Boiler, total 25 H. P., 220 volts A. C., 3 phase, 60 cycles, 1 pump. Purchase power.
EMP—25. Last fiscal year output. 4500 tons

KIPPS ANTHRACITE COAL CO., INC.

Price Mtn. Mine.
PO—Cambria, R. F. D., Va.; CTY—Montgomery.
No report.

LEWIS CREEK COAL CO.

Drift Mine, Red Ash Seam, 36 to 46 in. thick.
PO—Richlands, Va.; SP—Putnam, Va.; CTY—Tazelwell; RR—N. & W.
PR—W. B. Spratt......Richlands, Va.
GM—T. N. Dougherty, " "
PA—W. B. Spratt, " "
TR—H. L. Spratt, " "
EM—T. P. Morgan, " "
CE—T. P. Morgan, " "
S of H—Mules.
S of M—Hand.
EMP—5. Last fiscal year output 1,000 tons.

LYKENS HILL COAL CO., Inc.

Nos. 1 and 2 Mines; Slopes; Price Mtn. Seam; 60 to 84 in. thick.
PO—Merrimac Mines, Va.; SP—Blacksburg, Va.; CTY—Montgomery; RR—N. & W., Blacksburg Br.
PR—L. S. Randolph, Blacksburg, Va.
TR—V. C. Austin, " "
GM—D. R. Jones........Cambria, Va.
GS—R. B. Shelor,..Merrimac Mines, Va.
PA—D. R. Jones...Merrimac Mines, Va.
EM—T. W. Walls,....Blacksburg, Va.
S of H—Steam loco., mules and rope, track gauge 22 and 36 in.
S of M—Hand.
PP—2 boilers, total 300 H. P., 1 pump.
EMP—85. Last fiscal year output 13,000 tons.
Sales Agency, West Virginia Coal Co., Richmond, Va.
Successors to the Becham Coal Co.

MATOAKA COAL CORPORATION.

General Office, Norfolk, Va.
Matoaka Mine; Drift; Red Ash Seam, 36 to 60 in. thick.
PO—Richlands, Va.; SP—Same; CTY—Tazewell; RR—N. & W., Town Hill Br.
PR—C. M. Kaylor........Norfolk, Va.
TR—J. Mark Chamberlain, " "
GM—C. M. Kaylor,......Norfolk, Va.
PA—E. Tatterson.......Richlands, Va.
MS—W. J. Elgin, " "
EM—W. J. Elgin, " "
SCO—Address the Company. Buyer, E. Tatterson, Richlands, Va.
S of H—Mules. Track gauge 42 in.
S of M—Hand.
EMP—35. Output for 9 months, 20,000 tons.
Successors to the Pocahontas Coal Mng. Co.

NORTON COAL CO.

Norton Mines, Drift, Upper and Lower Banner Seams, 48 to 72 in. thick.
PO—Norton, Va.; SP— Same; CTY—Wise; RR—L. & N., Sou., N. & W.,
PR—Warren J. Willits, Santa Barbara, California.
GM—Webb J. Willits ....Norton, Va.
PA—Webb J. Willits, " "
TR—Richard I. Cawthorne, " "
GS—Richard I. Cawthorne, " "
MS—C. P. McDonald, " "
EM—Scarborough & Dotson " "
CE—Scarborough & Dotson, " "
MM—Anderson Marion, " "
EE—Anderson Marion, " "
SM—Joe M. Porter, " "
S of H—Mules, 6 elec. and 1 steam loco. Track gauge 36 in.
S of M—Hand and 3 elec. mach.
PP—4 water tube boilers, total 500 H. P., 4 gen. units, 250 volts D. C., 3 phase, 60 cycles.
EMP—300. Last fiscal year output 136,000 tons.
Coke ovens, 150 Bee Hive.
Sales agent, Hatton Brown & Co., Roanoke, Va.

OLD VIRGINIA COAL CO.

General Office, Knoxville, Tenn.
Leona No. 1 Mine, Drift, No. 5 or Darby Seam, 36 to 50 in. thick.
PO—Leona Mines, Va. SP—St. Charles, Va. CTY—Lee. RR—L. & N., C. V. Div., Southern Va. and S. W. Div.
PR—J. R. McDowell..Knoxville, Tenn.
TR—J. R. McDowell....Cincinnati, O.
GM—C. H. Thompson..Leona Mines, Va.
PA—C. H. Thompson, " "
MS—C. H. Thompson, " "
GS—C. H. Thompson, " "
EM—Robert Housley, " "
MM—J. E. Jones, " "
EE—J. E. Jones, " "
SCO—Address the Company. Buyer, C. M. Bowles, Leona Mines, Va.
S of H—Mules and 2 elec. locos. Track gauge 44 in.
S of M—4 Elec. mach.
PP—2 return tubular boilers, total 300 H. P., 1 gen. unit, 250 volts D. C., 3 pumps.
EMP—165. Last fiscal year output 89,000 tons.
Sales agent, Darby Coal Sales Co., Cincinnati, Ohio.

POCAHONTAS CONSOLIDATED COLLIERIES CO., INC.

General Office, Pocahontas, Va.
Twenty-four mines in Virginia and West Virginia.
PR—Isaac T. Mann..Bramwell, W.Va.
TR—L. B. Crawford...Pocahontas, Va.
GM—Jas. Ellwood Jones, Switchback, W. Va.
Asst GM—J. C. Turley.Pocahontas, Va.
PA—W. D. Garwood, " "
CE—A. H. Stow, " "
EM—A. H. Stow, " "
EE—W. A. Bishop, " "
SCO—J. W. Bailey, buyer, " "
Gen. Counsel—Geo. W. Woodruff, 1 Broadway, N. Y.
Asst Sec—J. W. Graybeal, Pocahontas, Va.
Sales agency, Pocahontas Fuel Co., 1 Broadway, New York.
West Mine and Baby Mine, Drifts, Pocahontas No. 3 Seam; 144 in. thick.
PO—Pocahontas, Va. SP—Same. CTY—Tazewell. RR—N. & W.
MS—R. Wallace......Pocahontas, Va.
SM—W. R. Sheets, " "
S of H—Mules, rope, elec. and steam loco.; track gauge 36 in.
S of M—Elec. mach.
PP—Power purchased.
Coke ovens, 800, Bee Hive.

Boissevain Mine, Shaft, Pocahontas No. 3 Seam, 144 in. thick.
PO—Boissevain, Va. SP—Same. CTY—Tazewell. RR—N. & W., Pocahontas Div.

MS—J. K. Whitehead..Boissevain, Va.
SM—T. R. Aiken, " "
S of H—Rope and elec. Track gauge 36 in.
S of M—Electric mach.
PP—Power purchased.

PULASKI ANTHRACITE COAL CO.

General Office, No. 1 Broadway, New York.
Slope, "Brush Mountain" Seam, 6 to 8 ft. thick. Operate washery.
PO—Parrott, Va. SP—Same. CTY—Pulaski; RR—Radford Div., N. & W.
PR—W. Del Walbridge.
TR—J. H. Parrott ......Parrott, Va.
GM—J. H. Parrott, " "
MS—Arthur E. Morgan, " "
PA—Arthur E. Morgan, " "
SM—T. C. Harris, " "
S of H—Rope and mules. Track gauge 38 in.
S of M—Hand.
PP—Boilers, total 450 H. P.
EMP—130.
Sales agent, Smokeless Fuel Co.

RAVEN COLLIERIES CO., INC.

General Office, Bluefield, W. Va.
Raven Nos. 1, 2 and 3 Mines; Drifts; Raven Red Ash Seam; 32 to 48 in. thick.
PO—Red Ash, Va.; SP—Same; CTY—Tazewell; RR—N. & W., Clinch Valley Div., Coal Creek Br.
PR—Herbert Markle,...Bluefield, W. Va.
VPR—J. Elliott Hall, " "
TR—W. S. Patterson, " "
Secy —J. S. Kahle, " "
CE—T. M. Morrison, " "
GM—T. M. Morrison, " "
PA—T. M. Morrison, " "
MS—E. S. McCorkle, Red Ash, Va.
SM—W. G. Newland, " " "
S of H—Mules; track gauge 44 in.
S of M—Hand.
PP—Boiler 35 H.P.
EMP—40. Last fiscal year output 15,000 tons.
Sales agent, Bluefield Coal & Coke Co., Bluefield, W. Va.
Successors to the Raven Fuel Co., Inc.

RAVEN RED ASH COAL CO.

Raven Red Ash Mine; Drift; Lower Banner Seam, 30 to 60 in. thick.
PO—Red Ash, Va.; SP—Same (Prepay); CTY—Tazewell; RR—N. & W., Clinch Valley Br.
PR—J. N. Harman .....Tazewell, Va.
TR—C. B. Neel,........Red Ash, Va.
GM—C. B. Neel, " "
GS—C. B. Neel, " "
PA—C. B. Neel, " "
MS—W. T. Beevers, " "
SM—H. B. Long, " "
EM—Meems & Haskins, " "
EM—Meem & Haskins, Bluefield, W. Va.
CE—Meem & Haskins, " "
S of H—Mules and 4 elec. locos. Track gauge 48 in.
S of M—Hand and 6 Elec. mach.
PP—2 Atlas return tubular boilers, total 300 H. P., 2 gen. units, 250 volts D. C.
EMP—150. Last fiscal year output 80,000 tons.
Sales Agent, C. B. Neel ,Red Ash, Va.

RED ASH POCAHONTAS COAL CO.

Red Ash Poca Mine, Drift, Red Ash Seam, 30 to 72 in. thick.
PO—Raven, Va.; SP—Same; CTY—Tazelwell; RR—N. & W., Coal Creek Br.
GM—W. H. Plant........Columbus, O.
PA—W. H. Plant, " "
GS—W. H. Plant, " "
EM—Scarboro & Dotson....Norton, Va.
SCO—Address the Company, Raven, Va.
S of H—2 Elec. loco.; track gauge 44 in.
S of M—Hand.
PP—Power purchased.
EMP—45. Last fiscal year output 26,600 tons.
Sales Agency, Colonial Coal & Supply Co., Columbus, O.

SANDY RIDGE COAL & COKE COMPANY

General Office, Bluefield, W. Va.
Drift Mine; 36 to 60 in. thick.
PO—Drill, Va.; SP—Same; CTY—Russell; RR—N. & W., Honaker Timber branch.
PR—E. E. Carter.....Bluefield, W. Va.
TR—E. E. Carter " "
GM—J. H. Carter..........Drill Va.
PA—J. H. Carter, " "
MS—J. H. Carter, " "
CE—W. B. Williams...Honaker, W. Va.
EM—W. B. Williams, " "
SM—O. V. Vandyke........Drill, Va.
Last fiscal year output 50,000 tons.

SLUSSER, M. C. & COMPANY

Brush Mountain Mine; Drift; Brush Mountain Seam; 48 to 168 in. thick.
PO Blacksburg, Va.; SP—Same; CTY—Montgomery; RR—N. & W., Blacksburg Branch.
PR—M. C. Slusser.....Blacksburg, Va.
TR—M. C. Slusser " "
GS—M. C. Slusser " "
PA—M. C. Slusser, " "
MS—C. W. Allen, " "
CE—A. Murrill, " "
SCO—M. C. Slusser & Co. Buyer, M. C. Slusser. Blacksburg, Va.
S of H—Mules. Track gauge 24 in.
S of M—Hand.
PP—1 water tube boiler, 40 H. P., 2 gen. units, 1 pump.
EMP—27. Last fiscal year output 3,500 tons.

STONEGA COKE & COAL CO.

General Office, Big Stone Gap, Va.
Philadelphia Office, Land Title Bldg., Philadelphia, Pa.
PR—D. B. Wentz....Land Title Bldg., Philadelphia, Pa.
TR—H. B. Price, Land Title Bldg., Philadelphia, Pa.
GM—E. Drennen..Big Stone Gap, Va.
VP—E. Drennen " "
PA—W. B. Edwards...Appalachian, Va.
EM—D. B. Sayers, " "
MM—W. C. Shunk, Big Stone Gap, Va.
GS—R. E. Taggart......Stonega, Va.
SM—S. J. Gundry, " "
Sales Mgr., E. Drennen, Big Stone Gap, Va.

Stonega Nos. 1, 2, 3 and 4 Mines, Drift, Imboden Seam.
PO—Stonega, Va. SP—Same. CTY—Wise. RR—Interstate.
MS—C. G. Duffy ....Stonega, Va.
S of H—Mules and elec. loco.
S of M—Hand and machine.
PP—250 volts D. C. Power from central plant.

Osaka Nos. 1 and 2 Mines, Drift, Imboden Seam.
PO—Osaka, .Va SP—Same. CTY—Wise. RR—Interstate.
MS—E. F. Tate..........Osake, Va.
S of H—Mules and elec. locos.
S of M—Hand and elec. mach.
PP—250 volts D. C. Purchase power.

Roda Nos. 1, 2, 3 and 4 Mines, Drift, Taggart Seam.
PO—Roda. Va. SP—Same. CTY—Wise.
MS—W. A. Owens ....Roda, Va.
S of H—Mules and elec. locos.
S of M—Hand and elec. mach.
PP—500 volts D. C. Purchase power.

Arno Nos. 1 and 2 Mines, Drift, Imboden Seam.
PO—Arno, Va. SP—Same. CTY—Wise.
MS—C. W. Rotenberry .....Arno, Va.
S of H—Mules and elec. locos.
S of M—Hand and elec. mach.
PP—250 volts D. C. Purchase power.
Imboden Mine; Drift; Imboden Seam.
PO—Imboden, Va., SP—Same; CTY—Wise. RR—V. & S. W.
MS—H. A. Alexander....Imboden, Va.
S of H—Mules and elec. locos.
S of M—Hand.
PP—250 volts D. C. Purchase power.

Keokee Nos. 2 and 3 Mines, Drift, McConnell Seam.
PO—Keokee, Va. SP—Same. CTY—Lee. RR—V. & S. W.
MS—J. K. Taggart .....Keokee, Va.
S of H—Elec. loco.
S of M—Hand.
PP—250 volts D. C. Purchase power.
Clover Fork Mine, Drift.
PO—Keokee, Va. SP—Same. CTY—Lee. RR—V. & S. W.
MS—J. K. Taggart.......Keokee, Va.
S of H—Mules and elec. loco.
S of M—Hand and elec. mach.
PP—250 volts D. C. Purchase power.
EMP—4000 at all mines.
Coke Ovens—1,756, Bee Hive, situated at Stonega, Oska, Imboden and Keokee.

STONE GAP COLLIERY CO.

Glamorgan Mines, Drift, Edwards Seam. 48 to 78 in. thick.
PO—Glamorgan, Va. SP—Same. CTY—Wise. RR—Interstate, Glamorgan Div.
PR—Jas. Gayley, 71 Broadway, New York, N. Y.
TR—J. R. Floyd, 71 Broadway, New York, N. Y.
VP—J. S. Cheyney....Glamorgan, Va.
GS—J. S. Cheyney, " "
PA—J. S. Cheyney, " "
MS—J. S. Cheyney....Glamorgan, Va.
MM—J. E. Williams, " "
EE—J. E. Williams, " "
SCO—Stone Gap Colliery Co. Store. Buyer, W. H. Mullins, Glamorgan, Va.
S of H—Mules and 9 elec. locos. Track gauge 44 in.
S of M—6 Elec. mach.
PP 4 Atlas return ubular boilers, 500 H. P., 3 gen. units, 250 volts D. C., 1 compressor, 2 pumps.
EMP—150. Last fiscal year output 84,000 tons.
Coke ovens, 350 Bee Hive.

STEPHENS COAL COMPANY

Drift Mine; Edwards Seam; 36 to 50 in. thick.
PO—Wise, Va.; SP—Same; CTY—Wise; RR—Va. & Ky.
PR—F. L. Stephens........Wise, Va.
TR—F. L. Stephens, " "
GM—F. L. Stephens, " "
GS—F. L. Stephens, " "
PA—F. L. Stephens, " "
MS—J. C. Stargill, " "
EE—Wm. Stargill, " "
SM—J. B. Richmond, " "
S of H—Mules. Track gauge 42 in.
S of M—1 elec. mach.
PP—Two pumps, 220 volts A. C., 3 phases, 60 cycles. Purchase power.
EMP—22. Last fiscal year output, 15,000 tons.

SUTHERLAND COAL & COKE CO.

See Wise Coal & Coke Co.

UNITED COLLIERIES, INC.

PR—R. Tate Irvin..Big Stone Gap, Va.
TR—N. D. Bachman......Brisol, Va.
GM—C. W. Bondurant.St. Charles, Va.
GS—W. M. Risden.....St. Charles, Va.
PA—C. W. Bondurant, " "
EM—L. M. Parsons, " "
CE—W. E. Pucketts....Pennington, Va.
Sales agent, Bewley Darst Coal Co., Bristol, Va.

Dominion Mine, Drift, No. 5 Seam, 40 to 50 in. thick. Operate washery.
PO—St. Charles, Va. SP—Same. CTY—Lee. RR—L. & N., and V. & S. W.
MS—W. M. Risden,...St. Charles, Va.
SM—C. P. Russell, " "
S of H—3 elec. loco. Track gauge 44 in.
S of M—3 elec. mach.
PP—2 pumps purchase power.

Bondurant Mine Drift, No. 5 Seam.
PO—St. Charles, Va. SP—Same. CTY—Lee. RR—L. & N., V. & S. W.
MS—W. M. Risden.....St. Charles, Va.
SM—Elbert Ashbury, " "
S of H—Mules. Track gauge 44 in.
S of M—Hand.

VIRGINIA CITY COAL CO., INC.

Drift Mine; "Jaw Bone" Seam; 48 to 72 in. thick.
PO—Virginia City, Va. SP—Same. CTY—Wise. RR—Norfolk & Western Ry.
PR—Geo. W. Lambert.Virginia City,Va.
MS—D. E. Lambert, " "
MM—D. E. Lambert, " "
TR—J. T. Wilson....Bluefield, W.Va.
GM—W. T. Williams, " "
PA—W. T. Williams, " "
EM—Roy Wright.....Springton, W.Va.
SM—J. G. Lambert..Virginia City, Va.
S of H—Mules and 1 steam loco. Track gauge 44 in.
S of M—Hand.
PP—1 air comp., 2 pumps.
EMP—50.
Sales agent, Bluefield Coal & Coke Co., Bluefield, W. Va., and Norfolk & Chesapeake Coal Co., Majestic Bldg., Detroit, Mich.
(Old information.)

VIRGINIA IRON, COAL & COKE CO.

PR—John B. Newton....Roanoke, Va.
TR—J. W. Cure, " "
GM—H. K. McHarg, Jr., " "
PA—O. B. Newton, " "
CE—J. W. Beckham, " "
GS—D. A. Patterson ..... Norton, Va.
EM J. A. Deaton....Tom Creek, Va.
EE—S. E. Cabell, " "
Sales agent, C. W. Owen, Roanoke, Va.

Toms Creek Mine, Drift, "Banner" Seam. 84 in. thick.
PO—Toms Creek, Va. SP—Same. CTY—Wise. RR—N. & W.
MS—Greenville Lewis, Toms Creek, Va.
SM—Willoughby Blackard, " "
S of H—Mules and 14 Elec. loco.; track gauge 44 in.
S of M—Hand and 5 Elec. mach.
PP—2 Rust water tube boilers, 6 return tubular boilers, total 1500 H. P., 4 gen. units, 500 volts D. C., 6 pumps.
EMP—1800. Coke Ovens, 800, Bee Hive.

Marion Mine; Drift, "Banner" Seam; 48 in. thick.
PO—Vicco, Va.; SP—Coeburn, Va.; CTY—Wise. RR—N. & W.
MS—R. T. Hopkins ......Vicco, Va.
SM—W. C. Clark .... Vicco, Va.
S of H—Mules and 4 Elec. loco.; track gauge 44 in.
S of M—5 Elec. mach.
PP—2 Pumps. Power from Toms Creek. Mine.
EMP—225.

Looney Creek Mine, Drift, "Imboden" Seam 84 in. thick.
PO—Inman, Va.; SP—Appalachia, Va.; CTY—Wise; RR—V. S. W.
MS—W. M. Huffman......Inman, Va.
SM—F. J. Milgrim ...... Inman, Va.
S of H—Mules and 5 elec. loco. Track gauge 44 in.
S of M—Hand.
PP—4 return tubular boilers, total 600 H. P., 2 gen. units, 550 volts D. C., 3 pumps.
EMP—850.
Coke ovens—176 Bee Hive.
Imperial Mine, Drift, "No.. 6 Black Mountain" Seam, 50 in. thick.
PO—Leona Mines, Va. SP—St. Charles, Va. CTY—Lee. RR—V. S. W., & L. & N.
MS—R. R. Williams...Leona Mines, Va.
SM—R. H. Wagner, " "
S of H—6 elec. loco. Track gauge 44 in.
S of M—4 Elec. mach.
PP—2 Return tubular boilers, total 300 H. P., 1 gen. unit, 500 volts D. C., 4 pumps.
EMP—175.

VIRGINIA-LEE CO., INC. (THE)

Virginia Lee Mine, Drift, No. 5 Seam, 42 to 48 in thick.
PO—St. Charles, Va. SP—Same. CTY—Lee. RR—L. & N., V. & S. W.
PR—Jas. M. Barr, ...Terra Cia, N. C.
VP—A. W. Wagner..St. Charles, Va.
TR—A. W. Wagner, " "
PA—A. W. Wagner, " "
EM—Fox & Peck, ..Big Stone Gap, Va.
S of H—5 elec. loco. Track gauge 44 in.
S of M—Hand and 5 elec. mach.
PP—2 Return tubular boilers, gen. units, 250 volts D. C., and 1 pump.
EMP—250. Last fiscal year output 125,000 tons.
Sales Agency Bewley Darst Coal Co. Bristol, Tenn.

WINIFREDE COAL & COKE CO.

PR—A. E. Carper....East Radford, Va.
VP—W. W. McEleath, " "
No report.

WISE COAL & COKE CO.

General Office, Dorchester, Va.
Dorchester Mines; Drifts; Up. and L. Banner Seam, 60 to 120 in. thick.
PO—Dorchester, Va. SP—Same. CTY—Wise. RR—L. & N., Interstate, N. & W.
PR—J. L. Kemmerer,....New York City
TR—W. E. Decker, " "
GM—D. Terpstra.......Dorchester, Va.
GS—J. H. Neale, " "
EM—F. L. Heinz, " "
CE—F. L. Heinze, " "
MS—J. H. Neale, " "
SM—J. U. Gillenwater, " "
PA—W. W. Kemp.........Norton, Va.
S of H—10 elec. loco. and mules. Track gauge 44 in.
S of M—6 elec. mach.
PP—2 water tube boilers, 2 gen. units, 500 volts D. C., 300 volts A. C., 3 phase, 60 cycles, 2 air comp., 10 pumps.
EMP—500. 450 Bee Hive coke ovens. Last fiscal year output 150,000 tons.
Sales agency, Whitney-Kemmerer Co., Norton, Va.

YELLOW CREEK COAL & COKE CO.

Kilgore Mine, Drift, "Edwards" Seam, 3 to 4½ ft. thick.
PO—Wise, Va. SP—Same. (via Norton, Va.; CTY—Wise; RR—N. & W., L. & N., V. & S. W.
PR—G. D. Kilgore......Norton, Va.
TR—Chas. .T Kilgore .....Wise, Va.
GM—Chas. T. Kilgore, " "
PA—Chas. T. Kilgore, "
SM—Chas. T. Kilgore, " "
GS—V. G. Moore, " "
MS—J. B. Moore, " "
EM—Scarborough & Dodson.Norton, Va.
S of H—Mules. Track gauge 42 in.
S of M—Elec. mach.
EMP—30. Last fiscal year output, 20,269 tons.
Sales Agency. Eastern Coal & Export Corp., Richmond, Va.
(Old information.)

WASHINGTON

For List of Abbreviations See Page 622.

AGNEW FUEL COMPANY.

General Office, Centralia, Wash.
Monarch Mine; 96 in. thick.
PO—Kopiah, Wash; SP—Centralia; CTY Lewis; RR—Eastern Ry. & Lumber Company.
GM—Jay Agnew, Centralia, Wash.
MS—J. G. Parkin, Kopiah, Wash.
S of M—1 comp. air mach.
PP—1 Water tube boiler, total 20 H. P. 1 pump and 1 air compressor.
EMP—5.
Note—Commennced operating Feb. 1st, 1916, under lease from Monarch Coal Company.

AMERICAN COAL CO.

Mines Nos. 6, 8 and 10, Slopes, Seam 4 to 6 ft. thick. Operate washery.
PO—Spiketon, Wash. SP—Same. CTY—Pierce. RR—N. P.
PR—M. V. Reinhart....Seattle, Wash.
GM—D. R. Sivern ....Spiketon, Wash.
PA—M. Oppenheimer, " "
SM—M. Oppenheimer, " "
MS—John Hutchinson,
EM—Edward Gibson, " "
MM—F. H. Cadwell, " "
S of H—Mules and rope. Track gauge 3 ft.
S of M—Hand and 2 comp. air mach.
PP—7 boilers, total 700 H. P., 2 gen. units, 550 volts D. C., 1 air comp, 1 pump.
EMP—280. Last fiscal year output 100,000 tons.
Sales agent, Consumers Fuel Co., Tacoma, Wash.
(Old information.)

BUCODA COAL & DEVELOPMENT CO.

Slopes, "No. 3 Seam," 5½ to 6 ft. thick.
PO—Bucoda, Wash. SP—Same. CTY—Thurston. RR—N. P., G. N., and O. W. R. N., Main Line.
PR—R. A. Graham ....Bucoda, Wash.
TR—W. B. Graham, " "
GM—J. E. Graham, " "
MS—J. E. Graham, " "
GS—E. J. Medley, " "
PA—C. W. Graham, " "
CE—J. T. Graham, " "
EM—J. R. Delameter, " "
S of H—Rope. Track gauge 36 in.
S of M—Hand.
PP—Boiler, 80 H. P., 2 pumps.
Last fiscal year outout 8,000 tons.

BOLCOM-SLIGH COAL CO.

PO—Ballard Station, Seattle, Wash.
PR—Chas. R. Sligh, Grand Rapids, Mich.
TR—W. Yale Henry, Seattle, Wash.

CARBON COAL & CLAY CO.

General Office, Henry Bldg., Seattle, Wash.
Carbon & Daly Mines; Drift and Slope; Carbon Seam; 48 to 72 in. thick; operate washery.
PO—Bayne, Wash. SP—Same. CTY—King. RR—N. P. & C. M. & St. P.
PR—M. B. Daly.......Cleveland, O.
TR—S. H. Tollas......Cleveland, Ohio.
GM—D. S. Hanley......Bayne, Wash.
PA—D. S. Hanley, .. " "
MS—M. C. Butler, " "
SM E. J. Moore, " "
S of H—3 elec. loco. Track gauge 36 in.
S of M—Hand.
PP—3 Erie water tube boilers, total 450 H. P., 2 gen. units, 250 volts D. C.
EMP—125. Last fiscal year output, 60,000 tons.

CARBON HILL COAL CO.

Slope. Operate washery.
PO—Carbonado, Wash. SP—Same. CTY—Pierce. RR—N. P.
PR—Wm. H. Crocker, San Francisco, Cal.
SECY—Geo. Stimmel, " "
GM—S. F. B. Morse, " "
MGR—J. F. Menzies, Carbonado, Wash.
EM—Frank Good, " "
ASST PA—P. D. Richards, " "
MM—Charles La Caste, " "
EE—J. A. Cailier, " "
SCO—Carbon Hill Coal Co. Buyer, E. A. Wright, Carbonado, Wash.
S of H—Mules, rope, 7 elec. and 7 steam locos. Track gauge 36 in.
S of M—Hand.
PP—7 Erie City return tubular boilers, 3 gen. units, 550 volts D. C.
EMP—600. Coke ovens, 71 Bee Hive.
Sales agent, W. E. Pearce, Seattle, Wash.

CENTRAL COAL CO.

General Office, Crary Bldg., Seattle, Wash.
Grand Ridge Mine; Slope; Seam 48 to 144 in. thick; Operate Washery.
PO—Issaquah, Wash.; SP—Grand Ridge, Wash.; CTY—King; RR—N. P., North Bend Branch.
PR—C. J. Smith, ...Seattle, Wash.
TR—A. S. Kerry, " "
CE—H. F. Hawkins, " "
GM—A. Reynolds, ...Issaquah, Wash.
GS—A. Reynolds, " "
MS—J. J. Reynolds, " "
S of H—Mules.
S of M—7 Comp. air mach.
PP—2 Return tubular boilers, 1 compressor. Power purchased.
EMP—100. Developed to mine 600 tons daily, if needed.
Sales Manager, F. C. Ferree.

DENNY-RENTON CLAY & COAL CO.

General Office, 1002 Hage Building, Seattle, Wash.
Taylor Mine; Shaft and Drift. Operate washery.
PO—Taylor, Wash; SP—Same; CTY—King; RR—Pacific Coast.
PR—Moritz Thomsen......Seattle, Wash.
VPR—E. J. Mathews....Seattle, Wash.
TR—E. J. Matthews, " "
Asst. TR—F. A. Shillestad " "
SECY J. F. Keenan, " "
Asst. Sec—F. A. Shillestad " "
GM—J. F. Keenan, " "
PA—G. Lingren, " "
SM—G. Lingren, " "
Asst. MGR—H. S. Smith..Portland, Ore.
MS—Wm. Lawton.......Taylor, Wash.
EE—Harvey Race, " "
W. E. Lemley, Taylor, Wash and W. L. Bryan, Seattle, Wash.
S of H—2 elec. loco. Track gauge 36 in.
S of M—Hand.
PP—3 Sterling water tube and 5 return tubular boilers, total 600 H. P., 3 gen. units, 250 volts D. C., 1 air comp., 1 pump.
Sales agent, S. R. Strong, Seattle, Wash.
Note—Use output at plant.

DURHAM COLLIERY CO.

General Office, Tacoma, Wash.
PO—Durham, Wash.; SP—Same; CTY—King; RR—N. P., Green River Br. Operate washery.
PR—C. R. Claghorn, Durham, Wash.
GM—C. R. Claghorn, " "
TR—C. A. Foster, Tacoma, Wash.
S of H—Mules.
S of M—Hand.
PP—2 Return Tubular Boilers; total, 150 H.P., Gen. Unit, 440 volts A. C., 3 Phase, 60 Cycles
Sales Agent, C. A. Foster, Tacoma, Wash.

EAST CREEK COAL CO.

General Office, Tacoma, Wash.
Mine No. 1, Drift, No. 3 Seam, 7 to 8 ft. thick.
PO—Ladd, Wash. SP—Same (Prepay). CTY—Lewis. RR—T. E., Ladd Branch.
PR—John Bagley ......Tacoma, Wash.
TR—J. G. Dickson......Tacoma, Wash.
PA—G. D. Newbegin......Ladd, Wash.
S of H—2 steam loco. Track gauge 36 in.
S of M—Hand.
PP—1 return tubular boiler, total 200 H. P., 1 gen. unit, 120 volts D. C.
EMP—6.

FAIRFAX MINE, INC.

Fairfax Mine, Drift and Slope, Seam 4 to 8 ft. thick. Operate washery.
PO—Fairfax, Wash. SP—Same. CTY—Pierce. RR—N. P., Buckley Br.
PR—W. R. Rust, Box 1605, Tacoma, Wash.
GS—G. E. Rockefeller..Fairfax, Wash.
PA—G. E. Rockefeller, " "
CE—G. E. Rockfeller, " "
MM—M. Jonis, " "
EE—M. Jonis, " "
SCO—D. E. Brehm & Bros., Buyer C. T. Brehm, Fairfax, Wash.
S of H—2 elec. loco. Track gauge 26 in.
S of M—Hand.
PP—2 boilers, total 300 H. P., 2 gen. units, 500 volts D. C., 1 air comp., 1 pump.
EMP—100. Coke Ovens, 60, Bee Hive. Last fiscal year output, 38,426 tons.

FORD'S PRAIRIE COAL CO.

Ford's Prairie Mine; Slope; Seam 66 to 96 in. thick.
PO—Centralia, Wash. SP—Same. CTY—Lewis. RR—N. P.
PR—A. D. Foron ....Centralia, Wash.
TR—Henry Foron, " "
GM—A. D. Foron, " "
MF—R. Tarrach, " "
S of H—Mules and 1 steam loco.
S of M—Hand.
PP—2 Return tubular boilers, 100 H. P.
EMP—7. Last fiscal year output, 7,134 ons.

GALE CREEK COAL CO.

Gale Creek Mine; Slope; Seam 48 in. thick.
PO—Wilkeson, Wash.; SP—Same; CTY—Pierce; RR—N. P., Wilkeson Branch.
PR—Henry Hewitt, Jr., Tacoma, Wash.
TR—J. J. Hewitt, " "
GS—J. T. Lee, ...Wilkeson, Wash.
SCO—Barton Bros., " "
S of H—1 Elec. loco.; track gauge 36 in.
S of M—Hand.
PP—2200 volts A. C., 3 phase, 60 cycles. Power purchased.
EMP—60. Last fiscal year output 30,000 tons.

HYDE COAL CO.

General Office, 122 King Street, Seattle, Wash.
Hyde Mine; Slope; McKay Seam, 52 to 56 in. thick. Operate washery.
PO—Cumberland, Wash.; SP—Rosemar Spur, Wash.; CTY—King; RR—N. P. Palmer Branch.
PR—Samuel Hyde, ...Seattle, Wash.
VPR—Philip Rowe, " "
Sec.—Maurice McMicken, " "
PA—Hallidie Machinery Co., Seattle, Wash.
CE—George Watkins Evans, Seattle, Wash.
MS—Wm. R. Reese, Crumbeland, Wash.
S of H—Mules.
S of M—Hand.
PP—2 Frost return boilers, total 250 H.P., 2 gen. units 240 volts A.C., 3 phase, 60 cycles.
EMP—100. Output 10,000 tons.
Note—Idle at present. Expect to resume shortly.

INDEPENDENT COAL & COKE CO.

General Office, 607 Lowman Bldg., Seattle, Wash.
Independent Mine; Slope; Roslyn Seam; 54 in. thick.
PO—Cle Elum, Wash.; SP—Same; CTY Kittitas; RR—N. P.
MS—Robert Scobie....Cle Elum, Wash.
S of H—Rope.
S of M—Hand.
PP—3 water tube boilers, total 500 H. P., 1 gen. unit, 440 volts A. C., 3 phase, 60 cycles, 2 pumps.
Note—Just commencing operations.

ISSAQUAH & SUPERIOR COAL MINING CO., LTD.

General Office, 908 White Bldg., Seattle, Wash.
Drift Mine, Alvo No. 5, Muldoon.
PO—Issaquah, Wash. SP—Same. CTY—King. RR—N. P.
PR—A. R. Alvensleben. Vancouver, B.C
TR—J. H. Young, " "
GM—Walter Barly .....Seattle, Wash
GS—Walter Barly, " "
PA—L. W. Norman, " "
CE—Walter Barly, " "
MM—Andrew Neil, " "
MF—John Jones ......Issaquah, Wash
S of H—2 elec. loco.
S of M—24 comp. air mach.
PP—2 air comp.
EMP—300. Last fiscal year output 150,000 tons.
Sales agency, J. F. Grant, 908 White Bldg., Seattle, Wash.
(Old information.)

MENDOTA COAL & COKE CO.

General Office, Centralia, Wash.
Mine No. 1, Slope, No. 3 Seam, 10 ft. thick. Operate washery.
PO—Mendota, Wash. SP—Same. CTY—Lewis. RR—C. E.
PR—B. H. Johnston..Centralia, Wash.
TR—B. H. Johnston, " "
GM—B. H. Johnston, " "
EM—Frank C. Knowles, " "
MS—T. E. Martin.....Mendota, Wash.
S of H—Rope and mules. Track gauge 3 ft.
S of M—Hand
PP—2 return tubular boilers, total 500 H. P., 1 pump.
EMP—125. Last fiscal year output 41,431 tons.
Sales agent, B. H. Johnston, Centralia, Wash.

MONARCH COAL COMPANY.

General Office, 530 Chamber Commerce Bldg., Portland, Ore.
Monarch No. 1 Mine; Slope; Seam 90 in. thick.
PO—Kopiah, Wash.; SP—Centralia, Wash.; CTY—Lewis; RR—Eastern Ry & Lumber Co.
PR—Conrad P. Olson..Portland, Oregon
TR—Frank Anderson, " "
GS—J. S. Kriebel.....Centralia, Wash.
EM—F. C. Knowles,..Centralia, Wash.
PA—David E. Lofgren....Portland, Ore.
S of H—Rope and mules.
S of M—Hand.
PP—1 Water Tube Boilers.
EMP—20. Last Fiscal year output 6,000 tons.
Note—Leased mine, February 1st, 1916, to Agnes Fuel Co.

MONTEZUMA COAL MINES CO.

See Washington, Manganese Coal & Copper Co.

NATIONAL COAL CO Inc.

General Office, 323-4 Railway Exchange Bldg., Seattle, Wash.
National Mine; 2 Slope and 2 Drift, Nos. 2, 0, and McKay Seams, 40 to 72. in. thick.
PO—Cumberland, Wash.; SP—Naco; CTY—King; RR—C. M. & S. P., N. P.
PR—Stephen H. Green....Seattle, Wash.
GM—Stephen H. Green, " "
PA—Stephen H. Green, " "
GS—Edwin Husband..Cumberland, Wash.
EM—J. L. Parry, " "
MM—A. Angwin, " "
MS—Geo. Stonebridge, " "
S of H—1 Steam, 1 gasoline loco. and rope; track gauge 36 in.
S of M—3 Comp. air mach.
PP—6 return tubular boilers, total 550 H. P., 1 compressor, 3 pumps.
EMP—70. Output 28,052 tons.
Sales Agent, A. S. Elmore, Seattle, Wash.

NORTHWESTERN IMPROVEMENT CO.

General Office, Tacoma, Wash.
Five mines in Washington, 2 in Montana.
PR—Wm. P. Clough..New York, N.Y.
VP—T. Cooper ......St. Paul, Minn
TR—C. A. Clark, " "
PA—D. S. Kinney.......Tacoma, Wash.
PA—F. G. Prest, " "
GM—C. C. Andersen...Tacoma, Wash.
Comptroller, M. P. Martin, Tacoma, Wash.
MM—E. W. McCanna.....Roslyn, Wash.
EM—George Rigg, " "

Roslyn Nos. 3 and 6 Mines; Shaft; Drift; and Slope; Roslyn Seam;
PO—Roslyn, Wash. SP—Same. CTY—Kittitas. RR—N. P.
MS—Peter Bagley ......Roslyn, Wash.
S of H—Mules, rope and elec. loco.
S of M—Hand.

Cle Elum Mine, Slope.
PO—Cle Elum, Wash. SP—Same. Kittitas. RR—N. P.
MS—Arthur Hodder.....Cle Elum, Wash.
S of H—Mules, rope and elec. loco.
S of M—Hand.

Nos. 5 and 7 Mines, Slopes.
PO—Roslyn, Wash. SP—Same. CTY—Kittitas. RR—N. P.
MS—A. Odder..........Roslyn, Wash.
S of H—Mules, rope and elec. loco.
S of M—Hand.

Mines at Ravensdale and Melmont abandoned.

OCCIDENTAL COKING COAL CO.

General Office, Centralia, Wash.
Occidental Mine, Slope, Nos. 5 tnd 6 Seam, 37 ft. thick. Operate washery.
PO—Bayne, Wash. SP—Same. CTY—King. RR—N. P., C. M. & S. P.
PR—H. B. Scott........Burlington, Ia.
VP—B. H. Johnston..Centralia, Wash.
GS—B. H. Johnston, " "
PA—B. H. Johnston, " "
EM—F. C. Knowles, " "
S of H—Steam and mules. Track gauge 3 ft.
S of M—Hand.
EMP—35.
Idle at present.

OZARK COAL MINING CO.

General Office, Tacoma, Wash.
Navy Mine; Drift and Slope; Navy Seam 48 in. thick. Operate washery.
PO—Cumberland, Wash.; **SP**—Same; **CTY**—King; **RR**—N. P., Buckley Br.
PR—W. T. Bobo....Battle Creek, Mich.
TR—L. E. Stewart
GM—D. W. Watkins, Cumberland, Wash.
PA—D. W. Watkins, " "
EM—W. J. Woods " "
MF—Jake Ondrius, " "
S of H—Mules. (Changing to electric.)
S fo M—Hand.
PP—1 pump.
EMP—100. Output daily, 200 tons. Sales Agent, C. A. Paps, Seattle, Wash.
Successors to Naval Coal Co. and Scranton Coal Mining Co.

PACIFIC COAST COAL CO.

General Office, Seattle, Wash.
PR—J. C. Ford.........Seattle, Wash.
GM—J. C. Ford, " "
TR—J. W. Smith, " "
PA—W. E. Nichols, " "
Chief Eng—N. D. Moore, " "
EM—Ray Smith, " "
Mech. Eng—Robt R. Sterling, " "
SCO—Pacific Coast Coal Co. Buyer, C. P. Blanchard, Seattle, Wash.
Mgr. of Mines—Wm. Hann, Black Diamond, Wash.
EE—J. H. Crooks, Black Diamond, Wash.
Sales Agency, N. Poston, Seattle, Wash.
Coal Creek Mine; Slope; Muldoon Seam, 46 to 72 in. thick. Operate washery.
PO—New Castle, Wash.; **SP**—Coal Creek, Wash; **CTY**—King; **RR**—C. & P. S. New Castle Br.
MS—J. J. Jones....New Castle, Wash.
SM—R. C. Shane, " "
S of H—7 Elec. loco.; track gauge 36 in.
S of M—36 comp. air mach.
PP—9 Return tubular boilers, toal 1275 H. P., 1 gen. unit 500 volts D. C., 2 compressors, 4 pumps.
EMP—315. Last fiscal year output 287,047 tons.

No. 11 Mine; Slope; McKay Seam, 42 to 66 in. thick. Operate washery.
PO—Black Diamond, Wash.; **SP**—Same; **CTY**—King;; **RR**—C. & P. S.
MS—R. Christiansen, Black Diamond, Wash.
SM—E. P. Botting, Black Diamond, Wash.
S of H—10 elec. loco. and rope. Track gauge 36 in.
S of M—Hand.
PP—13 Return tubular boilers, total 1900 H. P., 4 gen. units 500 volts D. C., 15 pumps.
EMP—429. Last fiscal year output 185,600 tons.

Burnett Mine; Slope, Nos. 1, 2 and 3 Seam, 40 to 60 in. thick. Operate washery.
PO—Burnett, Wash.; **SP**—Same; **CTY**—Pierce; **RR**—N. Pac.
MS—W. E. Maltby....Burnett, Wash.
SM—O. L. Stephens, " "
S of H—6 elec. loco., and steam loco. Track gauge 36 in.
S of M—4 Comp. air mach.
PP—8 Return tubular boilers, total 1000 H. P., 4 gen. units, 500 volts D C., 4 compressors, 6 pumps, also purchase power.
EMP—219. Last fiscal year output 91,892 tons.

No. 14 Mine; Slope, McKay Seam, 48 to 72 in. thick.
PO—Black Diamond, Wash.; **SP**—Same; **CTY**—King; **RR**—C. & P. S.
MS—R. Christiansen, Black Diamond, Wash.
SM—Evan P. Botting, Black Diamond, Wash.
S of H—3 Elec. loco.; track gauge 36 in.
S of M—Hand.
PP—5 Return tubular boilers, total 480 H. P., gen. units 500 volts D. C., 10 pumps.
EMP—139. Last fiscal year output 24,346 tons.

Nos. 12, 14 and B Mines closed.

POCAHONTAS COAL & COKE CO.

General Office, 509 White Bldg., Seattle, Wash.
Pocahontas Mine; Tunnel and Slope; Pocahontas Seam, 5 ft. to 35 ft. thick. Operate washery.
PO—Palmer, Wash.; **SP**—Pocahontas, Wash.; **CTY**—King; **RR**—N. P.
PR—J. R. Miller,.....Seattle, Wash.
TR—J. R. Miller, " "
GM—J. R. Miller, " "
CE—James A. Kelly, " "
EM—James A. Kelly, " "
PA—J. E. Slorah, " "
SM—J. E. Slorah, " "
MS—B. H. Myers.......Palmer, Wash.
MM—B. H. Myers, " "
GS—B. H. Myers, " "
S of H—Mules and rope.
S of M—Hand.
PP—1 Return tubular boiler, 60 H.P. gen. unit 250 volts D.C.
EMP—45. Last fiscal year output 20,000 tons.

PUGET SOUND TRACTION LIGHT & POWER CO.

General Office, Seattle, Wash.
Renton Coal Mine, Slope, "Renton No. 3" Seam, 7 ft. thick. Operate washery.
PO—Renton, Wash. **SP**—Same. **CTY**—King. **RR**—N. P., C. M. & P. S., Puget Sound Electric, and P. C.
PR—A. W. Leonard....Seattle, Wash.
TR—Frank Dabney, " "
GM—A. L. Kempster, " "
PA—W. B. Donaldson, " "
MS—Lewis D. Jones ..Renton, Wash.
MM—D. C. Williams, "
EM—M. E. Clark......Renton, Wash.
S of H—Mules, rope and 3 elec. loco. Track gauge 36 in.
S of M—1 elec mach.
PP—6 return tubular boilers, 2 gen. units, 550 volts D. C., 3 pumps.
EMP—216. Last fiscal year output 120,950 tons.
Sales agent, J. W. Bullock, 609 10th Ave., Seattle, Wash.

ROSLYN-CASCADE COAL CO.

General Office, S. Bellingham, Wash.
PR—F. P. Larrabee...So. Bellingham, Wash.
TR—Cyrus Gates, So. Bellingham, Wash
GM—Wm. Mackay .....Roslyn, Wash.
PA—Wm. Mackay, " "
EM—Jas. E. Ash, " "
Sales agent, John Ryczek, Roslyn, Wash.
Mine No. 1, Slope, "Roslyn Bed" Seam, 4 ft. 4 in. to 4 ft. 6 in. thick.
PO—Roslyn, Wash. **SP**—Ronald, Wash. **CTY**—Kittitas. **RR**—N. P., Roslyn Branch.
MS—Robt Scobie.......Roslyn, Wash.
S of H—Mules, gravity and steam. Track gauge 30 in.
S of M—Hand and 1 elec. mach.
PP—1 Boiler, 50 H. P.
EMP—114. Last fiscal year output 107,719 tons.

Mine No. 2 Slope, "Roslyn Bed" Seam, 4 ft. 4 in. to 4 ft. 6 in. thick.
PO—Roslyn, Wash. **SP**—Ronald, Wash. **CTY** — Kittitas. **RR**—N. P., Roslyn Branch.
MS—Jas. Ash ....Roslyn, Wash.
S of H—Mules and gravity. Track gauge 30 in.
S of M—Hand.
PP—2 boilers, total 100 H. P., 1 gen. unit, 445 volts A. C., 60 cycles.

ROSLYN COAL & COKE CO.

No. 2 Mine; Slope; 48 to 56 in. thick.
PO—Roslyn, Wash.; **SP**—Lakedale; **CTY**—Kittitas; **RR**—N. P., Roslyn Br.
PR—George H. Reed.....Tacoma, Wash.
TR—A. F. Plant.......Roslyn, Wash.
S of H—Steam loco.
S of M—Hand.
PP—2 gen. units, 3 pumps.

ROSLYN FUEL CO.

General Office, 607 Lowman Bldg., Seattle, Wash.
PR—Prescott Oakes......Seattle, Wash.
TR—Prescott Oakes, " "
GM—Charles E. Jones, " "
EM—Charles E. Jones, " "
PA—A. G. Clarke, " "
MM—Harry Mowesey, " "

Beekman No. 1 Mine; Slope; Roslyn Seam; 48 to 60 in. thick. Operate washery.
PO—Roslyn, Wash.; **SP**—Same; **CTY**—Kittitas; **RR**—N. P., Roslyn branch.
MS—Thos. Miller.......Roslyn, Wash.
S of H—Mules, rope and elec.
S of M—Hand.
PP—3 B. & W., water tube boilers, total 750 H. P., 2 gen. units, 440 volts A. C., 3 phase, 60 cycles, 2 pumps.
EMP—200. Last fiscal year output 250,000 tons.

Beekman No. 2 Mine; Slope; Roslyn No. 1 Seam; 60 in. thick.
PO—Roslyn, Wash.; **SP**—Same; **CTY**—Kittita; **RR**—N. P., Roslyn branch.
MS—William Shaw......Roslyn, Wash.
S of H—Mules, rope and elec.
S of M—Hand.
PP—2 B. & W. water tube boilers, total 400 H. P., 1 gen. unit, 440 volts A. C., 3 phase, 60 cycles, 4 pumps.
EMP—185. Last fiscal year output 150,000 tons.

Summit Mine; Drift; Roslyn Seam; 54 in. thick.
PO—Cle Elum, Wash.; **SP**—Same; **CTY**—Kittitas; **RR**—N. P.
MS—Robert Scobie....Cle Elum, Wash.
S of H—Mules, rope and gravity.
S of M—Hand.
PP—2 return tubular boilers, total 180 H. P.
EMP—60. Last fiscal year output 10,000 tons.

SHELDON COAL CO.

Sheldon Mine.
PO—Chehalis, Wash. **CTY**—Lewis.
PR—W. D. Sheldon...Chehalis, Wash.
GS—B. H. Sheldon, " "
EMP—8. Last fiscal year output 2,100 tons.
State report.

SUPERIOR COAL CO.

Superior Mine; Slope; 120 in. thick.
PO—Chehalis, Wash.; **SP**—Same; **CTY**—Lewis; **RR**—N. P.
PR—J. G. Murphy....Chehalis, Wash.
MS—Mat Parker.......Chehalis, Wash.
S of H—Rope and steam loco.
S of M—Hand.
PP—1 water tube boiler, 65 H. P., 1 gen. unit, 220 volts A. C., 60 cycles, 1 pump.
EMP—16. Last fiscal year output 11,560 tons.

SOUTH WILLIS COAL CO.

Winson Mine; Slope; 40 to 54 in. thick. Operate washery.
PO—Spiketon, Wash.; **CTY**—Pierce **RR**—N. P., Wilkeson & Burnett Br.
PR—Abe Morris.......Spiketon, Wash.
GS—Frank Merritt, " "
GM—Frank Merritt, " "
PA—Frank Merritt, " "
MS—Jonas Morris, " "
TR—John Morris, " "
MM—B. W. Wesbo, " "
EE—B. W. Wesbo, " "
SM—A. A. Bovey, " "
S of H—Mules and 1 elec. loco. Track gauge 36 in.
S of M—Hand.
PP—5 return tubular boilers, 550 volts D. C., 1 air comp. and 2 pumps.
EMP—50. Last fiscal year output 14,000 tons.

WASHINGTON MANGANESE, COAL & COPPER CO.

General Office, 421 Railway Exchange Bldg., Seattle, Wash.
Marcy Mine; Slope; Montezuma Seam, 30 to 108 in. thick. Operate washery.
Montezuma Mine; Water level; Montezuma Seam; Operate washery.
PO—Fairfax, Wash.; **SP**—Same; **CTY**—Pierce; **RR**—N. P.
PR—H. O. Marcy........Boston, Mass.
TR—F. B. Chandler.....Seattle, Wash.
GS—Geo. Savage,.......Fairfax, Wash.
EM—Geo. Savage " "
PA—D. Shoudy.........Seattle, Wash.
GM—D. Shoudy, " "
MM—F. H. McPherson...Fairfax, Wash.
EE—F. H. McPherson, " "
CE—J. R. Marshall.....Loomis, Wash.
SCO—Washington Mang. C. & C. Store. Buyer, D. A. Armstrong, Fairfax, Wash.
S of H—2 elec. locos. Track gauge 42 in.
S of M—2 compressed air and 1 elec. mach.
PP—2 air compressors, 6 gen. units, 500 volts D. C.
EMP—60. 25 Bee Hive coke ovens, rectangular. Sales Agency, Washington Manganese, Coal & Copper Co.
Note—Successors to Montezuma Mines Co.

WASHINGTON UNION COAL CO.

General Office, Omaha, Neb.
Tono Mine, Slope and Drift, Hannaford Seam, 15 ft. thick.
PO—Tono, Wash. **SP**—Same. **CTY**—Thurston. **RR**—O. W. R. & N., Tono Branch.
PR—F. A. Manley .....Omaha, Neb.
[illegible] Hoone ....Cheyenne, Wyo.
[illegible] J. Brooks ......Tono, Wash.
[illegible] E. J. Brooks, " "
[illegible]—R. B. [illegible], " "
MM—A. Turnball,
EE—A. Turnball, " "
SCO—Tono Store. Buyer, F. O. Nelson, Tono, Wash.
S of H—Mules, rope and 2 gaso. loco. Track gauge 30 in.
S of M—Hand.
PP—2 Marme return tubular boilers, total 300 H. P., 1 gen. unit, 2,300 volts A. C., 3 phases, 60 cycles, 3 elec. pumps.
EMP—175. Last fiscal year output 109,000 tons.
Sales agent, A. C. Gillespie, Portland. Ore.

WHATCOM COUNTY COAL CO.

Blue Canyon Mine, Drift Blue Canyon Seam 24 to 240 in. thick. Operate washery.
PO—Bellingham, Wash. R.D. No. 3. **SP**—Blue Canyon, Wash.; **CTY**—Whatcom; **RR**—N. P.
PR—R. C. Clise ......Seattle, Wash.
TR—A. M. Hadley....Bellingham, Wash.
GM—Andrew Eclklund..Bellingham, Wash. R. D. No. 3.
S of H—Gravity. Track gauge 30 in.
S of M—Hand and 2 comp. air mach.
PP—Water power, 1 air comp.
EMP—18. Last fiscal year output 7,500 tons.
Sales agent, Turnkey & Sons, Bellingham, Wash.

WILKESON COAL & COKE CO.

Wilkeson Mine, Drift, Wilkeson Seam, 18 in. to 6 ft. thick. Operate washery.
PO—Wilkeson, Wash. **SP**—Same. **CTY**—Pierce. **RR**—N. P. Ry.
PR—Henry Hewitt, Jr., Tacoma, Wash.
GS—J. T. Lee.......Wilkeson, Wash.
S of H—Mules and 5 steam locos. Track gauge 36 in.
S of M—Hand.
EMP—200. Last fiscal year output 110,900 tons.
Coke ovens, 125 Bee Hive.

WEST VIRGINIA

For List of Abbreviations See Page 622.

ABRAMS CREEK COAL & COKE CO.
Oakmont Mine; Drift; Upper Freeport Seam; 48 to 52 in. thick.
PO—Oakmont, W. Va.; SP—Same; CTY—Mineral; RR—Western Maryland, Elk Garden Br.
PR—S. D. Brady....Fairmont, W. Va.
TR—A. P. Brady, " "
MS—James Christopher..Oakmont, W.Va.
EE—James Christopher, " "
SCO—Company Store, buyer, Earl Blaker, Oakmont, W. Va.
S of H—1 Elec. and 1 Storage Battery loco.; track gauge 42 in.
S of M—Hand and 5 Elec. mach.
PP—Boilers, 150 H. P.
EMP—175.

AJAX COAL CO.
Ajax Mine; Drift; Sewell Seam; 30 to 42 in. thick.
PO—Fayette, W. Va.; SP—Newlyn, W. Va.; CTY—Fayette; RR—C. & O. Main Line.
PR—S. M. Dunbar....Fayette, W. Va.
GM—S. M. Dunbar, " "
TR—J. T. McMasters, " "
PA—Aaron Carver, " "
MS—J. G. Clements, " "
EM—J. H. Jackson, " "
SCO—Ajax Coal Co. Store. Buyer, S. B. Baley, Fayette, W. Va.
S of H—1 Elec. loco.; track gauge 40 in.
PP—2 pumps.
EMP—70. Last fiscal year output 40,000 tons. Sales agency, W. Va. Coal Co.
Successors to Manufacturers & Consumers Coal Co.

AJAX-HOCKING COAL COMPANY
General Office, Baltimore, Md.
Two mines in West Virginia, 5 mines in Pennsylvania.
PR—Richard M. Duvall, Baltimore, Md.
TR—Edwin W. Adams, " "
GM—James G. Pugh, " "
PA—James G. Pugh, " "
GS—D. J. Riordan......Houtzdale, Pa.
SM—Frank Getty......Gleason, W. Va.

Hubbard Mine; Drift; Kittanning Seam; 72 in. thick.
PO—Gleason, W. Va.; SP—Hubbard; CTY—Mineral; RR—Western Md., Elk Garden & W. Va. Div.
S of H—Mules.
S of M—Hand.

Emoryville Mine; Drift; Bakerstown Seam; 48 in. thick.
PO—Gleason, W. Va.; SP—Hubbard; CTY—Mineral; RR—Western Md., Elk Garden & W. Va. Div.
S of H—Mules.
S of M—Hand.
Note—Consolidation of Ajax Cons. Coal Co. and Hocking Coal Co.

ALEMMA COAL CO.
Drift Mine; No. 2 Gas Seam, 96 to 102 in. thick.
PO—Switzer, W.Va.; SP—Same; CTY—Logan; RR—C. & O., L. & S. Branch.
PR—J. M. Vest, ...Switzer, W.Va.
GM—J. M. Vest, " "
TR—Fred Prichard..Huntington, W. Va.
S of H—Mules, track gauge 48 in.
S of M—1 Elec. mach.
PP—Power purchased; 1 gen. unit 250 volts D.C.
Sales Agency, Island Creek Coal Co., Switzer, W.Va.

AILEEN COAL CO.
General Office, Mt. Hope, W. Va.
Aileen Mine; Slope, Sewell Seam, 40 in. to 60 in. thick.
PO—Keeneys Creek, W. Va.; CTY—Fayee; RR—C. & O.
PR—W. E. Deegans....Mt. Hope, W.Va.
TR—John Faulkner, " "
GM—Wm. Farrell..Keeneys Creek, W.Va.
PA—Wm. Farrell, " "
MS—Wm. Farrell, " "
SCO—Address the Company, " "
CE—Philip Konrad, Kanawha Falls, W.Va.
S of H—1 Storage battery, loco and mules.
S of M—1 Elec. mach. and hand.
PP—Gen. units 250 volts D. C., power purchased.
EMP—75. Last fiscal year output 30,000 tons.
Successors to the Holliday Coal Co.

ALGOMA COAL & COKE CO.
Piney and Northfork, Drifts, Poca. Seam No. 3.
PO—Algoma, W. Va. SP—North Fork, W. Va. CTY—McDowell. RR—N. & W.
GM—Wm. J. Beury, 3432 N. 17th St., Philadelphia, Pa.
ResMgr—J. J. Huddleston. Algoma, W.Va
PA—B. F. Frame, " "
EM—G. Wilcox, " "
MS—J. F. Logan, " "
SM—W. L. Craft.....Algoma, W.Va.
S of H—Elec. loco.
S of M—Hand.
PP—Gen. units, 250 volts A. C.
Coke Ovens, 225.
EMP—300.

ALGONQUIN COAL CO.
General Office, Matoaka, W.Va.
Drift Mine; No. 3 Poca. Seam, 60 in. thick.
PO—Algonquin, W.Va.; SP—Same; CTY—Mercer; RR—N. & W., Virginian.
PR—J. A. Renehan, No. 1 Broadway, New York, N.Y.
Secy—A. H. Dary, No. 1 Broadway, New York, N.Y.
GM—J. H. Parrott, McComas, W.Va.
PA—J. C. Stras, ...Matoaka, W.Va.
MS—J. C. Stras, " "
S of H—1 Elec. loco.; track gauge 48 in.
S of M—Elec. mach.
PP—Power purchased.

ALMA-THACKER FUEL CO.
General Office, Columbus, O.
Drift Mine; Freeport, Thacker, Alma, Freeburn Seam 54 in. thick.
PO—McCarr, Ky.; SP—McCarr Siding, W. Va.; CTY—Mingo; RR—N. & W., Tug River & Ky.
PR—C. Cohenour, Columbus, O.
GM—C. Cohenour, " "
PA—C. Cohenour, " "
TR—D. N. Postlewaite. Columbus, O.
MS—G. W. Coyle.........McCarr, Ky.
SM—G. E. Goodspeed, " "
S of H—5 elec. locos. Track gauge 48 and 56½ in.
S of M—4 Elec. Mach.
PP—2 motor generator sets, 150 K. W., 3 phase, 60 cycles.
Successors to the Pomeroy Fuel Co.

ALPHA-POCAHONTAS COAL CO.
Alpha Mine; Drift, Beckley Seam, 54 to 72 in. thick.
PO—Alpoca, W. Va.; SP—Same; CTY—Wyoming; RR—Virginian.
PR—F. M. Lee........Alpoca, W.Va.
GM—F. M. Lee, " "
PA—F. M. Lee, " "
TR—G. H. Wilkins, " "
EM—J. P. Irwin, " "
SM—W. L Cox. " "
CE—E. M. Merrill......Beckley, W.Va.
S of H—1 elec. loco.
S of M—2 elec. mach.
PP—Gen. units 250 volts D. C., 440 volts A. C., 3 phase, 60 cycles.

AMERICAN COAL CO.
General Office, No. 1 Broadway, New York.
PR—W. De L. Walbridge, Broadway, New York.
TR—Geo. M. Bowlby, Broadway, New New York.
GS—J. H. Parrott McComas, W. Va.
PA—J. H. Parrott, " " "
EM—C. H. Bloom, " "
SB—J. Tracy Walker, " " "

PINNACLE Mine, Drift No. 3, Pocahontas Seam, 4 ft. 8 in. thick. Operate washery.
PO—McComas, W. Va. SP—Mora, W. Va. CTY—Mercer. RR—N. & W. Crane Creek Branch.
MS—J Tracy Walker, McComas, W Va.
S of H—Mules and 3 elec. loco. Track gauge 48 in.
S of M—Hand and 5 elec. machines.
PP—7 boilers, 875 H.P. 3 Gen. units, 550 volts D.C.
EMP—325—Last fiscal year output, 266.865 tons. Coke ovens, 200 Bee Hive.

Crane Creek Mine, Drift No. 3, Pocahontas Seam, 4 ft. 8 inches thick. Operate washery.
PO—McComas, W. Va. SP—Mora, W. Va. CTY—Mercer. RR—..N. & W., Crane Creek Branch.
S of H—Mules and 3 elec. loco. Track gauge 44 inches.
S of M—Hand. and 5 elec. machines.
PP—Elec. for inside furnished by Pinnacle Mine. Buy power for outside work.
EMP—350. Last fiscal year output 296,633 tons. Coke ovens, 200 Bee Hive.

Piedmont Mine, Drift, No. 3 Pocahontas Seam, 4 ft. 6 in. thick.
PO—Widemouth, W. Va.; SP—Same; CTY—Mercer; RR—N. & W., Widemouth Br.
S of H—Mules, 1 elec. and 1 steam loco. Track gauge 56½ inches. inches.
S of M—7 Elec. machines.
PP—Buy power.
EMP—175. Last fiscal year output 144,657 tons.

AMIGO COAL COMPANY
General Office Amigo, W. Va.
Drift Mine; Pocahontas No. 3 Seam; 36 to 54 in. thick.
PO—Amigo, W. Va.; SP—Same; CTY—Raleigh; RR—Virginian.
PR—W. W. Koiner....Sullivan, W. Va.
TR—J. A. Wood........Pratt, W. Va.
GM—Fred G. Wood,.....Amigo, W. Va.
PA—Fred G. Wood, " "
CE—Fred G. Wood, " "
EM—J. D. Duval, " "
SM—K. S. McClanahan, " "
S of H—Elec. locos. Track gauge 44 in.
Output 1,700 tons. Just developing mine.

ANCHOR COAL CO.
Anchor Mine, Drift, Seam 7 to 9½ ft. thick.
PO—Highcoal, W. Va. SP—Same. CTY—Boone. RR—Chesapeake & Ohio, Coal River Extension, Cabin Creek Branch.
PR—Lute Hornickel.....Cleveland, O.
TR—Lute Hornickel, " "
GM—Lute Hornickel, " "
PA—Lute Hornickel, " "
GS—G. H. Hornickel. Highcoal, W. Va.
EM—J. E. B. Eaton..Charleston, W. Va.
SM—G. E. Downer...Highcoal, W. Va.
S of H—6 elec. locos. Track gauge 42 in.
S of M—5 elec. mach.
PP—3 Erie City return tubular boilers, total 450 H. P., 2 gen. units, 250 volts D. C.
Last fiscal year output 162,963 tons.
Sales agency, Anchor Coal Co., Cleveland, O.

ANTLER COAL CO.
General Office, Fairmont, W. Va.
PR—T. W. Arnett....Fairmont, W.Va.
GM—T. W. Arnett, " "
PA—T. W. Arnett, " "
TR—B. H. McGinley, " "
GS—U. N. Arnett, " "
CE—West Virginia Eng. Co.," "
SCO—Antler Coal Companies Stores.
Sales Agent, T. W. Arnett, Fairmont, W.Va.

Grant Mine; Drift, Pgh. Seam, 84 to 108 in. thick.
PO—Uffington, W. Va.; SP—Round Bottom, W. Va.; CTY—Mongalia; RR—B. & O.
MS—Bob Pollock.....Uffington, W. Va.
SM—E. H. Skidmore, " "
S of H—Mules.
S of M—Hand.
EMP—28. Last fiscal year output 36,000 tons.

Katherine No. 2 and Thompson Mine, Drift, Pgh. Seams, 84 to 108 in. thick.
PO—Lumberport, W. Va.; SP—Same; CTY—Harrison; RR—B. & O.
MS—J. E. Hamilton, Lumberport, W. Va.
S of H—Mules.
S of M—Hand and 1 elec. mach.
EMP—40. Last fiscal year output 48,000 tons.

Thompson Mine; Drift; Pgh. Seam, 84 to 108 in. thick.
PO—Lumberport, W. Va., SP—Same; CTY—Harrison; RR—B. & O.
MS—J. E. Hamilton, Lumberport, W. Va.
SM—Z. E. Zeek, " "
S of H—Mules.
S of M—Hand and 1 elec. mach.
PP—Buy power.
EMP—25. Last fiscal year output 30,000 tons.

ARCOLA COAL CO.
Arcola Mine; Drift; Sewell and New River Seams; 30 to 36 in. thick.
PO—Arcola, W. Va.; SP—Same; CTY—Webster; RR—B. & O., Richwood branch.
PR—Chas. E. Pool...Clarksburg, W. Va.
TR—Chas. E. Pool, " "
GM—Chas. E. Pool, " "
GS—Chas. E. Pool, " "
PA—Chas. E. Pool, " "
MS—Chas. E. Pool, " "
EM—Horner Bros., " "
S of H—Mules.
EMP—9. New mine.

ARACOMA COAL CO.
Aracoma Nos. 1 and 2 mines, Drifts, Island Creek Seam, 5 ft. 8 in. to 6 ft. 5 in. thick.
PO—Logan, W. Va. SP—Same. CTY Logan. RR—C. & O.
PR—A. J. King ...Huntington, W. Va.
TR—C. M. Galway, ...Pocahontas, Va.
GM—A. J. King,....Charleston, W. Va.
PA—A. J. King " "
EM—E. R. Reik.......Logan, W. Va.
MM—G. D. Woolcock, " "
MS—F. E. King, Logan, W. Va.
SM—I. B. Early........Logan, W.Va.
S of H—7 Elec. loco.; track gauge 44 in.
S of M—6 Elec. mach.
PP—2 Return tubular boilers, total 400 H.P. 3 Gen. units, 2300 volts A.C. 3-phase 60-cycle, and 250 volts D.C.
EMP—200. Last fiscal year output 200,000 tons. Sales agents, Halmar Coal Mining Co., Cincinnati, O.

ARGYLE COAL CO.
General Office, Huntington, W. Va.
Argyle Mine; Drift, Winifrede—Thacker Seam, 68 to 84 in. thick.
PO—Yolyn, W. Va.; SP—Same; CTY—Logan; RR—C. & O.
PR—George M. Jones..Huntington, W.Va.
TR—T. H. Hooper, " "
GM—J. N. Schweitzer, Amherstdale, W.Va.
PA—J. N. Schweitzer " "
CE—W. C. McCall,....Logan, W. Va.
MS—W. T. Harvey......Yolyn, W.Va.
MM—I. L. Ward, " "
EE—I. L. Ward, " "
SM—C. W. Hardy..Amherstdale, W. Va.
S of H—1 storage battery, 1 elec. loco. and mules. Track gauge 44 in.
S of M—2 Elec. mach.
PP—Power purchased.
EMP—75.
Sales Agency, John T. Hesser Coal Co., Cincinnati, O.

ARLINGTON COAL & COKE CO.
Drift Mine, Poca No. 3 Seam.
PO—McDowell, W. Va. SP—North Fork, W. Va. CTY—McDowell. RR—N. & W.
GM—Morriss Watts..McDowell, W.Va.
PA—Morriss Watts, " "
MS—W. M. Norriss, " "
SM—C. D. Broyles, " "
S of H—Elec. loco.
S of M—Hand.
PP—1 gen. unit, 250 volts D. C., 3 boilers.
EMP—175.
Coke ovens—159.

ATLANTIC COAL & COKE CO.
General Office, 731 Land Title Bldg., Philadelphia, Pa.
Atlantic Mine, Drift, Freeport Seam.
PO—Tunnelton, W. Va. SP—Same. CTY—Preston. RR—W. Va., No. R. R.
GM—C. E. Sharpless....Cresson, Pa.
PA—J. E. Wilkinson. Philadelphia, Pa.
EM—F. M. McDaniels. Clarksb'g, W.Va
S of H—Mules and elec. loco.
S of M—Hand.
PP—Gen. units, 500 volts D. C., 4 boilers, 600 H. P.
Note—Idle at present.
(Old information.)

ASHLAND COAL & COKE CO.
Ashland and Graeber Mines; Drift; Pocahontas No. 3 Seam, 4½ to 5½ ft. thick. Washery.
PO—Ashland, W. Va. SP—Crumpler, W. Va. CTY—McDowell, RR—N. & W., Northfork Branch.
PR—W. J. Richards, Pottsville Pa.
TR—G. C. Graeber, Shamokin, Pa.
GM—W. A. Phillips, Ashland, W. Va.
PA—T. J. O'Neil, Ashland, W. Va.
MS—T. J. O'Neil, " " "
EM—C. A. Brown, " " "
EE—C. F. Dwyer, " " "
SM—W. W. Greer, " " "
S of H—4 Elec. loco. Track gauge 48 in.
S of M—Hand, 4 Elec. and 6 Comp. air mach.
PP—8 Water tube and 1 return tubular boilers. B&W., total 1,100 H. P., 4 gen units, 500 volts D.C. 1 compressor.
EMP—350. Last fiscal year output, 225,000 tons. Coke ovens 410. Bee Hive. Sales agency, Castner, Curran & Bullitt, Philadelphia, Pa.

AUSTEN COAL & COKE CO.
Austen Nos. 1 and 2 Drifts; Up. Freeport Seam, 50 to 54 in. thick.
PO—Austen, W. Va. SP—Same. CTY—Preston. RR — B. & O., Raccoon Valley Branch.
PR—C. H. Zehnder, 90 West St., New York, N. Y.
TR—W. J. Wilson, 40 Wall St., New York. N. Y.
PA—F. W. Horchler, Austen W. Va.
MS—F. W. Horchler, " " "
MF—F. H. Jones and J. F. Cook, Austen, W. Va.
CE—J. R. Monroe......Austen, W. Va.
MM—C. S. Wiles,Austen, W. Va.
EE—C. S. Wiles, Austen, W. Va.
SCO—Address the Company. Buyer, G. M. Frazier, Austen, W. Va.
S of H—5 Elec. loco. and mules. Track gauge 36 in.
S of M—6 Elec. mach. and hand.
PP—3 Return tubular Union I. Wks. boilers, total 450 H.P., 2 gen units, 550 volts D. C., 1 pump.
EMP—350. Coke ovens, 228 Bee Hive.

AVON COAL CO.
See Deegans Eagle Coal Co.

BABCOCK COAL CO.
General Office, Frick Bldg., Pittsburgh, Pa.
PR—E. V. Babcock, Pittsburgh, Pa.
TR—F. R. Babcock, "
GM—R. M. Smith, Landisburg, W. Va.
PA—R. M. Smith, Landisburg, W. Va.
CE—W. H. Cunningham, Huntington, W. Va.
EM—O. P. Amick, Cliff Top, W. Va.
EE—G. V. Behan, Sewell, W. Va.
SCO—Davis Supply Co., buyer, Mr. Huff, Pittsburgh, Pa. Sales agency, C. & O. Coal Agency Co., Richmond, Va.

Cliff Top No. 3 Mine, Drift, Sewell seam, 2 ft. 1 in. to 2 ft. 10 in. to 4 ft. thick.
PO—Cliff Top, W. Va. SP—Sewell, W Va. CTY—Fayette. RR—C. & O., B. C. & C. Ry. Co. branch.
MS—W. L. Herndon, Cliff Top, W. Va.
SM—H. N. Harison, Sewell W. Va.
S of H—1 Elec. loco. and mules. Track gauge 42 in.
S of M—6 Elec. mach.
PP—Boiler, 120 H. P. gen unit 250 volts D. C., 2 compressors and 2 pumps.
EMP—75. Coke Ovens, 193 Bee Hive. Last fiscal year output, 40,500 tons.
Cliff Top No. 4, Drift, Sewell Seam, 3 ft. 2 in to 4 ft. thick.
PO—Cliff Top, W. Va. SP—Sewell, W. W. Va. CTY—Fayette. RR — C.&O., B.C.&C.RY.Co.
MS—W. L. Herndon, Cliff Top, W. Va.
SM—G. T. Myles, Cliff Top, W. Va.
S of H—Mules. Track gauge, 42 in.
S of M—Hand.
EMP—100. Last fiscal year output, 42,400 tons.
(Old information.)

BAILEY-WOOD COAL CO.
General Office, Glen Jean, W. Va.
Bailey Wood mine, Drift, Beckley Seam, 4½ to 6 ft. thick.
PO—MacAlpin. SP — Woodbay CTY —Raleigh. RR—Virginian, Winding Gulf Branch.
PR—C. B. Lee,.. Glen Jean, W. Va.
TR—Thos. Nichol, " "
GM—Thos. Nichol, " "
PA—Thos. Nichol, " "
GS—J. C. Baker, MacAlpin, W. Va.
CE—T. W. Sprague, Boston, Mass.
EM—E. C. Minter.....MacAlpin, W.Va.
S of H—6 Elec. loco.; track gauge 44 in.
S of M—Hand and 1 Elec. mach.
PP—3 Stanwood, Houston & Gamble Return tubular boilers, total 600 H.P. 2 gen. units 250 volts D. C., 1 pump.
EMP—100. Last fiscal year output 95,000 tons. Sales agent, C. G. Blake Co., Cincinnati, O.

BALKAN COAL COMPANY
General Office, 1000 Franklin Bldg., Philadelphia, Pa.
Balkan Mine; Drift; Pittsburgh Seam; 90 to 96 in. thick.
PO—Dola, W. Va.; SP—Same; CTY—Harrison; RR—B. & O.
PR—David E. Williams, Jr., Philadelphia, Pa.
TR—William A. Smith, " "
GM—A. M. Riddell......Altoona, Pa.
GS—A. M. Riddell, " "
PA—A. Y. Stevenson, Philadelphia, Pa.
MS—James Bowers......Dola, W. Va.
CE—Horner Brothers, Clarksburg, W. Va.
EM—Horner Brothers, " "
S of H—Mules and 1 gasoline loco.
S of M—6 compressed air machines.
PP—Return tubular boiler, total 500 H. P. 1 air compressor.
Daily output 500 tons.

BALLINGER COAL CO.
Ballinger Nos. 1 and 2 Mines, Drifts, Sewell Seam.
PO—Nuttallburg, W. Va. SP—Ballinger, W. Va. CTY—Fayette. RR—C. & O.
GM—Geo. Holland....Winona, W. Va.
PA—W. H. Holland, Jr., Winona, W. Va.
EM—Geo. Holland ....Winona, W.Va.
MS—John Ohlinger..Nuttallburg, W.Va
SM—Sol. Holland.....Winona, W.Va
S of H—Elec. loco. and mules
S of M—Hand.
EMP—135
(Old information.)

BARKERS CREEK COAL CO.
Drift; Pocahontas No. 3 Seam; 54 to 60 ins. thick.
PO—Tralee, W. Va.; SP—Same; CTY—Wyoming; RR—Virginian.
PR—J. E. Toliver....Beckley, W. Va.
TR—J. C. Sullivan ....Tralee, W. Va.
GM—J. C. Sullivan " "
MS—Jas. Halstead " "
PA—J. C. Sullivan " "
CE—Philip Konrad, Kanawha Falls, W. Va.
EM—Philip Konrad Kanawha Falls, W. Va.
Note -Successors to Cooper-Pocahontas Coal Co.

BECKLEY SMOKELESS COAL COMPANY
Drift Mine; Beckley & Pocahontas No. 3 Seam; 54 in. thick.
PO—Besco; SP—Same; CTY—Raleigh; RR—Virginian & C. & O.
PR—F. M. Cook..Winding Gulf, W. Va.
TR—E. C. Minter......Besco, W. Va.
GM—E. C. Minter " "
GS—E. C. Minter " "
PA—E. C. Minter " "
EM—E. C. Minter " "
S of H—Mules and Gravity. Track gauge 48 in.
S of M—Hand.
EMP—25. Just developing mine.

BEECH COAL CO.
Drift Mine; No. 2 Gas Seam, 44 to 60 in. thick.
PO—Sharples, W. Va.; SP—Same; CTY —Logan; RR—C. & O.
PR—Julian Hill, ...Madison, W.Va.
PA—Julian Hill, " "
TR—O. C. Chambers.
GS—Dell Hill, ...Sharples, W.Va.
CE—Dell Hill, " "
SM—I. L. Stewart, " "
S of H—2 elec. loco. Track gauge 44 in.
S of M—2 elec. mach.
PP—Power purchased.
Sales Agency, W. N. Griffith, Blufton, O.

BEECH GROVE COAL CO.
Beech Grove Mine; Slope; Pittsburgh No. 8 Seam; 60 to 66 in. thick.
PO—Mason, W. Va.; SP—Mason City, W. Va.; CTY—Mason; RR—B. & O.
PR—J. F. Icenhower....Mason, W. Va.
TR—J. F. Icenhower, " "
PA—J. F. Icenhower, " "
MS—L. Estep, " "
S of H—Mules.
S of M—Hand.
PP—1 water tube boiler, 1 pump.
Note—Output disposed of locally.

BEECHWOOD COAL & COKE CO.
Mines Nos. 1 and 2, Drifts, Fire Creek Seam, 4 to 5 ft. thick.
PO—Claremont, W. Va. SP—Same. CTY—Fayette. RR—C.&O.
PR—C. C. Beury, Claremont, W. Va.
TR—C. C. Beury, " " "
GM—C. C. Beury, " " "
GS—E. L. Hawley, " " "
PA—E. L. Hawley, " " "
CE—S. H. Bridge, Quinnimont, W. Va.
EM—S. H. Bridge, Quinnimont, W. Va.
SCO—Beechwood Coal & Coke Co., buyer, E. L. Hawley.
S of H—Rope, mules and 1 gasoline motor.
S of M—Hand.
PP—6 boilers, total 500 H. P.
EMP—150. Last fiscal year output, 85,000 tons.
Sales Agency, New River Coal Co.

BELL COAL MINE CO. OF CINCINNATI.
See Vaughan Construction Co.

BEN FRANKLIN COAL CO. OF W. VA.
General Office, Moundsville, W. Va.
1 Mine in West Virginia, 2 Mines in Penna.
Panama Mine; Shaft, Pgh. Seam, 67 in. thick.
PO—Moundsville, W. Va.; SP—Same; CTY—Marshall RR—B. & O.
PR—M. J. McQuade..Moundsville, W.Va.
TR—M. A. McQuade, Moundsville, W. Va.
PA—M. J. McQuade, Moundsville, W.Va.
MS—John Stevens, Moundsville, W. Va.
GM—M. J. McQuade, " "
EE—C. M. Bennett, " "
S of H—3 Elec. loco. and 2 storage batteries; track gauge 44 in.
S of M—5 Elec. mach.
PP—3 Return tubular boilers, total 450 H. P., 2 gen. units 250 volts D. C., 1 pump.
EMP—135. Last fiscal year output 119,000 tons.

BENGAL COAL CO.
General Office, Huntington, W. Va.
Bengal Mine; Drift, Eagle Seam, 60 to 84 in. thick.
PO—Kistler, W. Va.; SP—Same (Prepay to Accoville, W. Va.) RR—C. & O., Guyan Div.
PR—T. F. Bailey....Huntington, W.Va.
TR—W. H. Cunningham, " "
GM—Frank A. Kearns...Kistler, W. Va.
PA—A. E. Morgan, " "
MS—A. E. Morgan, " "
S of H—1 Elec. loco. and mules; track gauge 44 in.
S of M—3 Elec. mach.
PP—2 Phoenix return tubular boilers, total 300 H. P., gen. unit 275 volts D. C.
EMP—25. Last fiscal year output tons.

BEURY BROS. COAL & COKE CO.
Echo Mine Shaft, Fire Creek and Sewell Seams 42 to 60 in. thick.
PO—Beury, W. Va.; SP—Same; CTY—Fayette; RR—C. & O.
PR—T. C. Beury....Charleston, W.Va.
TR—H. B. Beury........Beury, W.Va.
GM—H. B. Beury, " "
PA—M. L. Richmond, " "
SM—M. L. Richmond, " "
EM—P. Konrad..Kanawha Falls, W.Va.
S of H—Steam loco. and gravity; track gauge 44 in.

S of M—Hand.
PP—1 pump.
EMP—90. 50 bee hive coke ovens. Last fiscal year output 59,250 tons.
Sales Agency, New River Co.

BIG BEND COAL CO.
Big Bend Mine, Drift.
PO—Dimmock, W. Va. CTY—Fayette.
PR—B. B. Buster...Dimmock, W.Va.
TR—Ernest Echols, " "
PA—Ernest Echols, " "
GM—J. H. Dempsey, " "
S of H—Mules and rope.
S of M—Hand.

BIG EAGLE MINING CO.
Now Monto Coal Co.

BIG VEIN COAL CO.
General Office, Baltimore, Md.
Shaw Mine; Drift; Bakerstown Seam; 42 in. thick.
PO—Shaw, W. Va.; SP—Big Vein Siding, W. Va.; CTY—Mineral; RR—Western Maryland.
PR—Frank J. Taylor....Baltimore, Md.
GM—Frank J. Taylor, " "
TR—John C. Wolf, " "
MS—S. S. Harvey........Shaw, W. Va.
PA—S. S. Harvey, " "
S of H—Mules.
S of M—Hand.
PP—Boiler, 150 H. P.
EMP—60. Last fical year output 22,000 tons.

BLACK BAND FUEL CO.
General Office, No. 1 Broadway, New York, N. Y.
Black Band Nos. 1 and 2 Mines; Drift, Black Band Seam, 38 to 52 in. hick.
PO—Olcott, W. Va.; SP—Brownland, W. Va.; CTY—Kanawha; RR—C. & O., Kanawha Central Br.
PR—Charles S. Thorne.
TR—Clarence Fuhrer.
GS—H. S. Lingle........Olcott, W.Va.
PA—H. S. Lingle, " "
CE—Romine & Snider, " "
SCO—Address the Company.
S of H—6 Elec. loco.; track gauge 42 in.
S of M—6 Elec. mach.
PP—4 Return tubular boilers, total 600 H. P.
EMP—300. Last fiscal year output 120,000 tons.

BLACK BETSEY COAL MINING CO.
Black Betsy Mine, Nos. 1 and 2, drift; Pgh. Seam, 5 ft. thick.
PO—Black Betsy, W. Va. SP—Same. CTY—Putnam. RR—Kanawha & Michigan.
PR—E. T. O'Connor.
TR—Alfred S. Clarke.
GM—T. Woodward, Black Betsy, W. Va.
PA—T. Woodward, Black Betsey, W. Va.
GS—T. Woodward, Black Betsey, W. Va.
MS—Chas. R. Suntrock, Black Betsey, W. Va.
CE—John C. Child, Black Betsey, W. Va.
MM—Arthur Bownlow, Black Betsey, W. Va.
EE—Frank Davidson, Black Betsey, W. Va.
SM—Everett Scholz, black Betsey, W. Va.
S of H—4 Elec. loco. Track gauge 36 in.
S of M—Hand.
PP—2 Boilers, total 300 H. P. gen. units 2200 volts, A. C. 200 volts, D. C.
EMP—450. Last fiscal year output, 250,000 tons.

BLACK HAWK COLLIERY COMPANY.
Black Hawk Mine, Drift No. 2 Gas Seam; 4½ to 5 ft. thick.
PO—Big Creek, W. Va. SP—Same. CTY—Logan. RR—C. & O., Guyan Valley Branch.
PR—Norman Maddocks, Detroit Mich.
TR—A. W. Bosley, " "
GM—A. W. Bosley, " "
MS—D. A. Barton, " "
PA—D. A. Barton, " "
EM—Beddow & McCorkle, Logan, W. Va.
S of H — Mules. Track gauge 48 in.
EMP—25. Last fiscal year output 10,000 tons.

BLACK WOLF COAL & COKE CO.
Black Wolf Mine; Drift; Nos. 3 and 4 Pocahontas Seam, 40 to 54 in. thick.
PO—Dearing, W. Va. SP—Black Wolf, W. Va. CTY—McDowell. RR—N. & W.
PR—Jas. R. Gilliam....Lynchburg, Va.
TR—Thos. D. Christian, " "
GM—M. Watts......Eckman, W. Va.
GS—J. M. Meredith....Dearing, W. Va.
PA—L. H. Barberry, " "
EM—C. J. Bartills.....Gilliam, W. Va.
MM—L. W. Vickers....Dearing, W. Va.
EE—W. J. Murray, " "
S of H—4 elec. locos. Track gauge 44 in.
S of M—Elec. mach.
PP—2 boilers, 400 H. P., 1 gen. unit, 500 volts D. C.
EMP—225

BLACKSBURG COAL CO.
General Office, Stock Exchange Bldg., Philadelphia, Pa
Drift Mine; No. 2 Gas; No. 5 Block and Eagle Seam.
PO—Palmer, W. Va.; CTY—Braxton.
GM—L. O. Knipp, Philadelphia, Pa.

BLAINE MINING CO.
General Office No. 1 Broadway, New York, N. Y.
Potomac Manor Nos. 1 and 2 mines, Drift; Davis No. 6 Seam, 5½ ft. thick.
PO—Potomac Manor, W. Va.; SP—Same. CTY—Mineral. RR — W. M.
—**PR** T. B. Davis......New York, N. Y.
TR—Abel Mishler, " " " " "
GM—Jas. G. Boyd, Potomac Manor, W. Va.
PA—Jas. G. Boyd, Potomac Manor, W. Va.
MS—Jas. G. Boyd, Potomac Manor W. Va.
EM—George Boyd, Potomac Manor, W. Va.
MM—Lafe O'Haver, Potomac Manor, W.Va.
SM—W.N.Buzzerd, Potomac Manor, W.Va.
S of H—4 Elec. loco.; track gauge 36 in.
S of M—Hand.
PP—2 Return tubular boilers, total 300 H. P. 1 Gen. unit 500 volts, D. C. Sales agent, A. Mishler, New York, N. Y.

BLUE CREEK COAL & LAND CO.
General Office, Charleston, W. Va.
Blue Creek Nos. 1, 2, 3, 4 and 5 mines. Drift; Incline, 4½ to 6 ft. thick.
PO—Blakely, W. Va.. SP—Same. CTY—Kanawha. RR—K. & W. V.
PR—E. S. Jones, Scranton, Pa.
TR—T. E. Jones, Scranton, Pa.
GM—R. H. England, Charleston, W. Va.
PA—R. H. England....Charleston, W.Va.
CE—G. S. Plumley, " "
MS—J. E. Griffiths...Blakely, W. Va.
MM—Irwin Hill, Blakely, W. Va.
SCO—Forest Store Co. Buyer, W. L. Carr, Blakely, W. Va.
S of H—Mules and 4 electric locomotives. Track gauge 42 in.
S of M—Hand and 9 Electric machines.
PP—2 Return Tubular boilers, total, 300 H. P., 1 generating unit, 250 volts D. C., 1 pump.
EMP—300. Last fiscal year output 200,000 tons. Sales agent, R. H. England, Charleston, W. Va

BLUE JAY LUMBER CO.

General Office, Blue Jay, W. Va.
Blue Jay No. 4 Drift, Beckley Seam, 4 to 5 ft. thick.
PO—Glen Morgan, W. Va. **SP**—McQuade, W. Va. **CTY**—Raleigh. **RR**—C. & O., Piney Branch.
PR—C. L. Goodwin, Greensburg, Pa.
TR—P. C. Lynch, Blue Jay, W. Va.
CM—P. C. Lynch, Blue Jay, W. Va.
MS—Pat. McQuade, Glen Morgan, W. Va.
SM—J. A. Okes ....Blue Jay, W. Va.
S of H—Mules. Track gauge, 42 in.
S of M—Hand. Last fiscal year output, 8,638 tons. Sales Agents, W. Va. Coal Co., Richmond, Va.

BLUE RIDGE COAL CO.

General Office, 801 Union Bank Bldg., Pittsburgh, Pa.
Shaft Mine; Pittsburgh Seam; 78 to 120 in. thick.
PO—Gassaway, W. Va.; **SP**—Same; **CTY**—Braxton; **RR**—Coal & Coke.
PR—Chas. E. Hays....Greensburg, Pa.
PA—Chas. E. Hayes, " "
TR—Geo. S. Sarver, " "
SEC—E. E. Shaulis.....Pittsburgh, Pa.

BLUME COAL & COKE CO.

Blume Mine, Drift. Sewell Seam, 3 to 4 ft. thick.
PO—Lookout, W. Va. **SP**—Same. **CTY**—Fayette. **RR**—C. & O., Keeney's Creek Branch.
PR—D. W. Boone.......Lookout, W.Va.
CM—D. W. Boone, " " "
PA—D. W. Boone, " " "
MS—S. J. Bays, " "
EE—A. H. Suttle " " "
SM—G. D. Walker, " " "
EM—Clark & Krebs..Charleston, W. Va.
S of H—2 Elec. loco. Track gauge, 42 in.
S of M—6 Elec. mach.
PP—Boilers, 200 H.P., 500 volts D.C.
EMP—125. Last fiscal year output 75,000 tons.
Sales Agency, C. & O. Coal Agency Co.

BOAL, E. C.

E. C. Boal Mine; Drift; 44 to 48 in. thick.
PO—Logan, W. Va.; **SP**—Same; **CTY**—Logan; **RR**—C. & O., G. V. branch.
PR—E. C. Boal........Logan, W. Va.
TR—E. C. Boal, " "
GS—E. C. Boal, " "
PA—E. C. Boal, " "
EM Beddow & McCorkle.
S of H—Mules. Track gauge 44 in.
S of M—1 elec. mach.
EMP—5. Last fiscal year output, 2000 tons.

BOAT RUN COAL CO.

General Office, Grafton, W. Va.
Boat Run Mine; Drift; Seam 66 in. thick.
PO—Arden, W. Va.; **SP**—Same; **CTY**—Barbour; **RR**—B. & O.
PR—L. B. Brydon......Grafton, W.Va.
TR—Richard Gerstell, " "
GM—Richard Gerstell, " "
GS—Ira Hoffman........Arden, W.Va.
PA—Gail Goodwin......Grafton, W.Va.
S of H—1 Elec. loco.
PP—2 Water Tube Boilers, 1 gen. unit; 1 Air Comp.
EMP—50. Last fiscal year output 60,043 tons.

BOOMER COAL & COKE CO.

General Office, Cleveland, Ohio.
North Nos. 1 and 2 South Nos. 2, 3, 4, 5 and 6 Mines, Drift; "Eagle & Gas" Seam; 5½ ft. thick.
PO—Boomer, W. Va.; **SP**—Same; **CTY**—Fayette. **RR**—Kanawha & Mich.
PR—H. M. Hanna, Jr.,...Cleveland, O.
TR—C. H. Hanna, " "
CM—Michael Gallagher, " "
PA—T. F. Cadden, "
GS—T. H. Huddy......Boomer W.Va.
SCO—Boomer Supply Co., Buyer, Jesse Craver, Boomer, W.Va.
S of H—Mules and 9 Elec. loco., track gauge 42 in.
S of M—27 elec. mach.
PP—6 Boilers, total 800 H. P.
EMP—1200. Last fiscal year output 950,000 tons.
Sales Agent, M. A. Hanna & Co., Cleveland, O.

BOONE COUNTY COAL CORPORATION

General Office Clothier, W. Va.
No. 1 Mine Drift; Chilton Seam; 45 to 60 in. thick.
PO—Clothier, W. Va.; **SP**—Same; **CTY**—Logan; **RR**—C. & O., Coal River branch.
PR—Wm. J. Clothier..Philadelphia, Pa.
TR—J. Keating Wilcox, " "
GM—A. R. Montgomery, Jr., Clothier, W. Va.
PA—A. R. Montgomery, Jr., Clothier, W. Va.
MS—A. R. Montgomery, Jr., Clothier, W. Va.
CE—Philip Konrad, Kanawha Falls, W. Va.
EM—Ewing & Nelson...Clothier, W. Va.
EE—Walter Edwards, " "
SCO—Proctor & Woodrum, " "
S of H—Mules and 2 storage battery locos. Track gauge 48 in.
S of M—2 elec. mach.
PP—Purchase power.
New mine.

BOOTH-BOWEN COAL & COKE CO.

Booth-Bowen Mine; Drift, Poca. Smokeless No. 3 Seam; 60 to 96 in. thick.
PO—Freeman, W. Va.; **SP**—Coon, W. Va.; **CTY**—Mercer; **RR**—N. & W., Simmons Br.
PR—Harry Rowen......Freeman, W.Va.
TR—Harry Bowen, " "
GM—Harry Bowen, " "
GS—J. H. Bowen, " "
MM—Wm. Vincent, " "
EE—J. H. Bowen, " "
PA—J. A. Morgan, " "
EM—D. C. Jones, " "
SCO—Booth-Bowen Store. Buyer, J. A. Morgan, Freeman, W. Va.
S of H—2 Elec. loco. and mules.
S of M—2 Elec. mach.
PP—Power purchased.
EMP—250. Coke ovens, 100 Bee Hive Last fiscal year output 199,748 tons.

BORGMAN COAL CO.

Borgman Mine, Drift, Freeport Seam.
PO—Tunnelton, W. Va. **SP**—Borgman, W. Va. **CTY**—Preston. **RR**—W. V. N.
GM—F. W. Borgman.Tunnelton, W.Va
PA—F. W. Borgman, " "
MS—F. W. Borgman, " "
SM—Borgman Supply Co. Buyer, Geo. Rhodes, Tunnelton, W. Va.
S of H—Mules and rope. Track gauge 36 in.
S of M—Hand.
PP—Boiler, 80 H. P.
EMP—50. Last fiscal year output 60,000 tons.

BOTTOM CREEK COAL & COKE CO.

Bottom Creek No. 1 and No. 2, Drifts, Pocahontas No. 3 Seam, 62 to 72 in. thick.
PO—Vivian, W. Va. **SP**—East Vivian, W. Va. **CTY**—McDowell. **RR**—N. & W.
PR—W. H. Lewis, ... Pottsville, Pa.
TR—G. S. Patterson, Vivian, W. Va.
GM—S. W. Patterson, " " "
GS—G. S. Patterson, " " "
PA—G. S. Patterson, " " "
MS—John Maurice " " "
EM—John F. Maurice, " "
MM—W. E. Daniel, " " "
EE—W. T. Jones, " " "
SM—Harry McFadden, " "
S of H—Mules and 5 elec. loco. Track gauge 44 inches.
S of M—Hand and 7 elec. machines.
PP—3 Erie return tubular boilers, total 450 H. P. 2 Gen. units, 250 volts D. C.
EMP—350. Last fiscal year output, 173,787 tons. Coke ovens, 220 Bee Hive. Sales Agents, Castner, Curran & Bullitt, Philadelphia, Pa.

BOWER COAL CO.

Drift Mine, Sewell Seam, 48 to 50 in. thick.
PO—Mabscott, W. Va.; **SP**—Same; **CTY**—Raleigh; **RR**—C. & O.
PR—John Bower......Mabscott, W.Va.
TR—M. S. Bower, " "
GM—M. S. Bower, " "
CE—P. C. Thomas, " "
MS—H. S. Walker, " "
S of H—Mules; track gauge 42 in.
S of M—Hand.
PP—1 Pump.
EMP—8. Last fiscal year output 4,000 tons.

BRADY, A. SPATES

General Office, Piedmont, W. Va.
Brady Mine; Drift; Kittanning Seam; 84 to 108 in. thick.
PO—Mabie, W. Va.; **SP**—Same; **CTY**—Randolph; **RR**—Coal & Coke, Brady Siding.
GM—A. Spates Brady, Piedmont, W. Va.
GS—A. Spates Brady, " "
PA—A. Spates Brady, " "
MF—J. G. Witt........Mabie, W. Va.
MM—F. M. Offutt, " "
SCO Brady Store. Buyer F. M. Offutt, Mabie, W. Va.
S of H—1 gasoline loco.
S of M—Hand.
PP—2 pumps.
Last fiscal year output 35,000 tons.
Successors to Brady Coal Co.

CRANCH COAL & COKE CO.

Elverton Mine, Drift, Sewell Seam.
PO—Elverton, W. Va. **SP**—Same. **CTY**—Fayette. **RR**—C. & O.
GM—W. R. J. Zimmerman, Elverton, W. Va.
PA—W. R. J. Zimmerman, Elverton, W. Va.
EM—S. H. Bridge.Quinnimont, W.Va.
MS—W. D. Crickmer..Elverton, W.Va.
SM—W. B. Payne, " "
S of H—Elec. loco.
S of M—Hand and elec. mach.
PP—3 boilers, 450 H. P., gen. units, 250 volts D. C.
EMP—75.
Coke ovens—50.
(Old information.)

BRANCHLAND COAL CO

PR—Jas. R. Branch, Branchfield, W. Va.
TR—E. F. Hubball, Branchfield, W. Va.
GM—Jas. R. Branch, Branchfield, W. Va.
PA—Jas. R. Branch, Branchfield, W. Va.
SM—Cannon Fleming, Branchfield, W. Va.

Branchfield Mine, Drift, Stockton Belmont Seam, 7 to 8 ft. thick.
PO—Branchfield, W. Va. **SP**—Banchland, W. Va. **CTY**—Lincoln. **RR**—C. & O.
S of H—Mules. Track gauge 44 in.
S of M—8 Compressed air machines.
PP—1 boiler, 150 H. P. 1 Gen. unit. 1 air compressor.
EMP—75. Last fiscal year output 50,000 tons.

Guyan River Mine, Drift, No. 5 Block Seam, 4 ft. thick.
PO—Branchfield, W. Va. **SP**—Branchland, W. Va. **CTY**—Lincoln. **RR**—C. & O.
S of H—Mules. Track gauge 44 in.
S of M—2 compressed air machines.
PP—Power furnished by Branchland Coal Co.
EMP—30. Last fiscal year output, 30,000 tons.
(Old information.)

BRAXTON COAL CO.

Braxton Mine; Drift; Pittsburgh Seam; 60 to 120 in. thick.
PO—Braxton, W. Va.; **SP**—Cutlip, W. Va.; **CTY**—Braxton; **RR**—Coal & Coke.
PR—J. S. Klinefelter...Braxton, W. Va.
TR—J. S. Klinefelter, " "
GS—J. S. Klinefelter, " "
PA—J. S. Klinefelter, " "
SM—Mr. Brown, " "
CE—J. G. Alstetter..Clarksburg, W. Va.
SCO—Brown & Wood...Braxton, W. Va.
S of H—Mules.
S of M—3 compressed air mach.
PP—1 return tubular boiler, total 100 H. P., 1 air compressor.
EMP—35.

BRIER CREEK COAL COMPANY.

Knickerbocker & Reynold Mines; Drift; 48 to 54 in. thick.
PO—Olcott, W. Va; **SP**—Same; **CTY**—Kanawha; **RR**—C. & O., Coal River Branch.
PR—J. R. Thomas, Charleston, W. Va.
TR—W. J. Magee, Cincinnati, O.
GM—W. M. Gillir......Olcott, W. Va
GS—W. M. Olcott, " "
PA—W. M. Olcott, " "
SCO—Brier Creek Coal Co.
S of H—elec, loco.

BROWN COAL CO.

Brown Mine; Drift; Sewell Seam, 42 to 56 in. thick.
PO—Nuttallburg, W. Va. **SP**—South Nuttall, W. Va. **CTY**—Fayette. **RR**—C. & O.
GM—J. A. Boone.Nuttallburg, W.Va.
PA—J. A. Boone, " "
SM—Eli J. Taylor, " "
MS—John Fraser..Nuttallburg. W.Va.
EM—P. Konrad.Kanawha Falls,W.Va.
S of H—Mules and 2 Elec. loco.; track gauge 44 in.
S of M—Hand and 5 elec. mach.
PP—2 boilers, total 300 H. P., gen. units, 550 volts D. C.
EMP—150. Last fiscal year output 100,000 tons.

BRYDON, L. B. & CO.

PO—Grafton, W. Va
Successors to Sunnyside Coal Co.
No report.

BUCHANAN COAL CO.

Slope Mine. War Creek Seam. 40 to 64 in. thick.
PO—Yukon, W. Va.; **SP**—Lomax, N. Va. **CTY**—McDowell. **RR**—N. & W., Dry Fork Branch.
PR—J. L. Charles.......Yukon, W.Va.
GM—J. L. Charles....Yukon, W.Va.
PA—J. L. Charles, " "
MS—M. A. Hurley, " "
EM—G. J. Cooper......Welch, W. Va.
EE—E. B. Tucker......Yukon, W. Va.
S of H—Mules and 1 gasoline loco.
S of M—Hand and 1 elec. mach.
PP—1 boiler, 150 H. P., 2 pumps. Power purchased.

BUCKHANNON RIVER COAL & COKE CO.

Florence No. 2 Mine; Drift; Masontown or Upper Freeport Seam, 70 in. thick.
PO—Adrian, W. Va. **SP**—Same. **CTY**—Upshur. **RR**—C. & C.
PR—T. S. Lackey......Uniontown, Pa.
TR—M. D. Brooks, " "
GM—H. D. Howarth....Adrian, W. Va.
GS—H. D. Howarth, " "
PA—H. D. Howarth, " "
MS—W. D. Howard, " "
MM—W. W. Smythe, " "
EE—W. W. Smythe, " "
EM—G. J. Alstetter..Clarksburg, W. Va.
SCO—Adrain Supply Co. Buyer, I. P. Matthews, Adrian, W. Va.
SM—H. O. Talbert, French Creek, W. Va.
S of H—1 elec. loco. Track gauge 42 in.
S of M—2 Elec. machines
PP—2 water tube boilers, total 300 H. P., 1 gen. unit, 250 volts D. C., 1 pump.
EMP—90. Last fiscal year output 75,000 tons. 36 Bee Hive Coke Ovens. Sales agents, National Fuel Co., Uniontown, Pa.

BUCKEYE COAL & COKE CO.

Buckeye Mine; Drift, Poca No. 3 Seam.
PO—Freeman, W. Va.; **SP**—Coon and Orkney, W. Va.; **RR**—N. & W.
PR—W. C. Stephenson....Roanoke, Va.
TR—W. C. Stephenson, " "
GM—J. C. Pack......Freeman, W.Va.
PA—J. C. Pack, " "
EM—D. C. Jones......Bramwell, W.Va.
GS—F. R. Hewitt, " "
MS—H. C. Price, " "
SCO—Address the Company, Freeman, W.Va.
S of H—5 Steam loco. and mules track gauge 44 in.
S of M—Hand.
PP—Buy power.
EMP—200. Last fiscal year output 130,818 tons.
Sales Agency, Castner, Curran & Bullitt, Inc.

BUFFALO COAL CO., INC.

Buffalo Mine, Dift, Winefrede Seam, 4 to 6 ft. thick. Operate washery.
PO—Chattaroy, W. Va. **SP**—Same. **CTY**—Mingo. **RR**—Norfolk & Western Ry.
PR—C. E. Wilson, Crewe, Va.
TR—T. C. Ferger, Chattaroy, W. Va.
GM—S. V. Preston, " " "
MS—D. S. Holmes, " " "
SM—G. W. Linthicum, " " "
EM—N. H. Minnakee, " " "
EE—H. M. Williamson, " " "
S of H—7 elec. loco. Track gauge 48 in.
S of M—3 Compressed air and 5 elec. mach.
PP—3 Return Tub. boilers total H. P. 425. 2 generating units, 250 volts, D. C. 1 air comp, 6 pumps.
EMP—200. Last fiscal year output 140,000 tons.

BUFFALO EAGLE COLLIERY CO.

PR—P. J. Riley......Accoville, W. Va.
GM—P. J. Riley, " "
TR—J. H. Ford, " "
PA—J. H. Ford, " "
CE—G. S. Borden...Charleston, W. Va.
EE—George R. Wood...Philadelphia, Pa.
SM—P. J. Riley......Accoville, W. Va.
SCO—Buffalo Eagle Colliery Co. Buyer, J. H. Ford, Accoville, W. Va.

Becco No. 1 Mine; Drift; Eagle Seam; 72 in. thick.
PO—Accoville, W. Va; **SP**—Becco, W. Va.; **CTY**—Logan, W. Va.; **RR**—C. & O.
S of H—2 elec. locos. Track gauge 44 in.
S of M—2 elec. mach.
PP—3 air compressors.
EMP—60.

Becco No. 2 Mine; Drift; Island Creek Seam; 60 in. thick.
PO—Accoville, W. Va.; **SP**—Becco, W. Va.; **CTY**—Logan; **RR**—C. & O.
S of H—1 elec. loco. Track gauge 44 in.
S of M—1 elec. mach.
EMP—40.

Becco No. 3 Mine; Drift; Chilton Seam; 84 in. thick.
PO—Accoville, W. Va.; **SP**—Becco, W. Va.; **CTY**—Logan; **RR**—C. & O.
S of H—1 elec. loco. Track gauge 44 in.
S of M—1 elec. mach.

BUTTERMORE, J. J., COAL CO.

General Office, Connellsville, Pa.
Elizabeth Mine, Drift, Pittsburgh Seam 7 to 9 ft. thick.
PO—Montana, W. Va.; **SP**—Same; **CTY**—Marion; **RR**—B. & O., F. M. & P. Branch.
PR—J. J. Buttermore, Connellsville, Pa.
GM—J. J. Buttermore, " "
TR—Geo. S. Connell, " "
PA—Geo. S. Connell, " "
MS—G. T. Rodeheaver, Catawba, W. Va.
S of H—Mules; track gauge 42 in.
S of M—Hand.
EMP—20.

BYRON COAL CO.
General Office, Clarksburg, W. Va.
Althea Mine; Drift; Pittsburgh No. 8 Seam, 8 ft. thick.
PO—Mt. Clare, W. Va. SP—Byron, W. Va. SP—Byron, W. Va. CTY — Harrison. RR—B. & O.
PR—H. J. Glick......Cumberland, Md
TR—P. P. Gannor....Westernport, Md.
PA—P. P. Gannor, " "
MS—J. H. Callahan..Mt. Clare, W. Va.
CE—Carl Horner, Clarksburg, W. Va.
EM—Carl Horner, Clarksburg, W. Va.
S of H—Mules, track gauge 42 in.
S of M—2 Elec. Mach.
PP—Power purchased.
EMP—85. Last fiscal year output 72,345 tons. Sales agent, D. Howard, Clarksburg, W. Va.

CABIN CREEK CONSOLIDATED COAL CO.
General Office, Kayford, W. Va. 22 Mines in W. Va.
PR—W. M. Puckett, Charleston, W. Va.
GM—Josiah Keely.....Kayford, W. Va
PA—Josiah Keely, " "
EM—J. S. Jenkins, " "
MM—C. A. Harmon, " "
EE—C. A. Harmon, " "
SCO—Buyer, A. J. Baker, " "

Kayford Nos. 1 and 2, Drifts; No. 1 Gas Coal, 4ft. 11 in. to 7 ft. thick.
PO—Kayford, W. Va. SP—Same. CTY —Kanawha. RR—C. & O. Cabin Creek Branch.
MS—H. L. Fisher. Kayford, W. Va.
SM—C. E. Campbell....Kayford, W. Va.
S of H—Mules and 2 elec. loco. track gauge 44 inches.
S of M—Pick and 3 elec. machines.
PP—Power purchased.
EMP—50. Last fiscal year output 40,245 tons. Idle half time.

Raccoon No. 1, Drift, No. 2 Gas seam, 3 ft 10 in. to 5 ft. 10 in. thick.
PO—Kayford, W. Va. SP—Same. CTY —Kanawha. RR—C. & O. Cabin Creek Branch.
MS—H. L. Fisher ....Kayford, W. Va.
SM—C. E. Campbell....Kayford, W. Va.
S of H—Mules and 1 elec. loco. Track gauge 44 in.
S of M—Pick and 6 elec. machines.
PP—5 pumps. Power purchased.
EMP—130. Last fiscal year output 112,319 tons.

Raccoon No. 2 East and Raccoon No. 2 West, Drifts, Coalburg Seam, 5½ to 7½ ft. thick.
PO—Kayford, W. Va. SP—Same. CTY—Kanawha. RR — C. & O. Cabin Creek Br.
MS—H. L. Fisher ....Kayford, W. Va.
SM—C. E. Campbell....Kayford, W. Va.
S of H—Gravity, mules and 3 elec. loco. Track gauge 44 in.
S of M—8 Elec. machines.
PP—Power purchased.
EMP—60. Last fiscal year output 159,299 tons.

Thistle and Shamrock Mines, Drifts, No. 2 Gas Seam, 4 ft. 11 in. to 6 ft. thick.
PO—Kayford, W. Va., SP—Same. CTY—Kanawha RR—C. & O. Cabin Creek. Br.
MS—H. L. Fisher ....Kayford, W. Va.
SM—C. E. Campbell....Kayford, W. Va.
S of H—Mules and 3 elec. loco. Track gauge 44 in.
S of M—Hand and 10 Elec. mach.
PP—Power purchased.
EMP—150. Last fiscal year output 199,138 tons.

Rose Mine, Drift, Coalburg Seam, 5½ to 6 ft. 9 in thick.
PO—Kayford, W. Va., SP—Same, CTY—Kanawha. RR—C. & O. Cabin Creek Br.
MS—H. L. Fisher .. ..Kayford, W. Va.
SM—C. E. Campbell....Kayford, W. Va.
S of H—Gravity, mules, and 1 elec. loco. Track gauge 44 in.
S of M—Hand and 6 Elec. mach.
PP—Power purchased.
EMP—55. Last fiscal year output 78,203 tons.

Acme Mine, Drift, Coalburg Seam, 4 ft. 7 in. to 5 ft. 7 in. thick.
PO—Acme, W. Va. SP—Same. CTY—Kanawha. RR—C. & O., Cabin Creek Branch.
MS—W. A. Otey..........Acme, W. Va.
SM—S. V. Johnson.......Acme, W. Va.
S of H—Gravity, mules and 1 elec. loco. Track gauge 42 in.
S of M—Pick, and 2 elec. machines.
PP—Power purchased.
EMP—35. Last fiscal year output 35,774 tons.

Keystone, Empire, Buckeye and Black Tulip Mines, Drifts No. 2 Gas Seam, Keystone, 4 to 5½ ft. thick. Empire, 3 ft 8 in. to 5 ft. 8 in. thick. Buckeye, 4 ft. 2 in to 5 ft. 8 in. thick. Black Tulip, 4 ft. 2 in. to 5 ft. 9 in. thick.
PO—Acme, W. Va. SP—Same. CTY —Kanawha. RR—C. & O.
MS—W. A. Otey..........Acme, W. Va.
SM—S. V. Johnson......Acme, W. Va.
S of H—Gravity, Mules and 5 elec. loco. Track gauge 42 inches.
S of M—Pick and 16 elec machines.
PP—Power purchased. 1 pump.
EMP—Keystone 25; Empire 45; Buckeye 50; Black Tulip 60. Last fiscal year output. Keystone 12,414 tons; Empire 21,752 tons; Buckeye 67,897 tons; Black Tulip 69,380 tons.

Red Warrior Mine; Drift, No. 2 Gas Seam, 42 to 72 in. thick.
PO—Warrior, W. Va.; SP—Red Warrior, W. Va.; CTY—Kanawha; RR—C. & O., Cabin Creek Br.
MS—W. H. Morris....Leewood, W. Va.
SM—M. T. Long......Warrior, W. Va.
S of H—1 Elec. loco. and mules; track gauge 48 in.
S of M—3 Elec. mach.
PP—Power purchased.
EMP—25. Last fiscal year output 29,194 tons.

Cherokee Mine, Drift, No. 2 Gas Seam, 4 ft. 5 in. to 5 ft. 3 in. thick.
PO—Leewood, W. Va.; SP—Cherokee, W Va.; CTY—Kanawha; RR—C. & O., Cabin Creek Br.
MS—W. H. Morris......Leewood, W. Va
SM—H. W. Wilson, " "
S of H—Gravity, mules and elec. loco.. track gauge, 44 in.
S of M—Pick and 6 elec. mach
PP—Purchase power.
EMP—60. Last fiscal year output 76,656 tons.

Davis Mine, Drift, Lwiston Seam, 4 ft. 5 in. to 6 ft. thick.
PO—Ohley, W. Va., SP—Same, CTY—Kanawha. RR—C. & O.. Cabin Creek Branch.
MS P. L. Rose.........Ohley, W. Va.
SM—K. A. Atkinson, " "
S of H—Gravity, mules and 1 elec. loco., track gauge 44 in.
S of M—Pick, and 4 elec. mach.
PP—Purchase power. 11 pumps.
EMP—60. Last fiscal year output 49.599 tons.

Holly Mine, Drift, No. 2 Gas Seam, 4 ft. 5 in. to 5 ft. 3 in. thick.
PO—Leewood, W. Va.; SP—Holly, W Va.; CTY—Kanawha; RR—C. & O., Cabin Creek Br.
MS—W. H. Morris......Leewood, W. Va.
SM—B. H. Dorsey, " "
S of H—Gravity, mules and air hoist Track gauge 44 in.
S of M—Pick and 5 compressed air machines.
PP—Power purchased. 2 air comp.
EMP—35. Last fiscal year output 41,851 tons.

Quarrier Mine; Drift, No. 2 Gas Seam, 55 to 74 in. thick.
PO—Wake Forest, W. Va.; SP—Quarrier, W. Va.; CTY—Kanawha; RR—C. & O., Cabin Creek Br.
MS—W. H. Morris....Leewood, W. Va.
SM—J. M. Walton..Wake Forest, W. Va.
S of H—Mules and air hoist; track gauge 44 in.
S of M—5 Comp. air mach. and hand.
PP—Purchase power.
EMP—50. Last fiscal year output 53,406 tons.

Bellclare and Ruby Mines, Drifts, Bellclare No. 2 Gas Seam 4 ft. 1 in. to 5 ft. 9 in. thick. Ruby Mine, Coalburg Seam, 4 ft. 8 in. to [illegible] ft. 1 in. thick.
PO—Decota, W. Va., SP—Same, CTY —Kanawha. RR—C. & O., Cabin Creek Branch.
MS—H. H. Davis,....Decota, W. Va.
SM—S. F. McConihay, " "
S of H—Gravity, mules and 3 elec. loco. track gauge 44 in.
S of M—Pick and 6 elec. machines.
PP—Power purchased.
EMP—Bellclare 60; Ruby 55. Last fiscal year output Bellclare 64,952 tons; Ruby 74,394 tons.

United No. 1 and No. 2 Mines, Drifts, United No. 1, No. 2 Gas Seam, 4 ft. 10 in. to 5 ft. 3 in. thick. United No. 2, Coalburg Seam, 4½ to 6½ ft. thick.
PO Wevaco, W. Va.; SP—United, W. Va.; CTY—Kanawha; RR—C. & O., Cabin Creek Br.
MS—Jas. E. Staton......Wevoca, W. Va.
SM—E. S. Baker " "
S of H—Gravity, mules, and 3 elec. loco., track gauge 44 in.
S of M—Pick, and 5 elec. mach.
PP—Power purchased.
EMP—United No. 1, 80; United No. 2, 65. Last fiscal year output No. 1, 142,794 tons; United No. 2, 87,314 tons.

CALIF COAL CO.
Calif Mine, Drift, Redstone & Pgh. Seam 5½ to 6 ft. thick.
PO—Lost Creek, W. Va.; SP— Same, CTY—Harrison. RR—B. & O.
PR—A. C. Leisenring, Lost Creek, W. Va.
GM—A. C. Leisenring, " "
TR—A. C. Leisenring, " "
MS—Robert Wilson, " "
CE—D. D. Britt..Clarksburg, W. Va.
SCO—Calf Store. Buyer, H. C. Clevenger, Lost Creek, W. Va.
S of H—1 Gasoline loco. and mules.
S of M—Hand and 2 elec. mach.
PP—Buy power.
EMP—60. Last fiscal year output 70,568 tons.

CAMPBELL'S CREEK COAL CO.
General Office, Cincinnati, O.
Nos. 1 and 3 Mines; Drift; No. 5 Seam, 5 to 6½ ft. thick. operate washeries.
PO—Putney, W. Va.; SP—Dana, W. Va.; CTY—Kanawha. RR—K. & M., Campbell's Creek R.R.Co.
PR—S. F. Dana......Cincinnati, O.
TR—E. O. Dana, " "
GM—R. P. Gillham, " "
MCR of Mines, W. V. Rensford, Dana, W. Va.
MM—W. H. Canterbury, " "
EM—M. W. Venable, Charleston, W. Va.
MS—Ed. Williams......Putney, W. Va.
SM—A. M. Putney, "
S of H—10 Elec. loco.; track gauge 44 and 56½ in.
S of M—16 Elec. mach.
PP—Power purchased.
EMP—397. Last fiscal year output 396,000 tons.
Sales agent, Campbells Creek Coal Co., Cincinnati, O.

CANNELTON COAL & COKE CO.
General Office, Cannelton, W. Va.
PR—W. C. Franz, Sault Ste. Marie, Ont.
TR—A. A. Chitty, " " " "
GM—W. C. Franz, " " " "
GS—F. O. Harris, Cannelton, W. Va.
PA—F. O. Harris, " "
CE—E. B. Farrand, " "
EE—P. S. Nunnally, " "
MS—Henry Deem, " "
SM—T. M. Scott, " "
Sales Agents, E. A. Cole & Co., Columbus, Ohio.

Cannelton No. 1, Drift, No. 2, Kanawha Gas Seam, 5½ to 7 ft. thick.
PO—Cannelton, W. Va., SP—North Cannelton, W. Va., CTY—Fayette. RR—K. &M. Smithers Creek Br.
S of H—Mules, hand, 4 elec. loco., gauge 39 in.
S of M—Hand, and 9 elec. machines.
PP—5 Return tubular boilers, total 750 H.P., 2 gen. units, 250 volts, 400 K. W., 3 pumps.
EMP—450. 90 Bee Hive coke ovens, (not in use) Last fiscal year output 270,870 tons.

Cannelton No. 2, Drift, No. 2 Kanawha Gas Seam, 5½ to 7¼ ft. thick.
PO—Cannelton, W. Va.. SP—North Cannelton, W. Va., CTY—Fayette. RR—K. &M., Smithers Creek Br.
S of H—Mules and 6 elec. loco. track gauge 39 in.
S of M—Hand and 8 elec. machines.
PP—2 Pumps. Power furnished by Virginia Power Co.
EMP—450. Last fiscal year output 229,633 tons.

Cannelton No. 3, Drift, No. 1 Gas, "Eagle Seam" 3½ to 5 ft. thick.
PO—Cannelton, W. Va.. SP—North Cannelton. W. Va.. CTY—Fayette. RR—K. &M., Smithers Creek Br.
S of H—2 Elec. loco., track gauge 39 in.
S of M—2 Elec. machines.
PP—1 Pump. Power furnished from No. 1 Mine Power House.
EMP—18. Last fiscal year output 13,118 tons.

Cannelton No. 4, Drift, No. 2 Kanawha Gas Seam, 4 to 6 ft. thick.
PO—Cannelton, W. Va., SP—North Cannelton. W. Va., CTY—Fayette. RR—K. &M., Smithers Creek Br.
S of H—3 Elec. loco., track gauge 39 in.
S of M—4 Elec. machines.
PP—1 Pump. Power furnished by Virginian Power Co.
EMP—34. Last fiscal year output 46,560 tons.

CAPITOL COAL CO.
General Office, 712 Park Bldg., Pittsburgh. Pa.
Drift Mine, Pittsburgh Seam; 62 in. thick.
RR—W. P. T., Main line.
PR—C. W. Hays, Park Bldg., Pittsburgh, Pa.
TR—A. M. Lowe, Park Bldg., Pittsburgh, Pa.
PA—A. M. Lowe, Park Bldg., Pittsburgh, Pa.
S of H—Will be electric.
Note—Making survey for sidings. Will start development soon.

CARBON COAL COMPANY
General Office, Carbon, W. Va.
PR—J. R. Thomas...Charleston, W. Va.
TR—C. A. Cabell.......Carbon, W. Va.
GM—C. A. Cabell, " "
PA—E. B. Pearse, " "
MS—K. D. Quarrier, " "
EE—K. D. Quarrier, " "
EM—K. M. Quickel, " "
Auditor—E. C. Hanna, " "
SM—S. F. Collins, " "
SM—G. K. Cabell.....Wevaco, W. Va.
SCO—Carbon Coal Co. Stores.

Splint Mine; Drift; Acme or Coalburg Seam; 54 to 78 in. thick.
PO—Carbon, W. Va.; SP—South Carbon, W. Va.; CTY—Kanawha; RR—C. & O.; Cabin Creek branch.
SM—S. F. Collins......Carbon, W. Va.
S of H—Mules and 4 elec. locos. Track gauge 42 in.
S of M—4 elec. machs.
PP—Purchase power.
EMP—100. Last fiscal year output 112,100 tons.

South Mine; Drift; No. 2 Gas Seam; 42 to 66 in. thick.
PO—Carbon, W. Va.; SP—South Carbon; CTY—Kanawha; RR—C. & O., Coal Creek branch.
SM—S. F. Collins.....Carbon, W. Va.
S of H—Mules and 3 elec. loco. Track gauge 42 in.
S of M—3 elec. mach.
PP—Purchase power.
EMP—50. Last fiscal year output 37,800 tons.

Eagle Mine; Drift; No. 1 Gas Seam; 36 to 64 in. thick.
PO—Nabob, W. Va.; SP—Same; CTY—Kanawha; RR—C. & O., C. C. branch.
SM—A. G. Burns.......Nabob, W. Va.
S of H—Mules and 1 elec. and 1 storage battery loco. Track gauge 42 in.
S of M—2 elec. mach.
PP—Purchase power.
EMP—40. Last fiscal year output 26,200 tons.

CARROLL—CROSS COAL CO.
General Office, Bloomington, Md.
Black Diamond and Imperial Mines; Drift; Freeport Seam, 5 ft. to 5 ft. 8 in. thick.
PO—Emoryville, W. Va.; SP—Same; —CTY—Mineral. RR—W. M., Elk Garden Br.
PR—Carroll Pattison, Bloomington, Md.
TR—Carroll Pattison, " "
PA—Carroll Pattison, " "
GM—Howard Cross, Emoryville, W. VA.
MS—Howard Cross, " "
PA—Howard Cross, " "
SM—H. H. Cross, ..Emoryville, W. Va.
S of H—Mules; track gauge 36 in.
S of M—Hand.
EMP—70. Last fiscal year output 39,391.06 tons.

CARTER COAL CO.
General Office, Coalwood, W. Va.
4 Mines in West Virginia, 4 mines in Ky.
PR—Geo. L. Carter....Coalwood, W. Va.
TR—C. A. Hall, " "
VP—M. W. Carter, " "
PA—M. M. King, " "
EM—C. E. Bullock.......Warren, Ky.
SCO—Carter Coal Co. Buyer, M. M. King, Coalwood, W. Va.

Caretta Mine, Drift, War Creek Seam, 4 to 5½ ft. thick.
PO—Caretta, W. Va.; SP—Susanna, W. Va., CTY—McDowell. RR—N. & W., Dry Fork Branch.
MS—F. A. Garth......Coalwood, W. Va.
SM—Jas. L. Martin, Yukon, W. Va.
S of H—8 Elec. loco., track gauge 48 inches.
S of M—Elec. machines.
PP—Power purchased. 2 pumps.

Thelma Mine, Drift, Sewell Seam, 3½ to 5½ ft. thick
PO—Coalwood, W. Va., SP—Same, CTY—McDowell. RR—N. & W., Clear Fork Branch.
MS—F. A. Garth......Coalwood, W. Va.
SM—J. V. Bowman, " "
S of H—7 Elec loco., track gauge 48 in.
S of M—Elec. machines.
PP—Power purchased. 2 pumps.

Nora, Coalwood 2 and 3, Drifts, Lambert of Welch Seam, 3½ to 6 ft. thick.
PO—Coalwood, W. Va., SP—Same, CTY—McDowell. RR—N. & W., Clear Fork Branch.
MS—F. A. Garth......Coalwood, W. Va.
S of M—Elec. machines.
PP—Power purchased.
S of H—Elec., track gauge 48 in.

CATAWBA COAL CO.
General Office, Connellsville, Pa.
Catawba Mine, Drift, Pittsburgh Seam, 9 ft. thick.
PO—Catawba, W. Va. SP—Same. CTY—Marion. RR—B. &O., F. M. & P. Branch.
PR—Jno. J. Buttermore, Connellsville.Pa
TR—J. M. Herpick, " "
PA—J. M. Herpick, " "
GM—John J. Buttemore, " "
GS—U. G. Swissher, Catawba, W. Va.
S of H—Mules; track gauge 42 in.
S of M—Hand.
EMP—18. Last fiscal year output 15,448.

CENTRAL COAL COMPANY
General Office Crown Hill, W. Va
Crown Hill Mine; Drift Coalburg Seam; 0 to 84 in. thick.
PO—Crown Hill, W. Va; SP—Hansford, CTY—Kanawha; RR—C. & O.
TR—H. B. Stewart......Pittsburgh, Pa.
GM—H. T. Smarr...Charleston, W. Va
S of H—2elec. loco.
S of M—5 chain breast mach.
PP—2 boilers, total 1,250 H. P., 1 gen. unit, 250 volts D. C.
EMP—110.
Note—Successors to National Bituminous Coal & Coke Co.

CENTRAL FAIRMONT COAL CO.
Snake Hill Mine, Drift, Pittsburgh No. 8 Seam, 9 ft. thick.
PO—Clarksburg, W. Va., SP—Same, CTY—Harrison. RR—B.&O.
PR—D. Howard.....Clarksburg, W. Va.
TR—D. Howard....Clarksburg, W.Va.
GM—D. Howard, " "
PA—D. Howard, " "
MS—Frederick Howard, " "
EM—D. D. Britt, " "
S of H—Mules and 2 gasoline loco. Track gauge 42 in.
S of M—2 Elec. mach.
PP—Power purchased.
EMP—78. Last fiscal year output 80,000 tons.
Sales Agent, D. Howard, Clarksburg, W. Va.

CENTRAL POCAHONTAS COAL CO.
General Offices Welch, W. Va.
Nos. 1 & 2 Mines; Drifts; Pocahontas No. 3 Seam; 72 to 96 in. thick.
PO—Anawalt, W. Va.; SP—Jeanette and O'Toole; CTY—McDowell; RR—N. & W., Tug Fork branch.
PR—L. E. Woods.......Welch, W. Va.
TR—W. J. O'Toole, " "
PA—W. J. O'Toole, " "
GM—H. T. Graham...Anawalt, W. Va.
MS—H. T. Graham, " "
CE—H. W. Saunders.....Welch, W. Va.
EM—H. W. Saunders, " "
S of H—2 elec. loco. Track gauge 48 in.
S of M—2 elec. mach.
PP—1 pump. Purchase power.
EMP—300. Last fiscal year output 111,453 tons.

CENTURY COAL CO. OF WEST VIRGINIA
General Office, 10 South St., Baltimore, Md.
Century Nos. 1 and 2 Mines. Shaft and Drift; Red Stone Seam, 66 in. thick.
PO—Century, W. Va. SP—Same. CTY - Barbour; RR—B. & O., Century branch.
PR—John K. Shaw......Baltimore, Md.
TR—W. J. McBride, " "
GM—Benj. Bissell.....Baltimore, Md.
SUPT—John Phillips..Century, W. Va.
MS—John Phillips....Century, W.Va.
EM—A. B. Johnson, " "
S of H—5 elec. loco. and 1 gasoline loco.
S of M—15 elec. mach.
PP—4 water tube boilers, total 600 H. P., 275 volts D. C. and 2300 volts A. C.
EMP—500.

CHESAPEAKE MINING CO.
General Office Handley, W. Va.
PR—J. Q. Dickson, ..Charleton, W. Va.
TR—Malcolm Jackson, " "
GS—Robert J. Wood....Handley, W. Va
PA—Robert J. Wood, " "
MS—Robert J. Wood, " "
CE—B. M. Green....Charleston, W. Va
EM—B. M. Green, " "
MM—J. L. Gunter,....Handley, W. Va.
EE—J. L. Gunter, " "
SM—H. O. Lockman, " "
SCO—Chesapeake Mining Company Store, Handley, W. Va.

No. 1 Mine; Drift; Kanawha or Winifred Seam; 44 to 60 in. thick.
PO—Handley, W. Va.; SP—Same; CTY—Kanawha; RR—C. & O.
S of H—Mules and 3 elec. locos. Track gauge 42 in.
S of M—7 elec. mach.
PP—Purchase power.
EMP—130. Last fiscal year output 71,408 tons.

No. 4 Mine; Drift; Kanawha or Winifred Seam; 30 to 48 in. thick.
PO—Handley, W. Va.; SP—Same; CTY—Kanawha; RR—C. & O.
S of H—Mules and 1 elec, loco. Track gauge 42 in.
S of M—4 elec. mach.
PP—Purchase power.
EMP—70. Last fiscal year output 14,187 tons.

CHRISTIAN COLLIERY CO.
Christian Mines Nos. 1 and 2, Drifts, Big Eagle and Powellton Seam, 4 to 6 ft. thick.
PO—Mahan, W.Va., SP—Same, CTY—Fayette. RR—C. & O., Paint Creek Branch.
PR—F. P. Christian, Lynchburg, Va.
TR—Giles H. Miller, " "
GM—Quin Morton,...Burnwell, W.Va.
PA—Quin Morton, " "
GS—F. H. Morton, " "
EM—R. B. Whittaker, Milburn, W.Va.
SM—M. F. Forgery.....Mahan, W.Va.
S of H—6 elec. loco., track gauge 44 in.
S of M—7 elec. machines.
PP—2 return tubular boilers, total 300 H. P. 1 pump.
EMP—150. Last fiscal year output 120,000 tons.
Sales agent, Quin Morton, Burnwell, W. Va.

CIRRUS COAL & COKE CO.
General Office, Pocahontas, Va.
Cirrus No. 2 Mine.
PO—Big Four, W. Va. CTY—McDowell.
GM—J. E. James, Switchback, W. Va.
PA—D. W. Garwood .Pocahontas, W. Va.
MS—Arthur Mitchell, Big Four, W. Va.
Note—Mine shut down.

CITY COAL CO.
Combs Mine, Drift, Sewell Seam, 3 ft. to 3 ft. 5 in. thick.
PO—Beckley, W. Va., SP—Same, CTY—Raleigh. RR—Pine River & Paint Creek, Branch of C.& O.
GS—B.H.White,(Owner) Beckley,W.Va.
EM—Geo. Wilson, " "
SM—B. H. White, " "
S of H—Mules, 2 Steam loco.; track gauge 34 inches.
S of M—Hand.
PP—2 boilers, total 300 H. P., 4 pumps
EMP—30. Sale Agents, West Va. Coal Co., Richmond, Va.

CLARKSBURG COAL MINING CO.
General Office, Clarksburg, W. Va
Florida Mine; Slope, Pgh. Seam, 84 in thick.
PO—Reynoldsville, W. Va; SP—Wolf Summit, W. Va.; CTY—Harrison; RR—B. & O., Main line.
PR—J. T. Morrison..Clarksburg, W. Va.
TR—J. O. Miller, " "
GM—Carl L. Hornor, " "
GS—Wayne B. Hornor, " "
PA—Wayne B. Hornor, " "
CE—Hornor Bros., " "
MM—Ward Randolph, " "
MS—Thos. Hogarth Reynoldsville, W. Va.
S of H—Gasoline and steam loco., mules and rope; track gauge 42 in.
S of M—5 comp. air mach.
PP—3return tubular boilers, total 375 H. P., 1 comp., 2 pumps
EMP—60. Last fiscal year output 40,000 tons
Successors to the East Coast Coal Mng. Co.

CLAYBROOK COAL MINING CO.
Out of business.

CLEAR FORK COAL CO.
Leevale Mine, Drift, Dorothy Seam, 4 to 8 ft. thick.
PO—Jarrolds Valley, W.Va., SP—Leevale, CTY—Raleigh. RR—C. & O., Cabin Creek Branch.
PR—John S. Weakland, Charleston,W.Va
TR—John S. Weakland, " "
EM—J. T. B. Eaton, " "
PA—John S. Weakland Charleston, W.Va.
GS—J. W. Branham, Jarrolds Valley, W. Va.
MM—John Roysden, Jarrolds Valley, W. Va.
SCO—Clear Fork Coal Co. Buyer, Bruce Y. Branham, Jarrold's Valley, W. Va.
S of H—3 Elec. loco., track gauge 42 in.
S of M—3 Elec. machines.
PP—Buy power.
EMP—100. Last fiscal year output 93,000 tons.

Sales Agents, The Webb Fuel Co., Cincinnati, Ohio.

COAL BELL COAL CO.
Trees and Benedum Mines; Drifts, Belmont Seam, 54 to 55 in. thick.
PO—Bentree, W.Va.; SP—Same; CTY—Clay; RR—C. & O., Gauley Branch.
PR—M. C. Benedum, Pittsburgh, Pa.
TR—Ralph E. Flinn, " "
GM—S. M. Dunbar, Bentree, W.Va.
PA—S. M. Dunbar, " "
GS—W. G. Warwick, " "
MS—H. C. Harvey, " "
CE—W. Chrichton...Charleston, W. Va.
MM—J. H. Belcher, ..Bentree, "
EE—J. H. Belcher, " "
SM—G. W. Wiseman...Bentree, W. Va.
S of H—5 elec. loco, 2 storage batteries.
S of M—16 elec. mach.
PP—2 Erie water tube boilers, total 300 H.P., 2 gen. units 250 volts D.C.
EMP—130. Last fiscal year output 110,000 tons.
Sales Agency, John T. Hesser, Cincinnati, O.

COAL RIVER COAL CO., (THE)
Now Monto Coal Co.

COAL RIVER COAL & COKE CO.
General Office, Huntington, W. Va.
Dobra Mine, Dift, No. 2 Gas Seam, 5½ ft. thick.
PO—Dobra, W. Va., SP—Clothier, W.Va., (final destination Dobra) CTY—Logan. RR—C.&O., Coal River Branch.
PR—Paul Hardy,..Huntington, W.Va.
TR—C. P. Donovan, " "
GM—Paul Hardy, " "
PA—C. P. Donovan, " "
MS—B. J. Hiner......Dobra, W.Va.
MF—G. W. Lax, " "
SCO—Coal River Coal & Coke Co., Buyer, B. J. Hiner, Dobra, W. Va.
S of H—5 Elec. loco.; track gauge 44 inches.
S of M—5 Elec. mach.
PP—1 Erie return tubular boiler 200 H. P., 1 Engine and 1 gen. unit, 250 volts D. C., 1 pump.
EMP—100. Last fiscal year output, 150,000 tons.
Sales Agency, Burlington Coal Co., Cincinnati, O.

COAL RIVER COLLIERY CO.
General Office, Huntington, W. Va.
Marion Mine; Drift No. 2 Gas Seam, 54 to 60 in. thick.
PO—Bloomingrose, W. Va.; SP—Cedar Hill; CTY—Boone RR—C. & O., Coal River Branch.
PR—W. C. Sharpe,..Huntington, W. Va.
GM—W. C. Sharpe, " "
CE—W. C. Sharpe, " "
TR—A. P. Sharpe, " "
GS—Frank Kerns, Bloomingrose, W. Va.
PA—Frank Kerns, " "
MS—Frank Kerns, " "
EM—T. L. Johnson, " "
MM—T. L. Johnson, " "
EE—T. L. Johnson, " "
S of H—1 elec. loco.
S of M—2 elec. mach.
PP—1 return tubular boiler, total 100 H. P., 1 gen. unit, 250 volts D. C.
EMP—20.
Ship coal June 1st, 1916.

COAL VALLEY MINING CO.
General Office, Charleston, W. Va.
Sylvia Mine; Drift, Chilton Seam, 58 to 66 in. thick.
PO—Clothier, W. Va.; SP—Same; CTY—Logan; RR—C. & O., Coal Run Div.
PR—A. E. Moore....Charleston, W.Va.
TR—A. E. Moore, " "
GM—A. E. Moore, " "
PA—A. E. Moore, " "
MS—F. L. Vermilion..Clothier, W. Va
EM—H. M. Eaton, " "
EE—Jas. Walker, " "
SCO—Coal Valley Mng. Co. Store. Buyer, W. F. Clark, Clothier, W. Va.
S of H—3 elec. loco. Track gauge 42 in.
S of M—4 elec. mach.
PP—1 pump. Power purchased.
EMP—66. Last fiscal year output 99,000 tons.

COALBURG COLLIERY CO.
General Office, Ronda, W. Va.
Ronda Mine, Drift, Coalburg Seam, 72 in. thick.
PO—Ronda, W. Va. SP—Same. CTY—Kanawha. RR—C.& O.
PR—J. Q. Dickinson, Charleston.W.Va
TR—L. D. Burns ......Ronda, W.Va.
GM—L. D. Burns, " "
PA—R. A. Teamster " "
MS—C. F. Slack, " "
CE—B. M. Green, " "
EM—B. M. Green, " "
MM—R. D. Miller, " "
EE—R. D. Miller, " "
SCO—Ronda Store. Buyer, N. L. Furrell, Ronda, W. Va.
S of H—Mules and 3 elec. loco.
S of M—4 elec. mach.
PP—250 volts A. C. Purchase power.
EMP—300. Last fiscal year output 146,000 tons.
Sales Agency, C. & O. C. & C. Co.

COALBURG-KANAWHA COAL CO.
A and B Mine, Drifts, A Mine, Coalburgh Seam, Lower Freeport, 6 ft. thick. B Mine, Belmont Seam, Up. Freeport, 3 3-4 ft. thick.
PO—Coalburgh, W. Va., SP—Same, CTY—Kanawha. RR—Ches. & Ohio, Main Line.
GM—J. A. Willis....Coalburgh, W. Va.
GS—J. A. Willis, " "
EE—J. S. Edwards, " "
SM—Fred W. McConnell, " "
TR—Fred Stanton....Charleston, W. Va.
EM—J. B. T. Eaton, Clothier, W. Va.
S of H—Mules, and 2 elec. loco., track gauge 40 in.
S of M—5 Elec. machines.
PP—2 Return tubular boilers, 250 H. P., 1 gen. unit 270 volts D C.
EMP—125. Last fiscal year output 107,000 tons.
Sales Agency, Burlington Coal Co., Cincinnati, O., and E. J. Hickey Transportation Co., Covington, Ky.

COLONIAL POCAHONTAS COAL COMPANY
Drift Mine; Welch Seam; 36 to 48 in. thick.
PO—Avondale, W. Va.; SP—Ritter, W. Va.; CTY—McDowell; RR—N. & W., Dry Fork branch.
PR—P. W. Barricklow, Avondale, W. Va.
TR—P. W. Barricklow, " "
GM—W. H. Plant, " "
MS—Don Barricklow, " "
EM—M. Cooper, " "
SM—A. W. Clarkson, " "
S of H—1 gasoline loco.
S of M—Hand.
PP—Purchase power.
EMP—40. Last fiscal year output, 32,000 tons.

COLUMBUS IRON & STEEL CO., (THE)
General Office, Columbus, Ohio.
No. 1 Mine, Drift, No. 2 Gas Seam, 5 to 6 ft. thick.
PO—Marting, W. Va., SP—Same, CTY—Fayette. RR—K. & M.
PR—J. G. Battelle.....Columbus, O.
TR—J. C. Miller, " "
GM—J. H. Frantz, " "
PA—R. A. Magley, " "
MM—Jesse Pennington..Marting, W. Va.
EE—Jesse Pennington, " "
MS—H. A. Jepson, " "
SCO—Buyer, C. A. Barnett, Marting, W. Va.
S of H—6 Elec. loco., track gauge 42 in.
S of M—8 Elec. mach.
PP—4 Erie City return tubular boilers, total 600 H. P., 2 gen. units 250 volts D. C., 3 pumps.
EMP—260. Coke ovens, 84 Bee Hive. Last fiscal year output 169,904 tons.
Sales Agent, J. C. Miller, Columbus, O.

CONNELLSVILLE BASIN COKE CO.
Controlled by Receivers of (Central Iron & Steel Co.)
General Office, Harrisburg, Pa.
Slope Mine; Up. Freeport Seam, 50 to 53 in. thick.
PO—Rock Forge, W. Va.; SP—Richard, W. Va.; CTY—Monongalia; RR—M. & K.
PR—Francis J. Hall....Harrisburg, Pa.
TR—L. D. Perry, " "
SCO—Deckers Creek Supply Co., Rock Forge, W. Va.
Coke ovens 200 Bee Hive.
Operations discontinued since June 30, 1913. May start again if market condition change.

CONSOLIDATION COAL CO., THE
General Office, Continental Building, Baltimore, Md.
101 Mines in Md., West Va., Pa., and Ky.
Chairman of Board, C. W. Watson, Baltimore, Md.
PR—J. H. Wheelwright, " "
Secy—T. K. Stuart, " "
Mgr. of Trans—W. L. Andrews," "
Genl. Auditor—A. S. Dunham," "
VP—F. S. Landstreet, Bankers Trust Bldg., New York, N. Y.
VP—Geo. T. Watson..Fairmont, W. Va.
TR—S. L. Watson, " "
GM—F. R. Lyon, " "
Asst. GM—Brooks Fleming, Jr. Fairmont, W. Va.
PA—A. T. Watson, " "
PA—Asst., F. C. Davis, " "
CE—Frank Haas, " "
CE—Asst., J. C. Gaskill, " "
Chief Engineer, All Divisions—John G. Smyth ....Fairmont, W. Va.
Supt. P. & M. Dept.—R. L. Kingsland, Fairmont, W. Va.
Eng. of Tests—R. E. Rightmire, Fairmont, W. Va.
Live Stock Buyer—Frank Amos, Fairmont, W. Va.
Genl. Mgr. of Sales—F. W. Wilshire, Bankers Trust Bldg., New York, N.Y.
Western Mgr. of Sales—E. M. Mancourt, Fisher Bldg., Chicago Ill.

OFFICIALS OF WEST VIRGINIA DIVISION
MGR—C. H. Tarleton..Fairmont, W. Va.
Div. Eng—F. K. Day, " "
Asst. Div. Eng—L. A. Riggs, " "
Local Auditor—M. E. Ashcraft, Fairmont, W.Va.
Gen SM—Frank Neely, " "

Consolidation No. 30 Mine; Drift; Pittsburgh Seam, 81 to 102 in. thick.
PO—Beechwood, W. Va.; SP—Consolidation No. 30, W. Va.; CTY—Monongalia; RR—B. & O.
MS—W. H. Hess......Beechwood, W.Va.
SM—Chas. Barker, " "

(Continued on Next Page)

Consolidation Coal Co. (The)—Cont.
S of H—Mules and 1 Elec. loco.; track gauge 42 in.
S of M—Hand and 1 Elec. mach.
PP—1 Erie City Return tubular boiler, 150 H. P., 1 100 K. W. generator, 250 volts D. C.
EMP—41. Coke ovens, 46 Bee Hive. Last fiscal year output 35,000 tons.

Consolidation No. 45 Mine; Drift; Pittsburgh Seam, 84 to 103 in. thick.
PO—Scottdale, W. Va.; SP—Consolidation No. 45, W. Va.; CTY—Marion; RR—B. & O.
MS—W. H. Hess......Scottdale, W.Va.
SM—E. J. Hunsaker, " "
S of H—Mules and rope; track gauge 42 in.
S of M—Hand and 2 Elec. mach.
PP—2 Erie City return tubular boilers, total 225 H. P., 1 100 K. W. generator 250 volts D. C., 1 pump.
EMP—49. Coke ovens, 49 Bee Hive. Last fiscal year output 43,500 tons.

Consolidation No. 24 Mine; Drift; Pittsburgh Seam, 74 to 89 in. hick.
PO—Montana Mines, W. Va.; SP—Consolidation No. 24, W. Va.; CTY—Marion; RR—B. & O.
MS—R. E. Garrett, Montana Mines, W.Va.
SM—C. H. Bartlett, " "
S of H—Mules, rope and 2 Elec. loco.; track gauge 41 in.
S of M—Hand and 9 Elec. mach.
PP—1 Hart Bros., and 5 Erie City return tubular boiler, total 730 H. P., 1—150 K. W. generator, 250 volts D. C., 1 pump.
EMP—106. Coke ovens, 150 Bee Hive. Last fiscal year output 95,191 tons.

Consolidation No. 38 Mine; Shaft; Pittsburgh Seam, 80 to 103 in. thick.
PO—Fairmont, W. Va.; SP—Consolidation No. 38, W. Va.; CTY—Marion; RR—B. & O.
MS—John C. Riggins...Fairmont, W.Va.
SM—W. J. LaFollette, " "
S of H—Mules, rope and 2 Elec. loco.; track gauge 42 in.
S of M—Hand and 8 Elec. mach.
PP—2 Brownell, 5 Erie City return tubular boilers, total 780 H. P., 1 150 K. W. Rot. 250 volts D. C., 6 phases, 60 cycles, 3 pumps. Purchase power.
EMP—222. Coke ovens, 36 Bee Hive. Last fiscal year output 165,560 tons.

Consolidation No. 26 Mine; Drift; Pittsburgh Seam, 78 to 108 in. thick.
PO—Watson, W. Va.; SP—Consolidation No. 26, W.Va.; CTY—Marion; RR—B. & O.
MS—John C. Riggins....Watson, W.Va.
SM—J. C. Crawford, " "
S of H—Mules and 5 Elec. loco.; track gauge 42 in.
S of M—Hand and 14 Elec. mach.
PP—3 Hart Bros., 5 Erie City return tubular boilers, total 1000 H. P., 2 150 K. W. generators, 3 150 K. W. Rot. 250 volts D .C., 3 phases, 60 cycles, 2 pumps. Central station for rotaries.
EMP—314. Coke ovens, 94 Bee Hive. Last fiscal year output 295,230 tons.

Consolidation No. 56 Mine Drift; Pittsburgh Seam, 91 to 101 in. thick.
PO—Watson, W. Va.; SP—Consolidation No. 56, W. Va.; CTY—Marion; RR—B. & O.
MS—John C. Riggins......Watson, W.Va
SM—J. C. Crawford, " "
S of H—Mules, rope and 2 Elec. loco.; track gauge 36 in.
S of M—Hand and 8 Elec. mach.
PP—1 Erie City, 2 Gem City, 1 Hart Bros. return tubular boilers, total 360 H. P., 1 150 K. W. Rotary 250 volts D. C., 3 phases, 60 cycles, 1 pump. Central station for rotary and 1000 gal. pump.
Coke ovens, 89 Bee Hive. Last fiscal year output 53,762 tons.

Consolidation Nos. 53 22, 43, 63 Mines; Drifts and Slope; Pittsburgh Seam, 84 to 103 in. thick.
PO—Monongah, W. Va. SP—Same; CTY—Marion; RR—B. & O.
MS—Geo. E. Peddicord, Monongah, W.Va.
SM—C. E. Bartlett, " "
S of H—Mules, rope 1 Sorage battery and 18 Elec. loco.; track gauges 42 in.
S of M—Hand and 31 Elec mach.
PP—1 Monroe, 19 Erie City, 1 Gem City, return tubular boilers, total 2580 H. P., 4 150 K. W. Rotaries, 3 150 K. W. generators 250 volts D. C. 6 phase, 60 cycles, and 3 phase, 60 cycles, 9 pumps. Central station for rotaries and 1000 gal. pump.
EMP—1083. Coke ovens, 270 Bee Hive. Last fiscal year output 1,225,445 tons.

Consolidation No. 68 Mine; Drift; Pittsburgh Seam, 81 to 98 in. thick.
PO—Everson, W. Va.; SP—Consolidation No. 66, W. Va.; CTY—Marion; RR—B. & O.
MS—Rush Miller........Everson, W.Va.
SM—H. F. Bennett, " "
S of H—Mules, rope and 1 Gasoline loco.; track gauge 42 in.
S of M—Hand.
PP—1 Armstrong, 1 Erie City return tubular boilers, total 225 H. P.
EMP—92. Coke ovens, 12 Bee Hive. Last fiscal year output 81,157 tons.

Consolidation No. 59 Mine; Drift; Pittsburgh Seam, 89 in. thick.
PO—Middleton, W. Va.; SP—Consolidation No. 59, W. Va.; CTY—Marion; RR—B. & O.
MS—Rush Miller......Middleton, W.Va.
SM—Lloyd Bennett, " "
S of H—Mules and 1 Elec. loco.; track gauge 42 in.
S of M—Hand.
PP—250 volts D. C. Power from Mine No. 47.
EMP—24. Last fiscal year output 36,900 tons.

Consolidation No. 36 Mine; Drift; Pittsburgh Seam, 81 to 98 in. thick.
PO—Middleton, W. Va.; SP—Consolidation No. 36, W. Va.; CTY—Marion; RR—B. & O.
MS—Rush Miller......Middleton, W.Va.
SM—Lloyd Bennett, " "
S of H—Mules and 1 Elec. loco.; track gauge 42 in.
S of M—Hand and 5 Elec. mach.
PP—1 150 K. W. Rotary 250 volts D. C., 6 phase, 60 cycles, 2 pumps. Power from Central station.
EMP—193. Last fiscal year output 175,759 tons.

Consolidation No. 47 Mine; Drift; Pittsburgh Seam, 74 to 98 in. thick.
PO—Middleton, W. Va.; SP—Consolidation No. 47, W. Va.; CTY—Marion; RR—B. & O.
MS—Rush Miller......Middleton, W.Va.
SM—Lloyd Bennett, " "
S of H—Mules and 1 Elec. loco.; track gauge 42 in.
S of M—Hand and 10 Elec. mach.
PP—2 Erie City return tubular boilers, total 200 H. P., 2 150 K. W. Rotary 250 volts D. C., 6 phase, 60 cycles, 1 pump. Power from Central station.
EMP—147. Last fiscal year output 257,094 tons.

Consolidation No. 28 Mine; Drift; Pittsburgh Seam, 91 to 98 in. thick.
PO—Middleton, W. Va.; SP—Consolidation No. 28, W. Va.; CTY—Marion; RR—B. & O.
MS—Rush Miller......Middleton, W.Va.
SM—Lloyd Bennett, " "
S of H—Mules, rope and 1 Elec. loco.; track gauge 42 in.
S of M—Hand and 4 Elec. mach.
MS—Rush Miller.....Middleton, W. Va.
PP—2 Erie City, 1 Wagner Palmros, return tubular boilers, total 280 H. P. 250 volts D. C., 2 pumps. Power from Mine No. 47.
Last fiscal year output 39,417 tons.

Consolidation No. 67 Mine; Slope; Pittsburgh Seam, 64 to 101 in. thick.
PO—Hutchinson. W. Va.; SP—Consolidation No. 67, W. Va.; CTY—Marion; RR—B. & O.
MS—K. D. Bailey....Hutchinson, W.Va.
SM—Homer Springston, " "
S of H—Mules and rope; track gauge 42 in.
S of M—Hand and Elec. mach.
PP—2 Penna. Boiler Works return tubular boilers, total 180 H. P. 250 volts D. C., 2 pumps. Power from Mine No. 84 and Central power plant.
Coke ovens, 50 Bee Hive.

Consolidation No. 84 Mine; Slope; Pittsburgh Seam, 84 to 90 in thick.
PO—Hutchinson, W. Va.; SP—Consolidation No. 67, W. Va.; CTY—Marion; RR—B. & O.
MS—K. D. Bailey....Hutchinson, W.Va.
SM—Homer Springston, " "
S of H—Mules and 3 elec. loco. Track gauge 42 in.
S of M—Hand and 10 elec. mach.
PP—2 Erie City return tubular boilers, total 200 H. P., 2 150 K. W. Rotary, 3 phase, 60 cycles, 250 volts D. C., 2 pumps. Power from Central power plant.
EMP—249. Last fiscal year output 265,724 tons.

Consolidation No. 49 Mine; Slope; Pittsburgh Seam, 65 to 103 in. thick.
PO—Enterprise, W. Va.; SP—Consolidation No. 49, W. Va.; CTY—Harrison; RR—B. & O.
MS—Rush Miller.......Enterprise, W.Va.
SM—Albert Hurst, " "
S of H—Mules, rope and 2 Elec. loco.
S of M—Hand and 9 Elec. mach.
PP—3 Erie City return tubular boilers, total 375 H. P., 250 volts D. C., 1 pump. Power from Mine No. 40.
EMP—134. Coke ovens, 60 Bee Hive.

Consolidation No. 40 Mine; Drift; Pittsburgh Seam, 89 to 102 in. thick.
PO—Viropa, W. Va.; SP—Consolidation No. 40, W. Va.; CTY—Harrison; RR—B. & O.
MS—E. B. Courtney......Viropa, W.Va.
SM—W. O. Bice. " "
S of H—Mules and 2 Elec. loco.; track gauge 42 in.
S of M—Hand and 9 Elec. mach.
PP—2 150 K. W. Roary, 3 phase, 60 cycles, 250 volts D. C. Power from Central power plant.
EMP—254. Last fiscal year output 198,805 tons.

Consolidation No. 32 Mine; Drift; Pittsburgh Seam, 78 to 101 in. thick.
PO—Shinnston, W. Va. SP—Consolidation No. 32, W. Va.; CTY—Harrison; RR—B. & O.
MS—C. H. Higinbotham,
Shinnston, W.Va.
SM—J. D. Warfield, " "
S of H—Mules and 3 elec. loco. Track gauge 42 in.
S of M—Hand and 10 elec. mach.
PP—2 Erie City return tubular boilers, total 200 H. P., 2 150 K. W. Rotaries, 3 phase, 60 cycles, 250 volts D. C., 2 pumps. Power from Central power plant.
EMP—281. Last fiscal year output 346,445 tons.

Consolidation No. 66 Mine; Drift; Pittsburgh Seam; 92 to 103 in. thick.
PO—Shinnston, W. Va.; SP—Consolidation No. 66, W. Va. CTY—Harrison; RR—B. & O.
MS—C. H. Higinbotham,
Shinnston, Wa.Va.
SM—W. R. Robey, " "
S of H—Mules and 1 Elec loco.; track gauge 42 in.
S of M—Hand and 6 Elec. mach.
PP—2 Erie City return tubular boilers, total 300 H. P., 1 100 K. W. 250 volts D. C.
EMP—153. Last fiscal year output 90,456 tons.

Consolidation No. 42 Mine; Drift; Pittsburgh Seam, 85 to 89 in. thick.
PO—Shinnston, W. Va.; SP—Consolidation No. 42, W. Va.; CTY—Harrison; RR—B. & O.
MS—J. H. Nuzum....Shinnston, W. Va.
SM—M. W. Hall, " "
S of H—Mules and 1 Elec. loco.; track gauge 42 in.
S of M—Hand and 5 Elec. mach.
PP—3 Erie City return tubular boilers, total 300 H. P., 1 150 K. W. Rotary, 6 phase, 60 cycles, 250 volts D. .C, 2 pumps.
Last fiscal year output 30,636 tons.

Consolidation No. 51 Mine; Drift; Pittsburgh Seam, 93 to 100 in. thick.
PO—Shinnston, W. Va.; SP—Consolidation No. 51, W. Va.; CTY—Harrison; RR—B. & O.
MS—J. H. Nuzum.....Shinnston, W.Va.
SM—M. W. Hall, " "
S of H—Mules, rope and 2 elec. loco. Track gauge 42 in.
S of M—Hand and 10 elec. mach.
PP—1 Hart Bros. and 1 Brownell return tubular boilers, total 120 H. P., 250 volts D. C., 1 pump. Power from Mine No. 65.
EMP—118. Last fiscal year output 170,776 tons.

Consolidation No. 65 Mine; Drift; Pittsburgh Seam, 93 to 112 in. thick.
PO—Shinnston, W. Va.; SP—Consolidation No. 65, W. Va.; CTY—Harrison; RR—B. & O.
MS—J. H. Nuzum......Shinnston, W.Va.
SM—M. W. Hall, " "
S of H—Mules, rope and 1 Elec. loco.; track gauge 43 in.
S of M—Hand and 5 Elec. mach.
PP—2 Jeffrey return tubular boilers, total 200 H. P., 1 150 K. W. Rotary, 3 phase, 60 cycles, 250 volts D. C., 2 pumps. Power from Cenral station.
Last fiscal year output 22,969 tons.

Consolidation No. 21 Mine; Drift; Pittsburgh Seam, 87 to 108 in. thick.
PO—Gypsy, W. Va.; SP—Consolidation No. 21, W. Va.; CTY—Harrison; RR—B. & O.
MS—D. A. Reed..........Gypsy, W.Va.
SM—B. L. Duty, " "
S of H—Mules, rope and 2 Elec. loco.; track gauge 48 in.
S of M—Hand and 11 Elec. mach.
PP—6 Erie City return tubular boilers, total 750 H. P., 2 150 K. W. generators, 250 volts D. C., 2 pumps.
EMP—226. Coke ovens, 80 Bee Hive Last fiscal year output 220,941 tons.

Consolidation No. 55 Mine; Drift; Pittsburgh Seam, 96 to 101 in. thick.
PO—Meadowbrook, W. Va.; SP—Consolidation No. 55, W. Va.; CTY—Harrison; RR—B. & O.
MS—Thos. Jarrett, Jr.,
Meadowbrook, W.Va.
SM—J. Carl Hustead, " "
S of H—Mules and 1 Elec. loco.
S of M—Hand and 4 Elec. mach.
PP—2 Erie City return tubular boilers, total 300 H. P. ,1 100 K. W. generator, 250 volts D. C.
EMP—144. Coke ovens, 50 Bee Hive. Last fiscal year output 87,473 tons.

Consolidation No. 33 Mine; Drift; Pittsburgh Seam, 93 to 102 in. thick.
PO—Glen Falls, W. Va.; SP—Consolidation No. 33, W. Va.; CTY—Harrison; RR—B. & O.
MS—A. C. Ice......Glenn Falls, W.Va.
SM—J. T. Curry, " "
S of H—Mules, gravity, and 1 Elec. loco.; track gauge 42 in.
S of M—Hand and 3 Elec. mach.
PP—250 volts D. C., 3 pumps. Power from Mine No. 27.
Coke ovens, 22 Bee Hive. Last fiscal year output 12,188 tons.

Consolidation No. 27 Mine; Drift; Pittsburgh Seam, 87 to 103 in. thick.
PO—Glen Falls, W. Va.; SP—Consolidation No. 27, W. Va.; CTY—Harrison; RR—B. & O.
MS—A. C. Ice........Glen Falls, W.Va.
SM—J. T. Curry, " "
S of H—Mules and 1 Elec. loco.; track gauge 42 in.
S of M—Hand and 4 Elec. mach.
PP—2 150 K. W. Rotaries, 6 phase, 60 cycles, 250 volts D. C. Power from Central station.
EMP—70. Last fiscal year output 65. 165 tons.

Consolidation No. 48 Mine; Drift; Pittsburgh Seam, 88 to 100 in. thick.
PO—Glen Falls, W. Va.; SP—Consolidaion No. 48, W. Va.; CTY—Harrison; RR—B. & O.
MS—A. C. Ice.......Glen Falls, W.Va.
SM—J. T. Curry, " "
S of H—Mules and 1 Elec. loco.; track gauge 44 in.
S of M—Hand and 4 Elec. mach.
PP—250 volts D. C. Power from Mine No. 27.
EMP—83. Last fiscal year output 75,778 tons.

Consolidation No. 35 Mine; Drift; Pittsburgh Seam, 76 to 98 in. thick.
PO—Box 616, Clarksburg, W. Va.; SP—Consolidation No. 35, W. Va.; CTY—Harrison; RR—B. & O.
MS—Luke Murray,
Box 616, Clarksburg, W.Va.
SM—H. M. Rogers,
Box 616, Clarksburg, W.Va.
S of H—Mules and 1 Elec. loco.
S of M—Hand and 5 Elec. mach.
PP—1 150 K. W. Rotary, 250 volts D. C., 6 prase, 60 cycles, 3 pumps. Power from Central station.
Last fiscal year output 18,425 tons.

Consolidation No. 25 Mine; Slope; Pittsburgh Seam; 81 to 120 in. thick.
PO—Box 616, Clarksburg, W. Va.; SP—Consolidation No. 25, .W. Va.; CTY—Harrison; RR—B. & O.
MS—Luke Murray,
Box 616, Clarksburg, W.Va.
SM—H. M. Rogers,
Box 616, Clarksburg, W.Va.
S of H—3 elec. locos. Track gauge 36 in.
S of M—11 elec. mach.
PP—2 Hart, 1 Jeffrey, and 1 Erie City return tubular boilers, total 475 H. P., 250 volts D. C., 4 pumps. Power from Mine No. 27 and Central station.
EMP—280. Last fiscal year output 250,623 tons.

Consolidation No. 58 Mine; Drift; Pittsburgh Seam, 76 to 105 in. thick.
PO—R. F. D. No. 3, Clarksburg, W. Va.; SP—Consolidation No. 58, W. Va.;
SM—L. B. Nixon,
R. F. D. No. 3,Clarksburg, W.Va.
MS—Luke Murray,
R. F. D. No. 3, Clarksburg, W. Va.
S of H—Mules and 1 Elec. loco.; track gauge 42 in.
S of M—Hand and 3 Elec. mach.
PP—250 volts D. C. Power from Mine No. 29.
Last fiscal year output 15,923 tons.

Consolidation No. 29 Mine; Drift; Pittsburgh Seam, 91 to 104 in. thick.
PO—R. F. D. No. 3, Clarksburg, W. Va.; SP—Consolidation No. 29, W. Va.; CTY—Harrison; RR—B. & O.
MS—Luke Murray,
R. F. D. No. 3, Clarksburg, W.Va.
SM—L. B. Nixon,
R. F. D. No. 3, Clarksburg, W.Va.
S of H—Elec. loco.; track gauge 42 in.
S of M—Hand and 5 Elec. mach.

(Continued on Next Page)

Consolidation Coal Co. (The)—Cont.
PP—2 Erie City, 1 Morton & Reed return tubular boilers, total 330 H. P., 1 150 K. W. Rotary, 6 phase, 60 cycles, 250 volts D. C., 2 pumps. Power from Central station for rotary.
EMP—145. Last fiscal year output 130,691 tons.

Consolidation No. 52 Mine; Drift; Pittsburgh Seam, 87 to 98 in. thick.
PO—R. F. D. No. 3, Clarksburg, W. Va.; SP—Consolidation No. 52, W. Va.; CTY—Harrison; RR—B. & O.
MS—Luke Murray,
R. F. D. No. 3, Clarksburg, W.Va.
SM—L. B. Nixon,
R. F. D. No. 3, Clarksburg, W.Va.
S of H—Mules and rope; track gauge 42 in.
S of M—Hand and 8 Comp. air mach.
PP—2 Erie City, and 1 Acme return tubular boilers, total 325 H. P., 1 compressor, and 1 pump.
Last fiscal year output 32,527 tons.

Consolidation No. 39 Mine; Drift; Pittsburgh Seam, 74 to 96 in. thick.
PO—Lewis, W. Va.; SP—Consolidation No. 39, W. Va.; CTY—Harrison; RR—B. & O.
MS—P. B. Robinson......Lewis, W.Va.
SM—C. Mason Linger, " "
S of H—Mules and 1 Elec. loco.; track gauge 42 in.
S of M—Hand and 4 Elec. mach.
PP—1 Erie City and 1 Berger Bros. return tubular boilers, total 275 H. P., 1 150 K. W. generator, 250 volts D. C., 1 pump.
EMP—89. Last fiscal year output 50,155 tons.

Consolidation No. 60 Mine; Drift; Pittsburgh Seam, 64 to 72 in. thick.
PO—Lewis, W. Va.; SP—Consolidation No. 60, W. Va.; CTY—Harrison; RR—B. & O.
MS—P. B. Robinson......Lewis, W.Va.
SM—C. Mason Linger, " "
S of H—Mules and gravity; track gauge 42 in.
S of M—Hand and 2 Elec. mach.
PP—250 volts D. C., 1 pump. Power from Hutchinson Coal Co., Byron Mine.
Last fiscal year output 8,437 tons.

Consolidation No. 44 Mine; Drift; Pittsburgh Seam, 49 to 87 in. thick.
PO—Lewis, W. Va.; SP—Consolidation No. 44, W. Va.; CTY—Harrison; RR—B. & O.
MS—P. B. Robinson......Lewis, W.Va.
SM—C. Mason Linger, " "
S of H—Mules and Gravity; track gauge 42 in.
S of M—Hand and 2 Elec. mach.
PP—1 Erie City return tubular boiler(150 H. P., 1 pump, 1 75 K. W. generator, 250 volts D. C.
Last fiscal year output 12,826 tons.

Consolidation No. 64 Mine; Drift; Pittsburgh Seam, 78 to 97 in. thick.
PO—Lewis, W. Va.; SP—Consolidation No. 64, W. Va.; CTY—Harrison; RR—B. & O.
MS—P. B. Robinson.......Lewis, W.Va.
SM—C. Mason Linger, " "
S of H—Mules; track gauge 42 in.
S of M—Hand and 4 Comp. air mach.
PP—2 Erie City return tubular boilers, total 300 H. P., 1 compressor, 1 pump.
Last fiscal year output 17,867 tons.

Consolidation No. 37 Mine; Drift; Pittsburgh Seam, 84 to 102 in. thick.
PO—Berryburg, W. Va.; SP—Consolidation No. 37, W. Va.; CTY—Barbour; RR—B. & O.
MS—W. W. Ferguson...Berryburg, W.Va.
SM—W. F. Reger, " "
S of H—Mules and 4 Elec. loco.; track gauge 42 in.
S of M—Hand and 12 Elec mach.
PP—2 Erie City, 5 Bodger Bros. return tubular boilers, total 1050 H. P., 3 100 K. W. generators, 250 volts D. C.
EMP—114. Last fiscal year output 200,437 tons.

Consolidation No. 50 Mine; Drift; Pittsburgh Seam, 75 to 100 in. thick.
PO—Adamston, W. Va.; SP—Consolidation No. 50, W. Va.; CTY—Harrison; RR—B. & O.
MS—A. A. Evans......Adamston, W.Va.
S of H—Mules and 2 Elec. loco.; track gauge 44 in.
S of M—Hand and 6 Elec. mach.
PP—3 Erie City return tubular boilers, total 450 H. P., 2 100 K. W. generators, 250 volts D. C., 2 pumps.
Last fiscal year output 28,852 tons.

Consolidation No. 62 Mine; Drift; Pittsburgh Seam, 84 to 88 in. thick.
PO—Adamston, W. Va.; SP—Consolidation No. 62, W. Va.; CTY—Harrison; RR—B. & O.
MS—A. A. Evans......Adamston, W.Va.
S of H—Mules and gravity; track gauge 44 in.
S of M—Hand and 4 Elec. mach.
PP—250 volts D. C. Power from Mine No. 50.
EMP—58. Last fiscal year output 55,296 tons.

Consolidation No. 54 Mine; Drift; Pittsburgh Seam 74 to 96 in. thick.
PO—Haywood, W. Va.; SP—Consolidation No. 54, W. Va.; CTY—Harrison; RR—B. & O.
MS—Lowell Childs......Haywood, W.Va.
SM—A. T. Wood...Lumberport, W. Va.
S of H—Mules and rope; track gauge 44 in.
S of M—Hand and 7 Elec. machs.
PP—2 Union Iron Works return tubular boilers, total 250 H. P., 1 100 K. W. generator, 250 volts D. C.
EMP—86. Last fiscal year output 85,594 tons.

Consolidation No. 23 Mine; Drift; Pittsburgh Seam, 96 in. thick.
PO—Haywood, W. Va.; SP—Consolidation No. 23, W. Va.; CTY—Harrison; RR—B. & O.
MS—Lowell Childs......Haywood, W.Va.
SM—Alf Duty......Lumberport, W. Va.
S of H—Mules; track gauge 44 in.
S of M—Hand and 4 Elec. mach.
PP—250 volts D. C. Power from Mine No. 54.
Last fiscal year output 10,437 tons.

Consolidation No. 86 Mine; Shaft; Pittsburgh Seam; 96 in. thick.
PO—Farmington, W. Va., R. F. D. No. 1; SP—Consolidation No. 86 W. Va.; CTY—Marion; RR—W. Md.
MS—W. J. Wolf,
R. F. D. No. 1, Farmington, W. Va.
SM—H. R. Sayre,
R. F. D. No. 1, Farmington, W. Va.
S of H—Elec. and storage battery motors. Track gauge 42 in.
S of M—Hand and elec. mach.
PP—3 Erie City return tubular boilers, total 300 H. P., 1—150 K. W. Rotary, 3 phase, 60 cycles, 250 volts D. C. Power from Central power plant.
Note—New operation.

Consolidation No. 87 Mine; Shaft; Pittsburgh Seam; 84 in. thick.
PO—R. F. D. No. 1, Farmington, W. Va.; SP—Consolidation No. 87, W. Va.; CTY—Marion; RR—W. Md.
MS—W. J. Wolf,
R. F. D. No. 1, Farmington, W. Va.
SM—C. W. Meredith,
R. F. D. No. 1, Farmington, W. Va.
S of H—Elec. and storage battery motors. Track gauge 42 in.
S of M—Hand and elec. mach.
PP—3 Erie City return tubular boilers, total 300 H. P., 1—150 K. W. rotary, 3 phase, 60 cycles, 250 volts D. C. Power from C,entral power plant.
Note—New operation.

CONSUMERS COAL & MINING CO.
"Camden" Mine, Drift, Pittsburgh No. 8 Seam, 4 ft. thick.
PO—Spilman, W.Va., SP—Same, CTY—Mason. RR—B.& O.
PR—B. D. Spilman..Warrenton, Va.
GM—M. G. Tyler.......Spilman, W.Va.
PA—M. G. Tyler, " "
GS—M. G. Tyler, " "
EM—M. G. Tyler, " "
EE—Pat Riley, " "
SCO—Consumers Coal & Mining Co.
SM—Frank Roush....Spilman, W.Va.
S of H—1 Elec. loco., track gauge 39 in.
S of M—5 Elec. machines.
PP—2 Erie reurn tubular boilers, total 300 H. P., 2 pumps.
EMP—50. Last fiscal year output 300 tons.
(Old information.)

COOPER, J. CALVIN,
Cooper Mine; Drift; Kittanning Seam; 66 to 78 in. thick.
PO—Davis, W. Va.; SP—Same; CTY—Tucker; RR—W. Md.
MS—J. Calvin Cooper...Davis, W. Va.
S of H—Mules. Track gauge 36 in.
S of M—Hand.
PP—2 Gasoline engines, 1 pump.
EMP—9. Last fiscal year output 11,249 tons.

COPEN CREEK COAL CO. (THE)
General Office, 233 Arcade, Cleveland, O.
Vanwith Mine; Drift; Pgh. No. 8 Seam, 72 to 120 in. thick.
PO—Bower, W. Va.; SP—Same; CTY—Braxon; RR—C. & C.
PR—George E. Meier....Cleveland, O.
GM—Robert Bursner, " "
PA—Robert Bursner, " "
GS—A. J. Salzer........Bower, W.Va.
EE—A. J. Salzer, " "
EM—J. G. Alstetter..Clarksburg, W. Va.
CE—J. G. Alstetter, " "
SM—R. A. Darnall.....Gilmer, W. Va.
SCO—S. A. Bruno & Co., Bower, W. Va.
MS—H. H. Pierce, " "
S of H—1 Elec. loco. and mules; track gauge 36 in.
S of M—3 Elec. mach. and hand.
PP—2 Erie City return tubular boilers, total 450 H. P., 1 gen. unit, 250 volts D. C.
EMP—95. Last fiscal year output 122,000 tons.
Sales Agent, Robt. Bursner, Cleveland, O.

CORA COAL & COKE CO.
Cora Mine, Drift, Seam 7 ft. thick.
PO—Cora, W. Va., SP—Same, CTY—Logan. RR—C. & O.
PR—C. W. Jones..........Cora, W.Va.
GM—C.W.Jones,.........Cora, W.Va.
GS—C.W.Jones, " "
PA—C.W.Jones, " "
TR—A. H. Land....Barboursville, W.Va.
CE—Beddow & McCorkle, Logan, W.Va.
EM—Beddow & McCorkle, "
EE—Frank Cooper.......Cora, W. Va.
MS—R. G. Clayton, " "
SCO—Cora Coal &Coke Co., Buyer, P. H. Akers, Cora, W. Va.
S of H—4 Elec. loco.
S of M—4 Elec. machines.
PP—Purchase power.
EMP—About 100.
Sales agents, Producers Coal Co., Cincinnati Ohio.

CRAWFORD, H. M. & COMPANY
Empire Mine; Drift; Freeport Seam; 72 to 96 in. thick.
PO—Philippi, W. Va.; SP—Clements; CTY—Barbour; RR—B. & O.
PR—H. M. Crawford...Philippi, W. Va.
GM—H. M. Crawford " "
PA—H. M. Crawford " "
MS—Edward Shaffer " "
S of H—Mules.
EMP—20.
Mine opened December, 1915.

CROWN COAL & COKE CO.
Drift Mine, Island Creek Seam, 60 in. thick.
PO—Crown, W. Va.; SP—Lax, W. Va.; CTY—Logan; RR—C. & O.
PR—J. W. Lax........Crown, W. Va.
TR—J. W. Lax, " "
GM—J. W. Lax, " "
PA—J. W. Lax, " "
EM—H. C. Dawson, " "
SCO—Address the Company " "
S of H—3 elec. loco. Track gauge 44 in.
S of M—3 Elec. mach.
PP—Boiler 150 H. P., gen. units 250 volts D. C.
EMP—80. Last fiscal year output 85,000 tons.

CROZER COAL & COKE CO.
General Office, North American Bldg., Philadelphia Pa.
Nos. 1 and 2 Mines; Drift; No. 3, Pocahontas Seam, 90 to 114 in. thick.
PO—Elkhorn, W. Va., SP—Same, CTY—McDowell; RR—N. & W., Main Line.
PR—John P. Crozer, Philadelphia, Pa.
TR—Louis R. Page, " "
TR Asst—L. Rodman Page, Jr.,
Philadelphia, Pa.
Secy—Edward C. Page....Elkhorn, W.Va.
GM—John J. Lincoln, Elkhorn, W.Va.
PA—J. H. Newton , " "
Asst GM—H. D. Smith, " "
MS—H. D. Smith, " "
EM—R. A. Ruff, " "
EE—Allen Raup, " "
SCO—Address the Company. Buyer, D. R. Whittaker, Elkhorn, W. Va.
S of H—5 Elec. loco. and mules; track gauge 44 in.
S of M—3 elec. mach. and hand.
PP—6 Return tubular boilers, total 900 H. P., 3 gen. units 500 volts D. C., 3 pumps delivering water to surface.
EMP—450. Coke ovens, 200 Bee Hive. Last fiscal year output 292,730 tons coal; 32881 tons coke.
Sales Agency, Crozer—Pocahontas Co., North American Bldg., Phila., Pa.

CRYSTAL BLOCK COAL & COKE CO.
General Office, Welch, W. Va.
PR—L. E. Woods.......Welch, W. Va.
TR—W. J. O'Toole, " "
PA—W. J. O'Toole, " "
EM—H. W. Saunders, " "
CE—H. W. Saunders, " "
GM—C. M. Gates.......Sprigg, W. Va.
EE—W. O. Hay, " "
MM—M. V. Crigger......Rawl, W.Va.
SCO—Crystal Supply Co., " "
Buyer, S. T. Bousman, Rawl, W. Va.
Sales Agency, Glen Alum Fuel Co., Cincinnati, O.

No. 1 Works; Drift, Wini and Coalburg Seam, 48 to 72 in. thick.
PO—Rawl, W. Va.; SP—Same; CTY—Mingo; RR—N. & W.
MS—M. V. Crigger......Rawl, W.Va.
S of H—2 Elec., 1 steam loco. and mules; track gauge 48 in.
S of M—4 Elec. mach.
PP—Power purchased.
EMP—150. Output 800 tons daily.

No. 2 Works; Drift, Wini and Coalburg Seams 48 to 52 in. thick.
PO—Sprigg, W. Va.; SP—Same; CTY—Mingo; RR—N. & W., Alma Spur.
MS—E. H. Gates........Sprigg, W.Va.
S of H—3 Elec. loco.; track gauge 48 in.
S of M—4 Elec. mach.
PP—Power purchased.
EMP—125. New plant.

CRYSTAL COAL & COKE CO.
General Office, Bramwell, W. Va.
Crystal Mine; Drift; Pocahontas No. 3 Seam; 4½ ft. thick; washery.
PO—Crystal, W. Va.; SP—Mora, W. Va.; CTY—Mercer. RR—N.& W.
PR—W. H. Thomas, Bramwell, W. Va.
TR—W. H. Thomas, Bramwell, W.Va.
GM—W. J. Pritchard, " "
GS—W. J. Pritchard, " "
SM—N. T. Roberts......Crystal, W.Va.
PA—N. T. Roberts, " "
MS—Eugene Powell, " "
EM—Eugene Powell, " "
MM—Owen Sizemore, " "
S of H—5 elec. locos. and mules; track gauge 48 in.
S of M—Hand.
PP—4 Return tubular boilers total 300 H.P., 2 gen. units, 220 volts A. C., 3 phases, and 60 cycles, 2 pumps delivering water to surface, power purchased.
EMP—325. Coke ovens, 150 bee hive. Last fiscal year output 220,000 tons.
Sales Agency, Flat Top Fuel Co., Bluefield, W. Va.

CUB FORK COAL CO.
Cub Fork Mine; Drift, Winifrede Seam, 84 in. thick.
PO—Yolyn, W. Va.; SP—Same; CTY—Logan; RR—C. & O., Run Creek Br.
PR—W. E. Deegans....Mt. Hope, W.Va.
GM—W. E. Deegans, " "
TR—E. C. James........Yolyn, W.Va.
CE—W. G. Wilkins Co., Pittsburgh, Pa., and Huntington, W. Va.
S of H—2 Elec. loco.; track gauge 44 in.
S of M—Elec. mach.
PP—Power purchased.
EMP—125.

CUMBERLAND CANNEL COAL CO.
1 Mine in W. Va., 1 Mine in Kentucky;
Gem Pocahontas Mine; Davy Seam, 30 to 40 in. thick.
PO—Lex, W. Va.; SP—Robley, W. Va.; RR—N. & W. Dry Fork, Branch.
PR—James P. Flanagan....Lex, W.Va.
TR—J. H. Hanchey.......Lex, W. Va.
GM—James P. Flanagan, " "
GS—J. B. Miller, " "
PA—J. B. Miller, " "
MS—J. B. Miller, " "
EM—G. J. Cooper, " "
SCO—Emons Hawkins Store. Buyer, J. B. Miller, Lex, W. Va.
S of H—Mules and 1 gasoline loco. Track gage 36 in.
S of M Hand.
EMP—30.
Loading 150 tons per day.
Sales agent, J. H. Hanchey, Lex, W. Va.

CUMBERLAND COAL CO.
General Office, Baltimore, Md.
Douglas Mine, Drift, Lower Kittanning Seam, 4 to 8 ft. thick.
PO—Albert, W. Va., SP—Douglas, W. Va., CTY—Tucker. RR—West Va. Div. Western Maryland.
PR—Wm. H. Gorman..Baltimore, Md.
TR—J W. McMillan, " "
GM—Douglas Gorman, " "
PA—R. G. Broome, " "
GS—Jas. J. Dobbie,..Albert, W.Va.
EM—J. A. Smith, " "
MM—Harry Lipscomb, " "
EE—G. S. Westfield. " "
SCO—The Douglas Co., Buyer, W. M. Faw, Albert, W. Va.
S of H—Horses, 3 Steam loco., and 3 elec. loco., track gauge 40 in.
S of M—Hand, and 5 comp. air mach.
PP—3 Return tubular boilers. total 450 H. P., 1 gen. unit 550 volts D. C., 1 air comp. and 5 pumps.
EMP—300. Last fiscal year output 177,642 tons. Coke ovens, 125 Bee Hive.

CUTLIP SIDING COAL COMPANY
Cutlip Mine; Drift; Pittsburgh No. 8 Seam; 72 to 84 in. thick.
PO—Braxton, W. Va.; SP—Cutlip Siding, W. Va.; CTY—Braxton; RR—Coal & Coke.
PR—W. A. Simmons....Braxton, W. Va.
GM—W. A. Simmons, " "
PA—W. A. Simmons, " "
GS—F. M. Murphy, " "
MS—F. M. Murphy, " "
SM—W. A. & L. C. Simmons,
Braxton, W. Va.
S of H—Mules.
EMP—18.

DAKOTA COAL & COKE CO.
PR—R. A. Dornon, New Alexandria, Pa.
TR—Doty Guthrie, " "
GM—E. B. Rowe....Fairmont, W. Va.
GS—E. B. Rowe, " "
PA—E. B. Rowe, " "
CE—E. B. Rowe, " "
EM—J. A. Alstetter, Clarksburg, W. Va.
MM—T. S. Hardesty..Fairmont, W. Va.
SCO—Dakota Store Co., Buyer, E. B. Rowe, Fairmont, W. Va.

Dakota Nos. 1 and 2 Mines; Shaft; Pittsburgh Seam; 7 ft. 5 in. to 8 ft. 2 in. thick.
PO—Fairmont, W. Va., SP—Sparling Siding, W. Va., CTY—Marion. RR—B. & O., Paw Paw Branch.
MS—W. H. Myers..Fairmont, W. Va.
S of H—Mules, rope, 2 comp. air loco., track gauge 42 inches.
S of M—Pick, and 14 compressed air machines.
PP—4 return tubular boilers, 2 Erie and 2 Keeler. Total 600 H. P., 2 air comp. and 1 pump.
EMP—175

DAVIS COAL & COKE COMPANY
General Office, Baltimore, Md. ...
PR—A. W. Calloway....Baltimore, Md.
TR—L. F. Zimmerman, " "
GS—R. P. Maloney....Thomas, W. Va.
PA—Address M. D. Kirk, Cumberland, Md. Assistant to President.

L. Potomac No. 51 Mine; Drift; Bakertown Seam; 26 to 32 in. thick.
PO—Beryl, W. Va.; SP—Central Junction, W. Va.; CTY—Mineral; RR—Western Maryland.
MS—B. W. McClure.....Beryl, W. Va.
S of H—Mules and 2 elec. locos. Track gauge 42 in.
PP—1 Monroe return tubular boiler, total 80 H. P.
EMP—92. Last fiscal year output, 71,665 tons.

Coketon No. 35 Mine; Drift; Lower Kittanning Seam; 54 to 66 in. thick.
PO—Coketon, W. Va.; SP—Thomas, W. Va.; CTY—Tucker; RR—Western Maryland.
MS—A. Beveridge.....Coketon, W. Va.
S of H—Mules and 1 elec. loco. Track gauge 42 in.
PP—Receive power from Central Station.
EMP—24. Last fiscal year output 13,152 tons.

Elk Garden No. 20 Mine; Drift; Upper Freeport Seam; 42 to 54 in. thick.
PO—Elk Garden, W. Va.; SP—Ott, W. Va.; CTY—Mineral; RR—Western Maryland.
MS—J. E. Ott.....Elk Garden, W. Va.
S of H—Mules and 1 gasoline loco. Track gauge 42 in.
PP—2 Milholland return tubular boilers, total 150 H. P.
EMP—79. Last fiscal year output 29,929 tons.

Lower Potomac No. 19 Mine; Drift; Kittanning Seam; 42 to 54 in. thick.
PO—Beryl, W. Va.; SP—Central Junction, W. Va.; CTY—Mineral; RR—Western Maryland.
MS—B. W. McClure.....Beryl, W. Va.
S of H—Mules, rope and 1 elec. loco. Track gauge 42 in.
PP—1 Ames and 2 Atlas return tubular boilers, total 350 H. P., 1 gen. unit, 550 volts D. C., 150 K. W.
EMP—108. Last fiscal year output 78,374 tons.

Lower Potomac No. 50 Mine; Drift; Bakertown Seam; 20 to 32 in. thick.
PO—Beryl, W. Va.; SP—Central Junction, W. Va.; CTY—Mineral; RR—Western Maryland.
MS—B. W. McClure.....Beryl, W. Va.
S of H—Mules. Track gauge 42 in.
PP—1 Monroe return tubular boiler, total 80 H. P.
EMP—59. Last fiscal year output, 39,650 tons.

Lower Potomac No. 52 Mine; Drift; Bakertown Seam; 26 to 32 in. thick.
PO—Beryl, W. Va.; SP—Central Junction, W. Va.; CTY—Mineral; RR—Western Maryland.
MS—B. W. McClure.....Beryl, W. Va.
S of H—2 elec. locos. Track gauge 42

PP—2 Phoenix return tubular boilers, total 300 H. P., 1 gen. unit, 550 volts D. C., 250 K. W., 1 pump.
EMP—32. Last fiscal year output 12,570 tons.
NOTE—This mine is located in Garrett Co., Md.

Coketon No. 41 Mine; Slope; Kittanning Seam; 36 to 42 in. thick.
PO—Coketon, W. Va.; SP—Thomas, W. Va.; CTY—Tucker; RR—Western Maryland, Davis branch.
MS—A. Beveridge......Coketon, W. Va.
S of H—Mules and 1 elec. loco. Track gauge 42 in.
PP—Three 25 K. W. Transformers, 600 volts D. C. & A. C., 3 phases, 60 cycles. Receive power from central station.
EMP—44. Last fiscal year output 41,207 tons.

Coketon No. 24 Mine; Drift; Upper Freeport Seam; 48 to 60 in. thick.
PO—Coketon; SP—Thomas, W. Va.; CTY—Tucker; RR—Western Maryland, Davis branch.
MS—A. Beveridge......Coketon, W. Va.
S of H—Mules and 1 elec. loco. Track gauge 42 in.
PP—Receive power from central station.
EMP—49. Last fiscal year output, 60,878 tons.

Benbush No. 26 Mine; Drift; Upper Freeport; 48 to 54 in. thick.
PO—Benbush, W. Va.; SP—Same; CTY—Tucker; RR—Western Maryland, Benbush branch.
MS—R. N. Hosler.....Benbush, W. Va.
S of H—Mules. Track gauge 42 in.
PP—Receive power from central station.
EMP—66. Last fiscal year output 54,482 tons.

Benbush No. 28 Mine; Drift; Upper Freeport Seam; 48 to 54 in. thick.
PO—Benbush, W. Va.; SP—Same; CTY—Tucker; RR—Western Maryland, Benbush branch.
MS—R. N. Hosler.....Benbush, W. Va.
S of H—Mules. Track gauge 42 in.
PP—Receive power from central station.
EMP—24. Last fiscal year output, 12,373 tons.

Pierce No. 43 Mine; Slope; Kittanning Seam; 54 to 66 in. thick.
PO—Pierce, W. Va.; SP—Same; CTY—Tucker; RR—Western Maryland, Pierce branch.
MS—M. W. Brewer.....Pierce, W. Va.
S of H—Rope and 3 elec. locos. Track gauge 42 in.
PP—One 300 K. W. Syn. Converter, three 150 K. W. Transformers, 600 volts D. C. & A. C., 3 phase, 60 cycles, 1 pump. Receive power from central station.
EMP—60. Last fiscal year output 50,245 tons.

Kempton No. 42 Mine; Shaft; Kittanning Seam; 54 to 62 in. thick.
PO—Kempton, W. Va.; SP—Same; CTY—Preston; RR—Western Maryland, Kempton branch.
MS—George Roberts....Kempton, W. Va.
S of H—6 elec. locos. Track gauge 42 in.
S of M—2 elec mach.
PP—Two 300 Syn. Conv., three 200 K. W. Transformers, 600 volts D. C. & A. C., 3 phases, 60 cycles, 3 pumps. Receive power from central station.
EMP—112. Last fiscal year output 128,924 tons.

Coketon No. 36 Mine; Drift; Kittanning Seam; 36 to 54 in. thick
PO—Coketon, W. Va.; SP—Thomas, W. Va.; CTY—Tucker; RR—Western Maryland.
MS—A. Beveridge......Coketon, W. Va.
S of H—Mules and 6 elec. locos. Track gauge 42 in.
PP—(Central Station)—Two 300 K. W. Syn. Converters, three 100 K. W. Transformers, 600 volts D. C. & A. C., 3 phases, 60 cycles, 1 pump.
EMP—141. Last fiscal year output 146,228 tons.

Coketon No. 37 Mine; Drift; Kittanning Seam; 48 to 60 in. thick.
PO—Coketon, W. Va.; SP—Thomas, W. Va.; CTY—Tucker, RR—Western Maryland.
MS—A. Beveridge......Coketon, W. Va.
S of H—6 elec locos. Track gauge 42 in.
PP—1 pump. Receive power from central station.
EMP—123. Last fiscal year output 148,561 tons.

Benbush No. 38 Mine; Shaft; Kittanning Seam; 54 to 66 in. thick.
PO—Benbush, W. Va.; SP—Same; CTY—Tucker; RR—Western Maryland, Benbush branch.
MS—R. N. Hosler.....Benbush, W. Va.
S of H—Mules and 8 elec. locos. Track gauge 42 in.
PP—2 return tubular boilers, total 300 H. P., two 300 K. W. Syn. Converters, three 50 K. W. Transformers, 600 volts D. C. & A. C., 3 phase, 60 cycles, 1 steam and 2 elec. pumps. Receive power from central station.
EMP—210. Last fiscal year output 216,606 tons.

Pierce No. 39 Mine; Shaft; Kittanning Seam; 54 to 66 in. thick.
PO—Pierce; SP—Same; CTY—Tucker; RR—Western Maryland, Pierce branch.
MS—W. W. Brewer......Pierce, W. Va.
S of H—Mules and 6 elec. locos. Track gauge 42 in.
PP—2 Atlas return tubular boilers, total 250 H. P., one 300 K. W. Converter, three 150 K. W. Transformers, 600 volts D. C. & A. C., 3 phases, 60 cycles, 1 elec. and 2 steam pumps. Receive power from central station.
EMP—174. Last fiscal year output 204,532 tons.

Pierce No. 40 Mine; Shaft; Kittanning Seam; 54 to 66 in. thick.
PO—Pierce, W. Va.; SP—Same; CTY—Tucker; RR—Western Maryland, Pierce branch.
MS—W. W. Brewer......Pierce, W. Va.
S of H—Mules and 5 elec. locos. Track gauge 42 in.
PP—2 Erie return tubular boilers, total 250 H. P., two 300 K. W. Syn. Converters, three 65 K. W. Transformers, 600 volts D. C. & A. C., 3 phases, 60 cycles, 1 elec. and 2 steam pumps. Receive power from central station.
EMP—176. Last fiscal year output 209,293 tons.

Henry No. 22 Mine; Shaft; Upper Freeport Seam; 36 to 54 in. thick.
PO—Henry, W. Va.; SP—Same; CTY—Grant; RR—Western Maryland.
MS—Wm. Beveridge.....Henry, W. Va.
S of H—Mules and 5 elec. locos. Track gauge 42 in.
S of M—4 elec. mach.
PP—4 Phoenix return tubular boilers, total 600 H. P., two 300 K. W. Syn. Converters, three 50 K. W. Transformers, 600 volts D. C. & A. C., 3 phases, 60 cycles, 2 pumps. Receive power from central station.
EMP—143. Last fiscal year output 149,624 tons.

Thomas No. 25 Mine; Drift; Upper Freeport Seam; 48 to 60 in. thick.
PO—Thomas, W. Va.; SP—Same; CTY—Tucker; RR—Western Maryland.
MS—M. Blair........Thomas, W. Va.
S of H—Mules and 2 elec. locos. Track gauge 42 in.
PP—3 pumps, 600 volts D. C. & A. C., 3 phases, 60 cycles. Receive power from central station.
EMP—57. Last fiscal year output 44,915 tons.

Thomas No. 23 Mine; Drift; Upper Freeport Seam; 48 to 60 in. thick.
PO—Thomas, W. Va.; SP—Same; CTY—Tucker; RR—Western Maryland.
MS—M. Blair........Thomas, W. Va.
S of H—Mules and 6 elec. locos. Track gauge 42 in.
PP—5 pumps, six 50 K. W. Transformers, 600 volts D. C. & A. C., 3 phases, 60 cycles. Receive power from central station.
EMP—167. Last fiscal year output 184,429 tons.

Thomas No. 34 Mine; Shaft; Kittanning Seam; 42 to 54 in. thick.
PO—Thomas, W. Va.; SP—Same; CTY—Tucker; RR—Western Maryland.
MS—M. Blair........Thomas, W. Va.
S of H—Mules and 3 elec. locos. Track gauge 42 in.
PP—6 pumps, 600 volts D. C. & A. C., 3 phase, 60 cycles. Receive power from central station.
EMP—80. Last fiscal year output 75,775 tons.

Elk Garden No. 14 Mine; Drift; Upper Kittanning Seam; 36 to 48 in. thick.
PO—Elk Garden, W. Va.; SP—Kittanning, W. Va.; CTY—Mineral; RR—Western Maryland; Elk Garden Br.
MS—J. E. Ott.....Elk Garden, W. Va.
S of H—Mules. Track gauge 42 in.
PP—3 Erie return tubular boilers, total 180 H. P.
EMP—101. Last fiscal year output 84,203 tons.

No 5 Mine; Drift; Kittanning Seam; 60 to 66 in. thick.
PO—Weaver, W. Va.; SP—Same; CTY—Randolph RR—Western Maryland, Weaver Branch.
MS—H. H. Harrison....Weaver, W. Va.
S of H—Mules. Track gauge 42 in.
EMP—17. Last fiscal year output, 979 tons.

Weaver No. 1 Mine; Drift; Lower Kittanning Seam; 60 to 72 in. thick.
PO—Weaver, W. Va.; SP—Same; CTY—Randolph; RR—Western Maryland, Weaver Branch.
MS—H. H. Harrison....Weaver, W. Va.
S of H—Mules. Track gauge 42 in.
PP—3 Kendall & Roberts boilers, total 275 H. P.
EMP—39. Last fiscal year output 47,375 tons.

Weaver No. 2 Mine; Drift; Lower Kittanning Seam; 60 to 72 in. thick.
PO—Weaver, W. Va.; SP—Same; CTY—Randolph; RR—Western Maryland, Weaver Branch.
MS—H. H. Harrison....Weaver, W. Va.
S of H—Mules and rope. Track gauge 42 in.
PP—1 Monroe return tubular boiler, total 80 H. P.
EMP—119. Last fiscal year output 111,702 tons.

Dartmoor No. 4 Mine; Slope; Lower Kittanning Seam; 48 to 60 in thick.
PO—Dartmoor, W. Va.; SP—Same; CTY—Barbour; RR—Western Maryland.
MS—H. H. Harrison....Weaver, W. Va.
S of H—Mules, rope and 4 elec. locos. Track gauge 42 in
PP—2 Phoenix return tubular boilers, total 300 H. P., one 250 K. W. gen. unit, 550 volts D. C., one 200 gal. steam pump.
EMP—166. Last fiscal year output 180,925 tons.

Elk Garden No. 6 Mine; Drift; Big Vein (Pittsburgh) Seam; 120 to 188 thick.
PO—Elk Garden, W. Va.; SP—Same; CTY—Mineral; RR—Western Maryland, Elk Garden branch.
MS—J. E. Ott.....Elk Garden, W. Va.
S of H—Mules and 1 steam loco. Track gauge 42 in.
EMP—46. Last fiscal year output 36,795 tons.

PP—Central Power Station at Thomas, W. Va., has the following equipment:
One 2500 K. W. turbo-generator, two 1000 K. W. turbo-generators, two 300 K. W. rotary converters with transformers, three 400 K. V. A. 600-22000 volt transformers, six 400 K. V. A. 600-6600 volt transformers, five 400 H. P. B. & W. water tube boilers with Jones Under-Feed Automatic Stokers, two 500 H. P. Keeler water tube boilers with Jones Under-Feed Stokers.

DAVIS COLLIERY CO.
General Office, Elkins, W. Va.
PR—John T. Davis.....Elkins, W. Va.
VP—R. B. Isner, " "
TR—C. M. Hendley....Elkins, W. Va.
GM—R. B. Isser.......Elkins, W. Va.
GS—J. B. Bischoff, " "
EM—R. J. Tillson, ..Coalton, "
EE—C. O. Gallaher, " "
SCO—Junior Mercantile Co., Buyer H. R. Jones, Coalton, W. Va.
Eastern Sales Mgr., F. F. Chadwick, Land Title Bldg., Phila. Pa.
Western Sales Manager, Maury Robinson, 8 East Long St., Columbus, Ohio.

No. 1 Colliery, Drift, Lower Kittanning 6 to 10 ft. thick.
PO—Coalton, W. Va., SP—Same, CTY—Randolph. RR—Coal & Coke Ry.
MS—Jos. Hoylman....Coalton, W. Va.
S of H—6 Elec. loco.; track gauge 42 in.
S of M—Hand, and 6 elec. mach.
PP—6 Return tubular boilers, total 900 H. P., 2 gen. units 550 volts D. C. 1 pump.
EMP—300. 250 Bee Hive coke ovens.
Last fiscal year output 180,900 tons coal; 44,715 tons coke.

No. 2 and No. 5 Collieries, Drifts, Lower Kittanning Seam, 6 to 10 ft. thick.
PO—Harding W. Va., SP—Roaring Creek Jct., W. Va., CTY—Randolph. RR—Coal & Coke Ry.
MS—Leslie Wilmoth..Harding, W. Va.
SM—J. P. Minear, " "
S of H—Mules and gravity plane, track guage 42 inches.
S of M—Hand.
EMP—76. Last fiscal year output 43,325 tons.

No. 3 Colliery, Drift, Lower Kittanning Seam, 6 to 7 ft. thick.
PO—Harding, W. Va., SP—Same, CTY—Randolph. RR—Western Md
MS—A. C. Davis........Harding, W. Va.
SM—J. P. Minear, " "
S of H—3 Elec. loco., track gauge 45 in.
S of M—Hand and 4 Elec. mach.
PP—550 volts D. C.
EMP—150. 85 Bee Hive coke ovens.
Last fiscal year output 123,691 tons coal, and 22,666 tons coke.

No. 4 Colliery, Drift, Lower Kittanning Seam, 5 to 6 ft. thick.
PO—Junior, W. Va., SP—Same, CTY—Barbour, RR—Western Maryland
MS—W. S. Wilson....Junior, W. Va.
SM—L. D. Shure, " "
S of H—Rope and mules; track gauge 42 in.
S of M—Hand.
PP—1 Erie City 150 H. P. boiler.
EMP—115. 51 Bee Hive coke ovens.
Last fiscal year output 17,470 tons coal, 3,079 tons coke.

No. 10 Colliery, Drift, Pittsburgh No. 8 Seam, 6 to 9 ft. thick.
PO—Bower, W. Va., SP—Same, CTY—Braxton. RR—Coal & Coke.
MS—Thos. Davies......Bower, W. Va.
SM—C. J. Burton, " "
S of H—Mules and 3 Elec. loco.; track gauge 42 inches
S of M—Hand and 8 Elec. mach.
PP—3 Erie City return tubular boilers, total 450 H. P., 2 gen. units 550 volts D. C. 1 pump.

(Continued on Next Page)

Davis Colliery Co.—Cont.
EMP—165. Last fiscal year output 200,762 tons.

No. 11 Colliery, Drift, Pittsburgh No. 8 Seam, 6 to 9 ft. thick.
PO—Bower W. Va., SP—Copen, W. Va., CTY—Braxton. RR—Coal & Coke.
MS—Thos. Davis......Bower, W. Va.
SM—C. J. Burton, " "
S of H—Mules and 1 elec. loco., track gauge 42 in.
PP—1 Return tubular 50 H. P. boiler, 1 pump.
EMP—75. Last fiscal year output 72,748 tons.

DAVIS, T. B., ESTATE OF,
See Robinson Coal Co.

DAVY-POCAHONTAS COAL CO.,
General Office, Baltimore Maryland.
No. 1 and No. 2 Mines, Drifts, War Creek and Sewell Seams. War Creek 5 to 8 ft. thick, Sewell 3 to 4 in. thick.
PO—Roderfield, W. Va., SP—Erin, W. Va., CTY—McDowell. RR—Norfolk & Western.
PR—W. L. Taylor....Baltimore, Md.
VP—R. E. Wood, " "
TR—G. L. Wood, " "
Sec—G. L. Wood, " "
GS—P. A. Grady,..Roderfield, W. Va.
PA—Earl McCoy, " "
SM—Earl McCoy, " "
FE—J. W. Lindsey, " "
EM—G. J. Cooper........Welch, W. Va.
S of H—Mules and 2 elec. motors, track gauge 48 in.
S of M—Pick mining and 2 elec. mach.
PP—2 Return tubular boilers, total 300 H. P., 1 gen. unit 250 volts D. C. 2 pumps.
EMP—150. Last fiscal year output 89,000 tons.
Sales Agency, Baltimore, Md., Office.

DEAKER HILL COAL CO.
General Office, Akron, O.
PR—J. M. Carr ....Akron, O.
TR—A. T. Carnahan " "
GM—A. T. Carnahan " "
Note—Just starting drift mine at Kingwood, W. Va.

DEEGANS EAGLE COAL COMPANY
General Office, Huntington, W. Va.
Avon Mine; Drift; Eagle & Island Creek Seam; 50 to 66 in. thick.
PO—Accoville, W. Va.; SP—Same; CTY—Logan; RR—C. & O., Guyan Valley Branch.
PR—W. L. Deegans..Huntington, W. Va.
GM—W. L. Deegans, " "
TR—John Faulkner, " "
PA—John Faulkner, " "
SM—John Faulkner, " "
MS—S. E. Scholl.....Accoville, W. Va.
S of H—Mules and 3 elec. locos. Track gauge 42 in.
S of M—5 elec. machs.
PP—4 return tubular boilers, total 600 H. P., 1 gen. unit, 250 volts D. C., 2 pumps.
Last fiscal year output 128,000 tons.
Sales agencies, Clear Creek Coal Co., Huntington, W. Va., and Poca Winifrede Coal Co., Huntington, W. Va.
Note—Formerly operated by Avon Coal Co.

DEEP RUN BIG VEIN COAL COMPANY
General Office, Elk Garden, W. Va.
Mines Nos. 1, 2, 3, 4, 5; Drifts; Freeport, Bakertown, George's Creek Big Vein, 144 in. to 228 in. thick.
PO—Elk Garden, W. Va.; SP—Shaw, W. Va.; CTY—Mineral; RR—Western Maryland.
PR—Charles H. Lantz, Hagerstown, Md.
TR—H. A. Meyer.......Davis, W. Va.
GM—W. R. Nethken..Hagerstown, Md.
GS—Robert Grant....Elk Garden, W. Va.
PA—Robert Grant " "
CE—Robert Grant " "
EM—Robert Grant " "
S of H—Horses and 1 storage battery loco.
S of M—Hand
EMP—75. Daily output 300 tons.
Sales Mgr., C. H. Lantz, Hagerstown, Md.

DEITZ COLLIERY CO.
Deitz Mines, Drifts, No. 2 Gas Seam, 4 ft. thick, and No. 5 Splint Seam, 5 ft. thick.
PO—Wyndal, W. Va., SP—Same, CTY Fayette. RR—C. & O.
PR—F. P. Christian..Lynchburg, Va.
TR—T. A. Deitz....Vanetta, W. Va.
GM—T. A. Deitz, " "
GS—T. A. Deitz, " "
PA—T. A. Deitz, " "
MS—L. D. Moran....Wyndal, W. Va.
SM—John Dickinson, " "
S of H—1 Elec. and 1 Gasoline loco.; track gauge 40 in.
S of M—Hand.
PP—Purchase power.
EMP—120. Last fiscal year output 40,490 tons.

DELMAR COAL CO.
General Office, Fairmont, W. Va.
Drift Mine; Pittsburgh Seam, 72 to 96 in. thick.
PO—Flemington, W. Va.; SP—Same; CTY—Taylor; RR—B. & O.
PR—J. F. Phillips, Fairmont, W. Va.
TR—Hugh T. Smith, " "
GM—C. D. Robinson, " "
PA—C. D. Robinson, " "
CE—West Virginia Engineering Co., Fairmont, W. Va.
MS—Perry Popee, Flemington, W. Va.
S of H—Mules; track gauge 42 in.
S of M—Hand.
Sales Agency, C. D. Robinson, Fairmont, W. Va.

DEVILS FORK COAL CO.
General Office Devils Fork, W. Va.
Devils Fork Mine; Drift; No. 3 Pocahontas Seam; 45 to 54 in. thick.
PO—Devils Fork, W. Va.; SP—Same; CTY—Wyoming; RR—Virginian, Winding Gulf branch.
PR—Frank R. Hewitt, Bramwell, W. Va.
TR—L. N. Frantz.....Mullens, W. Va.
GM—Richard Hewitt, Devils Fork, W. Va.
PA—Richard Hewitt, " "
SM—R. P. Deyerle, " "
S of H—1 elec. loco.
S of M—1 elec. mach.
PP—2 pumps. Purchase power.
EMP—75. Last fiscal year output 36,000 tons.

DEWITT FUEL COMPANY
General Office, Mt. Hope, W. Va.
DeWitt Mine; Drift; Sewell Seam; 64 to 72 in. thick.
PO—Harvey, W. Va.; SP—DeWitt; CTY—Fayette; RR—C. & O., Loop Creek branch.
PR—P. M. Snyder....Mt. Hope, W. Va.
TR—T. H. Snyder, " "
GM—T. H. Snyder, " "
PA—T. H. Snyder, " "
EM—N. P. Rinehart, " "
MS—R. M. Shumate.....Harvey, W. Va.
SM—J. L. Baber, " "
SCO—Snyder-Carter Co., Mt. Hope, W. Va.
S of H—Mules.
S of M—Hand.
EMP—40.

DOUGLAS COAL COMPANY
General Office, Welch, W. Va.
Drift Mine; Douglas Seam; 45 to 68 in. thick.
PO—Not yet named; SP—Pemberton, W. Va.; CTY—Raleigh; RR—Virginian.
PR—Wm. Leckie.......Welch, W. Va.
GM—Wm. Leckie, " "
PA—Wm. Leckie, " "
TR—A. E. Jennings, " "
GS—A. F. Leckie, R. F. D. Pemberton, W. Va.
MS—A. F. Leckie, R. F. D. Pemberton, W. Va.
CE—J. H. Williams... Welch, W. Va.
EM—M. H. Hall, Pemberton, W. Va., R. F. D.
S of H—Elec. locos.
S of M—Machines.
PP—Purchase power.

DRAPER COAL & COKE CO.
General Office, Roanoke, Va.
Draper Mine; Drift, Eagle Seam, 48 to 70 in. thick.
PO—Logan, W. Va.; SP—Same; CTY—Logan; RR—C. & O., Guyan River Br.
PR—L. H. Vaughan......Roanoke, Va.
TR—J. B. Vaughan, " "
GM—L. H. Vaughan....Logan, W. Va.
PA—Rex Brugh, " "
MS—Chas. Miller, " "
EM—Beddow & McCorkle, " "
EE—Onte Stultz, " "
SCO—Address the Company. Buyer, T. A. Obensham, Logan, W. Va.
S of H—2 Elec. loco.; track gauge 44 in.
S of M—5 Elec. mach.
PP—1 Boiler 200 H. P., 1 gen. unit 250 volts D. C.
EMP—55. Last fiscal year output 50,000 tons.
Sales Agency, A. S. Nowlin & Co.

DWYER, J. W.
J. W. Dwyer Coal Works Mine; Drift; Firecreek Seam; 52 in. thick.
PO—Rainelle, W. Va.; SP—Same; CTY—Greenbrier; RR—B. & O., Loop & Lookout branch.
PR—J. W. Dwyer......Rainelle, W. Va.
GM—J. W. Dwyer, " "
PA—J. W. Dwyer, " "
S of H—Mules. Track gauge 36 in.
S of M—Hand.
EMP—25.

EAGLE COAL COMPANY
General Office, Montgomery, W. Va.
Eagle Coal Co. Mine; Drift; Eagle Seam. 44 to 48 in. thick.
PO—Box 156, Montgomery, W. Va.; SP—Same; CTY—Fayette; RR—C. & O. Main line.
PR—A. McKinney, Montgomery, W. Va.
GS—A. McKinney, " "
TR—Mathew Buster, " "
GM—Mathew Buster, " "
PA—Mathew Buster, " "
CE—J. H. Jackson, " "
EM—J. H. Jackson, " "
MM—Ed. Bullard, " "
EE—Ed. Bullard, " "
SM—Mathew Buster, " "
SCO—Eagle Coal Co.
S of H—Mules.
S of M—Hand.
PP—Purchase power.
EMP—20. Daily output, 100 tons.

EAGLE ISLAND COAL CO.
General Office, Huntington, W. Va.
Kistler Mine; Drift, Island Creek and Eagle Seams, 48 to 72 in. thick.
PO—Kistler, W. Va.; SP—Same CTY—Logan; RR—C. & O., G. V. Div.
PR—A. J. King....Charleston, W. Va.
GM—A. J. King, " "
PA—A. J. King, " "
TR—W. H. Cunningham, Huntington, W. Va.
EM—E. R. Rink........Logan, W. Va.
MS—Edwin Jones......Kistler, W. Va.
S of H—2 Elec. loco.; track gauge 44 in.
S of M—3 Elec. mach.
PP—1 Return tubular boilers, 150 H. P., gen. unit 250 volts D. C., 1 pump.
EMP—50.
Sales Agency, Chesapeake & Virginian Coal Co., Lynchburg, Va.

DRY BRANCH COAL CO.
Dry Branch Mine; Drift; Lewiston Seam, 38 to 44 in. thick and Coalburg Seam 60 to 96 in. thick.
PO—Dry Branch, W. Va.; SP—Same; CTY—Kanawha; RR—C. & O., Cabin Creek Branch.
PR—C. C. Dickinson...Malden, W. Va.
GM—C. C. Dickinson " "
TR—J. L. Dickinson, Charleston, W. Va.
GS—C. M. Davidson, Dry Branch, W. Va.
PA—C. M. Davidson " "
MS—C. C. Bailes " "
EM—B. M. Green.....Charleston, W. Va.
EE—John Holstine, Dry Branch, W. Va.
SM—R. W. Francis " "
S of H—Mules and 2 elec. locos.
S of M—6 elec. machines.
PP—2 water tube boilers, Erie; 400 H. P., 1 gen unit, D. C., 1 pump, also purchase power.
EMP—150. Last fiscal year output 41,816 tons.
Note—Output affected owing to six months' strike.

DRY FORK COLLIERY CO.
General Office, Bluefield, W. Va.
Dry Fork Mine; Slope; War Creek Poca. Seam, 63 to 75 in. thick.
PO—Yukon, W. Va.; SP—Susanna, W. Va.; CTY—McDowell; RR—N. & W.
PR—W. T. Williams, Bluefield, W. Va.
GM—W. T. Williams, " "
PA—W. T. Williams, " "
TR—J. T. Wilson, " "
MS—W. H. Powell....Yukon, W. Va.
EM—H. J. Brook, ...Welch, W. Va.
SCO—Address the Co., Yukon, W. Va.

S of H—2 Elec. loco. and mules; track gauge 48 in.
S of M—1 Elec. mach.
PP—Power purchased.
EMP—75. Last fiscal year output 121,000 tons.

DUN GLEN COAL CORP.
Out of business.

EAST BANK MINING CO.
East Bank Mine, Drift; "Cedar Grove" Seam; 34 to 40 in. thick.
PO—East Bank, W. Va.; SP—Same, CTY—Kanawha. RR—C. & O.
PR—P. S. Banister...East Bank, W. Va.
TR—S. I. Johnson, " "
GM—A. M. Howery, " "
PA—A. M. Howery, " "
MS—A. M. Howery, " "
S of H—Mules, track gauge 3 ft.
S of M—Hand.
SCO—Address the Company. Buyer, A. M. Howery, East Bank, W. Va.
EMP—25. Output for 8 months 8,000 tons. Sales agent, C. & O. Coal Agency Co.

EAST GULF COAL CO.
General Office, Beckley, W. Va.
Drift Mine; New River Seam.
PO—Not yet named; CTY—Raleigh; RR—C. & O., Virginian, Winding Gulf Br.
PR—P. M. Snyder, Mt. Hope, W. Va.
TR—J. L. Bumgardner, Beckley, W. Va.
GM—S. M. Miller, " "
CE—E. M. Merrill, " "
S of H—Electric.

EAST LYNN COAL CO.
Sagamore Mine, Drift, Seam 45 to 60 in. thick.
PO—East Lynn, W. Va. SP—Same. CTY—Wayne. RR—N. & W.
PR—Isaac T. Mann..Bramwell, W. Va.
TR—A. J. Perry...East Lynn, W. Va.
GM—A. J. Perry, " "
GS—Okey Loyd, " "
PA—J. L. Arthur, " "
SM—J. L. Arthur, " "
MM—W. M. Porter, " "
EE—W. M. Porter, " "
EM—C. D. Boggess.....Ashland, Ky.
S of H—Mules and 1 elec. loco. Track gauge 42 in.
S of M—4 elec. mach.
PP—1 water tube boiler, 150 H. P., 1 gen. unit, 250 volts D. C.
EMP—91. Last fiscal year output 73,739.

ELK LICK COAL CO.
General Office, Scranton, Pa.
Spruce Knob Mine, Drift.
PO—Richwood, W. Va. SP—Same. CTY—Nicholas. RR—B. & O.
GM—F. L. Space.....Scranton, Pa.
PA—John L. Hamill...Richwood, W. Va.
MS—H. P. Jones " "
SM—Richwood Store Co., Mgr. T. M. Richards, Richwood, W. Va.
S of H—Mules.
S of M—Hand.
EMP—40
(Old information.)

ELK MANOR COAL CO.
See Thompson Land Coal Co.

ELK RIDGE COAL & COKE CO.
Drift Mine, No. 3 Poca Seam, 72 to 84 in. thick.
PO—Northfork, W. Va.; SP—Same; CTY—McDowell; RR—N. & W., North Fork Br.
PR—Isaac T. Mann....Bramwell, W. Va.
TR—L. E. Tierney....Powhatan, W. Va.
GM—L. E. Tierney, " "
GS—T. W. Fitzsimmons....Kyle, W. Va.
CE—G. H. Wilcox, " "
PA—A. K. Parker....Northfork, W. Va.
MS—James Armstrong, " "
SM—Otis Linkous, " "
EE—E. B. Stone....Powhatan, W. Va.
S of H—3 Steam loco.; track gauge 44 in.
S of M—Hand.
PP—4 Return tubular boilers, total 290 H. P., 1 pump.
EMP—160. Last fiscal year output 125,553 tons. 180 Bee Hive Coke Ovens.
Sales Agency, Pocohontas Fuel Co., New York, N. Y.

ELK RIVER COAL & LUMBER CO
General Office, Clay, W. Va.
Rich Run Mine, Drift, Roaring Creek Seam, 5 to 6 ft. thick.
PO—Dundon, W. Va. SP—Same. CTY—Clay. RR—Buffalo Creek & Gauley R. R.
PR—J. M. Cameron, Harrisburg, Pa.
TR—J. M. Cameron, " "
GM—J. G. Bradley.....Dundon, W. Va.
PA—J. G. Bradley, " "
GS—R. T. Price........Widen, W. Va.
MS—J. A. Cosgrove, " "
EM—H. E. Snyder, " "
EE—N. A. Johnson, " "
CE—Baird Halberstadt, Pottsville, Pa.
SCO—Widen Store, Widen, W. Va. Buyer. Peter Bettinger.
S of H—9 elec. loco. Track gauge 42 in.
S of M—9 Sullivan elec. mach.
PP—4 Erie City return tubular boilers, total 600 H. P. 3 Gen. units 250 volts D.C.
EMP—350. Last fiscal year output 497,000 tons.
General Sales Manager, J. G. Bradley, Clay, W. Va.; Western Sales Manager, C. M. Anderson, Columbus, O.; Eastern Sales Agency, Ernest Law & Co., Philadelphia, Pa.

ELKHORN COAL & COKE.
General Office, Maybeury, W. Va.
Elkhorn Mine; Drift; Pocahontas No. 3 Seam, 8 ft. to 10 ft. 6 in. thick.
PO—Maybeury, W. Va.; SP—Krag, W. Va.; CTY—McDowell. RR—N. & W., Switchback branch.
PR—Wm. C. Atwater, 1 Broadway, N. Y.
TR—Chas. P. Hutchins, 50 Congress Boston, Mass.
GM—C. B. Smith....Maybeury, W. Va.
PA—C. B. Smith, " "
EM—C. R. Smith, " "
MS—J. R. Little, " "
EE—E. V. Bailey, " "
MM—E. V. Bailey, " "
SM—W. C. Hall,..Maybeury, W. Va.
S of H—Mules, 3 steam loco. Track gauge 44 in.
S of M—Hand.
PP—2 return tubular boilers, total 300
SCO—Elkhorn Store. Buyer, W. C. Hall, Maybeury, W. Va.
H. P., 220 volts A. C., 3 phase, 60 cycles, 4 engines. Purchase power.
EMP—300. Last fiscal year output 272,000 tons. 130 Bee Hive Coke Ovens.
Sales agents, Wm. C. Atwater & Co., New York, N. Y.

ELKINS COAL & COKE CO.
General Office, Morgantown, W. Va.
PR—S. B. Elkins,
No. 1 Broadway, New York, N. Y.
TR—T. Frank Burk..Morgantown, W.Va.
GM—Richard Elkins.......Phila., Pa.
GS—J. B. Hanford, Morgantown, W. Va.
PA—C. F. Sutherland, " "
CHF E—B. J. McDermott " "
EM—B. J. McDermott, " "
MM—F. G. Mowery, Morgantown, W. Va.
EE—F. G. Mowery, " "
SCO—West Virginia Mercantile Co., Buyer, L. S. Meriditb, Morgantown, W. Va.
Sales Agent, S. B. Elkins, 1 Broadway, N. Y.

Mine No. 1, slope, Upper Freeport Seam, 4 ft. thick.
PO—Richard, W. Va. SP—Rock Forge, W. Va.; CTY—Monongalia; RR—M. & K. R. R.
MS—O. T. Barnard. Richard, W. Va.
SM—Davis Moore, " " "
S of H—Rope and 4 elec. loco. Track gauge 44 in.
S of M—Hand.
PP—3 Erie return tubular boilers, total 450 H. P. 1 Gen. unit, 250 volts D. C., 2 pumps.
EMP—166. Coke ovens, 150 Bee Hive. Last fiscal year output 132,274.79 tons.

Mine No. 2; Slope; Upper Freeport Seam, 4 ft. thick.
PO—Bretz, W. Va. SP—Same. CTY—Preston. RR—M. & K. R. R.
MS—Joseph Hanford, Brets, W. Va.
SM—H. B. Jackson, " "
S of H—7 Elec. loco.; track gauge 44 in.
S of M—Hand.
PP—8 Erie return tubular boilers, total 1200 H.P. 3 Gen. units, 250 volts D.C. and 2200 volts A. C. 3-phase 25-cycle, 3 pumps.
EMP—175. Coke ovens, 267 Bee Hive. Last fiscal year output 203,122.94 tons.

Mine No. 3; Slope; Upper Freeport Seam, 48 in. thick.
PO—Richard, W. Va. SP—Dellslow, W. Va. CTY—Monongalia. RR—M. & K. R. R.
MS—O. T. Barnard, Richard, W. Va.
SM—Davis Moore........Richard, W.Va.
S of H—1 Elec. loco. Track gauge 44 in.
S of M—Hand.
PP—Power furnished from Mine No. 1.
EMP—18. Last fiscal year output 17,240.99 tons.

Mine No. 4; Slope; Upper Freeport Seam, 4 ft. thick.
PO—Kingwood, W. Va. SP—Same. CTY—Preston. RR—M. & K. R. R.
MS—I. B. Bowermaster, Kingwood, W. Va.
SM—H. P. Miller, Kingwood, W. Va.
S of H—3 Elec. loco. Track gauge 44 in.
S of M 3 Elec. machines and hand mining.
PP—2 Return tubular boilers. total 300 H.P. 1 Gen. unit 250 volts D.C.
EMP—84. Last fiscal year output 72,728.79 tons.

Mine No. 5; Slope; Pittsburgh Seam, 96 in. thick.
PO—Morgantown, W. Va. SP—Sabraton, W. Va.; CTY—Monongalia; RR—M. & K. R. R.
MS—Floyd Gandy, Morgantown, W. Va.
SM—Victor Cuppett, Morgantown, W. Va.
S of H—5 Elec. loco. Track gauge 44 in.
S of M—4 Elec. machines and hand mining.
PP—Purchase power. 3 pumps.
EMP—98. Last fiscal year output 120,363.92 tons.

Mine No. 6; Slope; Upper Freeport Seam. 4 ft. thick.
PO—Masontown, W. Va. SP—Same. CTY — Preston. RR—M. & K. R. R.
MS—H. F. Loftus, Masontown, W. Va.
SM—J. C. Long.....Masontown, W. Va.
S of H—6 Elec. loco. Track gauge 44 in.
S of M—Hand.
PP—Power furnished from Mine No. 2. 3 pumps
EMP—163. Coke ovens. 80 Bee Hive. Last fiscal year output 212,124.97 tons.

Mine No. 7; Slope; Upper Freeport Seam, 4 ft. thick.
PO—Taylor. W. Va.; SP—Burk. W. Va. CTY—Preston. RR—M. & K. R. R.
MS—R. L. Wolfe.........Taylor, W.Va.
SM—C. W. Robinson, " "
S of H—2 Elec. loco. Track gauge 44 in.
S of M—Hand.
PP—Power furnished from Mine No. 2. 1 pump.
EMP—38. Last fiscal year output, 47,398.22 tons.

ELLIOTT SPLINT COAL CO.
General Office, Clay, W. Va.
York No. 1 Mine; Drift; Coalburg Seam, 66 to 77 in. thick.
PO—Clay, W. Va.; SP—Same; CTY—Clay; RR—Coal & Coke.
PR—George W. York......Cleveland, O.
TR—L. E. Ralston, " "
GM—C. L. Voglesang......Clay, W. Va.
PA—B. C. Barber, " "
MS—H. E. Taylor, " "
SCO—Address the Company. Buyer, A. C. Barber, Clay, W. Va.
EM—Romine & Snyder, Charleston, W.Va.
S of H—1 Elec. loco.; track gauge 42 in.
S of M—3 Elec. mach.
PP—2 Gem City return tubular boilers, total 300 H. P., gen. unit 250 volts D. C.
EMP—150. Last fiscal year output 66,490 tons.
Sales Agency, H. L. Warner, Cleveland, O., and Victoria Coal Co., Cleveland, O.

ELM GROVE COAL CO.
Elm Grove mine, shaft; Pittsburgh No. 8 Seam 4. to 5 ft. thick.
PO—Elm Grove. W. Va. SP—Same. CTY—Ohio. RR—B. & O.
PR—J. B. Chambers, Elm Grove, W. Va.
GM—J. B. Chambers, Elm Grove, W. Va.
PA—J. B. Chambers, Elm Grove, W. Va.
TR—W. R. Chambers, Elm Grove, W. Va.
MS—Harry Lewis.....Elm Grove, W. Va.
EE—Harry Lewis, " "
SCO—Elm Grove Store Co. Buyer, H. A. Glitsch, Elm Grove, W. Va.
S of H—1 Electric loco.
S of M—4 Electric machines.
PP—2 Return Tubular Boilers, total 60 H. P.; purchase power.
EMP—50. Last fiscal year output, 40,000 tons.

ELMO MINING CO. (THE)
General Office, Charleston, W. Va.
Elmo Mine; Drift; Sewell Seam, 30 to 36 in. thick.
PO—Elmo, W. Va., SP—Same; CTY—Fayette. RR—C. & O.
PR—C. A. Brockman..Charleston, W. Va.
TR—C. A. Brockman, " "
PA—C. A. Brockman, " "
MS—C. A. Brockman, " "
EM—S. H. Bridge, Quinnimont, W Va.
SCO—The Elmo Mining Co. Buyer, W. A. Phillips, Elmo, W. Va.
S of H—Mules and 1 Elec. loco. Track gauge 36 inches.
S of M—4 Elec. mach.
PP—4 Water tube boilers, total 500 H. P. 1 Gen. unit 250 volts D. C.
EMP—55. Last fiscal year output 30,271 tons.
Sales agents. West Va. Coal Co., Richmond, Va.

EMORY RUN COAL CO.
See O. D. Harris Sons Coal Co.

EMPIRE COAL & COKE CO.
General Office, Landgraff, W. Va.
Empire Mine. Drift. No. 3 Pocahontas Seam, 6 ft. thick.
PO—Landgraff. W. Va. SP—East Vivian. W. Va., CTY—McDowell. RR—N. & W.
PR—Wm. D. Ord.....Landgraff, W. Va.
TR—Wm. C. Atwater, 1 Broadway, N Y.
GM—Wm. D. Ord, Landgraff, W Va.
PA—J. C. Williams...Landgraff, W. Va
MS—D. W. Farquharson, Landgraff, W Va.
EM—C. B. Smith...Maybeury, W. Va.
MM—Chas. H. Tyler, Landgraff, W. Va.
EE—Chas. H. Tyler, Landgraff, W Va.
SM—W. L. Alexander, Landgraff, W Va.
S of H—Mules and 3 Elec. loco.; track gauge 44 in.
S of M—Hand.
PP—2 Atlas water tube boilers, total 450 H P. 2 Gen units, 250 volts D. C., 1 compressor, 3 pumps.
EMP—350. 250 Bee Hive coke ovens.
Last fiscal year output 308,003 tons.
Sales Agent, Wm. C. Atwater & Co. Broadway, N. Y.

ENNIS COAL CO.
Hiawatha Mine, Drift, Poca No. 3 Seam 60 in. thick.
PO—Hiawatha, W. Va.; SP—Same; CTY—Mercer; RR—N. & W.
PR—Edw. J. McQuail..Hiawatha, W.Va.
TR—J. A. McQuail, " "
MS—J. P. Johnson, " "
EM—Thos. DeVinney, " "
SCO—Address the Company, " "
S of H—Elec. loco. Track gauge 56½ in.
S of M—Elec. mach.
PP—3 Erie Water tube boilers, total 450 H. P. ,2 gen. units 250 volts D. C.
EMP—190. Last fiscal year output 124,800 tons.
Successors to the Hiawaha Coal & Coke Co.

EPHRAIM CREEK COAL & COKE CO.
General Office, 11 Broadway, New York, N. Y.
Buffalo and Slater Mines, Drifts. Fire Creek Seam, 3½ to 4 ft. thick.
PO—Thayer, W. Va. SP—Same. CTY—Fayette. RR—C. & O., Main Line.
PR—A. A. Houghton, Corning N. Y.
TR—M. C. Jones, New York, N. Y.
GM—M. C. Jones, New York, N. Y.
PA—M. C. Jones, New York, N. Y.
GS—Wm. Warner, Thayer, W. Va.
EE—T. C. Harmon, Thayer, W. Va.
EM—Philip Konrad, Kanawha Falls, W. Va.
SCO—Ephraim Creek Coal & Coke Co., buyer, P. V. Twohig, Thayer, W. Va.
S of H—11 elec. loco. Track gauge 44 in.
S of M—5 Elec. machines and hand mining.
PP—5 Water tube boilers. total 750 H. P., 3 gen. units 550 volts D. C. 2 pumps.
EMP—225. Last fiscal year output 160,000 tons.
Sales Agents (Eastern Agency) C. & O. Agency Co., Boston. Mass. (Western Agency) E. L. Hedstrom & Co., Chicago, Ill.

ETHEL COAL CO., (THE)
Ethel Mine, Drift, Seam 5½ ft. thick.
PO—Ethel, W. Va.; SP—Same; CTY—Logan. RR—C. & O., Guyan Valley branch.
PR—Harry Bowen, Bramwell, W. Va.
TR—J. C. Pack, Bramwell, W. Va.
GM—L. Epperly, Ethel, W. Va.
PA—L. Epperly, Ethel, W. Va.
EM—J. D. Martin........Logan, W.Va.
SM—A. L. Rupe.........Ethel, W. Va.
S of H—Mules and 5 elec. loco. Track gauge 44 in.
S of M—7 Elec. mach.
PP—4 Return tubular boilers, total 600 H. P., 2 gen. units 250 volts D. C. 4 pumps.
EMP—210. Last fiscal year output 209,000 tons.
Sales Agency, Smokeless Fuel Co.

EUREKA COAL & COKE CO.
Eureka Mine, Drift, Pocahontas No. 3 Seam, 7 to 8 ft. thick.
PO—Eckman, W. Va., SP—Same, CTY—McDowell. RR—N. & W.
PR—L. E. Tierney.....Powhatan, W.Va.
TR—R. H. T. Adams, Jr., Lynchburg, Va.
GM—L. E. Tierney, Powhatan, W. Va.
GS—T. W. Chambers....Eckman, W.Va.
PA—T. W. Chambers....Eckman, W.Va.
EM—G. H. Wilcox, Kyle, W. Va.
SCO—Eureka Coal & Coke Co. Buyer, P. B. Sleet, Powhatan, W. Va.
S of H—Mules and 3 steam loco. Track gauge 44 in.
S of M—Hand.
PP—4 boilers, 480 H. P.
EMP—275. Last fiscal year output, 240,000 tons. 200 Bee Hive coke ovens. Sales agents, Crozier-Pocahontas Co., Philadelphia, Pa.

EUREKA COAL CO.
General Office, Athens, Ohio.
Eureka Nos. 1, 2, 3 and 4. Slope and drift. No. 2 Gas, Winifrede, and No. 5 Block Seam, 4½ to 9 ft thick.
PO—Donwood, W. Va. SP—Montgomery, W. Va., CTY—Kanawha RR—C. & O.
PR—C. D. Hopkins, Athens, Ohio.
TR—C. D. Hopkins, Athens, Ohio.
GM—C. D. Hopkins, Athens, Ohio.
GS—Martin Welch.......Donwood, W Va.
SM—Ray Young.........Donwood, W Va.
EM—J. H. Jackson...Montgomery, W Va.
S of H—Mules, rope and 5 elec. loco. Track gauge 42 in.
S of M—8 Electric machines.
PP—3 Return tubular boilers, total. 300 H. P. 250 volts D. C. 3 pumps.
EMP—180

EVANS COAL CO
Evans Mine; Stripping; Seam 38 in. thick.
PO—Lex W Va; SP—Gluck; CTY—McDowell; RR—N. & W., Dry Fork Branch.
TR—E. M. Evans, ...Lex, W.Va.
GM—E. M. Evans, " "
PA—E. M. Evans, " "
MS—H. W. Evans, " "
MM—D. D. Evans, " "
SCO—W. E. Kennedy, " "
CE—H. J. Brook, " "
S of H—Mules, 1 storage battery loco. Track gauge 48 in.
S of M—Hand.
EMP—18. Last fiscal year output 24,000 tons.

EVANS & SONS.
Great Kanawha Mine, Drift, Eagle No. 1 and 2 gas Seams, 4 ft. 4 in. thick.
PO—Mt. Carbon, W. Va. SP—Same. CTY—Fayette. RR—C. & O.
PR—Zach Evans, Mt. Carbon, W. Va.
TR—Earl Evans, Mt. Carbon, W. Va.
GM—Zach Evans, Mt. Carbon, W. Va.
GS—Zach Evans, Mt. Carbon, W. Va.
PA—Harry Evans, Mt. Carbon, W. Va.
SM—Harry Evans, Mt. Carbon, W. Va.
S of H—Motor; track gauge 36 in.
S of M—1 Elec. mach.
PP—2 boilers, total 220 H. P.
EMP—22. Last fiscal year output 15,000 tons.
Sales Agency, C. & O. Coal & Coke Co.

EXCELSIOR COAL COMPANY
General Office, Excelsior, W. Va.
Excelsior No. 1 and 2 Mines; Drift; War Creek Seam; 40 to 72 in. thick.
PO—Excelsior; W. Va.; SP—Same, (Prepay; CTY—McDowell; RR—N. & W. Dry Fork branch.
PR—J. A. Huddleston..Excelsior, W. Va.
GM J. A. Huddleston, " "
PA—J. A. Huddleston, " "
GS—E. C. Lambert, " "
MS—M. C. Roberts, (No. 1 Mine) " "
MS—G. C. Kline, (No. 2 Mine) " "
EM—G. S. Borden, " "
MM—J. M. Hylton, " "
EE—A. L. Kemp, " "
SM—F. A. Weaver, " "
TR—W. W. Whyte......Welch, W. Va.
SCO—Excelsior Pocahontas Store Co.
S of H—10 elec. locos. Track gauge 44 in.
S of M—6 elec. mach.
EMP—350.
Note—Successors to Excelsior Pocahontas Coal Co.

EXCELSIOR POCAHONTAS COAL CO.
See Excelsior Coal Co.

EXPORT COAL CO.
Export Mine, Drift, "Fire Creek" Seam, 2 ft to 5 ft thick.
PO—Export, W. Va.; SP—Same, via. Quinnimont, W. Va.; CTY—Fayette; RR—C. & O., Laure Creek Br.
PR—J. E. Beury, MacDonald, W. Va.
TR—J. E. Beury, " " "
GM—J. E. Beury, " " "
GS—H. B. Clarkson, Thayer, W. Va.
PA—C. P. Morris, Jr., Export, W. Va
S of H—Mules and 1 Electric Locomotive. Track gauge, 44 in.
S of M—Hand.
PP—1 boiler, 1 gen. unit, 500 volts A. C. and 2 pumps.
EMP—50 to 60. Last fiscal year Output 32,000 tons.
Sales Agency, New River Coal Co.

EXTRAPOCA COAL CO.
Extrapoca Mine; Drift. Poca. No. 3 Seam, 96 to 108 in. thick.
PO—Bramwell, W. Va.; SP—Switchback, W. Va.; (Prepay) CTY—Mercer; RR—N. & W., Delta Br.
PR—Chas. W. Freeman, Bramwell, W.Va.
TR—H. S. Brown, " "
GM—J. E. Biggs, " "
CE—D. C. Jones, " "
MS—M. F. Henshey..Switchback, W. Va.
S of H—Mules; track gauge 44 in.
S of M—Hand.
EMP—20-30. Annual output to be 40,000 tons.
Sales Agency, West Virginia Coal Co., Richmond, Va.

FAIRMONT & BALTIMORE COAL & COKE CO.
Fairmont Mine, Drift, Pgh. Seam 6½ ft. thick.
PO—Adamston, W. Va.; SP—Same; CTY Harrison. RR—B. & O.
PR—A. P. Adams, ... Baltimore, Md.
VP—Howard Adams, " "
TR—Irving Adams, " "
GM—A. L. White....Adamston, W.Va.
PA—A. L. White, " "
MS—A. L. White, " "
CE—A. L. White, " "
MM—Geo. Lamb, " "
EE—Geo. Lamb, " "
EM—Horner Bros.....Clarksburg, W.Va.
SCO—Fairmore Store, Buyer, W. C. Sullivan, Adamston, W. Va.
S of H—Mules, 1 steam loco., rope; track gauge 40 in.
S of M—Hand and 2 elec. machines.

(Continued on Next Page)

Fairmont & Baltimore Coal & Coke Co.-Cont.
PP—Erie return tubular boiler, total 150 H. P., 650 volts, D. C., elec. power purchased.
EMP—175. Coke ovens, 30. (Not in use). Last fiscal year output 85,000 tons.
Sales Agent, S. M. Hamilton Coal Co., Baltimore, Md.

FAIRMONT & CLARKSBURG COAL CO.

General Office, Fairmont, W.Va.
Phoenix Mine; Slope; Pittsburgh, Seam 66 to 84 in. thick.
PO—Reynoldsville, W.Va.; SP—Same; CTY—Harrison; RR—B. & O.
PR—J. M. Orr, Reynoldsville, W.Va.
MS—J. M. Orr, " "
MM—George Wolf, " "
TR—John Y. Hite, Fairmont, W.Va.
GM—Lloyd Baily,.....Fairmont, W. Va.
PA—John Y. Hite, " "
EM—Sidney Britt, Clarksburg, W.Va.
S of H—Mules and rope; track gauge 42 in.
S of M—7 Comp. air mach.
PP—2 Erie City return tubular boilers, total 150 H.P., 1 compressor, 2 pumps.
EMP—60. Last fiscal year output 50,000 tons.
Formerly the Shield Coal Co.

FAIRMONT & CLEVELAND COAL CO.

General Office, Fairmont, W. Va.
Parker Run Mine; Drift, Sewickley Seam, 72 to 78 in. thick.
PO—So. Rivesville, W. Va.; SP—Same; CTY—Marion; RR—Monongahela.
EM—W. Va. Eng. Co...Fairmont, W. Va.
TR—J. F. Straight, " "
GM—W. E. Watson, Jr., " "
PA—W. E. Watson, Jr., " "
MS—C. E. Gaskill....Rivesville, W.Va.
CE—W. B. Hanlon......Cleveland, O.
SCO—Rivesville Supply Co., Rivesville, W. Va.
S of H—2 elec. loco. Track gauge 42 in.
S of M—7 elec. mach.
PP—3 Pumps. Purchase power.
EMP—150. Last fiscal year output 152,317 tons.
Sales Agency, Rosebud Fuel Co., Fairmont, W. Va.

FAIRPOINT-WEST VIRGINIA COAL CO.
General Office, Wheeling, Edgewood, W. Va.
Slope Mine; Pittsvein No. 8 Vein; 72 in. thick.
PO—Wheeling, W. Va.; CTY—Ohio.
PR—Frank G. Gable.....Fairpoint, O.
GM—Frank G. Gable, " "
MF—J. S. Gable, " "
CE—Boyd C. Green, Edgewood, Wheeling, W. Va.
EE—Richard Kidd. Edgewood, Wheeling, W. Va.
S of H—Mules and rope.
S of M—1 elec. mach.
EMP—14. Last fiscal year output 14,400 tons.

FAYETTE COAL & COKE CO.

Out of business. Succeeded by Fayette Smokeless Coal Co.

FAYETTE SMOKELESS COAL COMPANY

General Office, Fayette, W. Va.
Fayette Mine; Drift; Sewell Seam; 28 to 44 in. thick.
PO—Fayette, W. Va.; SP—Same; CTY—Fayette; RR—C. & O.
PR—W. F. Smith......Cincinnati, O.
TR—W. F. Smith, " "
GM—William Farrell...Fayette, W. Va.
PA—W. G. Campbell, " "
SM—E. G. Blume, " "
S of H—Mules and 2 elec. locos.
S of M—Hand and 3 elec. mach.
PP—2 return tubular boilers, total 225 H. P., 250 volts, D. C.
EMP—30.
Note—Successors to G M.. Blume Estate.

FEDERAL COAL & COKE CO

General Office, 111 Devonshire Street, Boston, Mass.
Federal Mine, Shaft, Pittsburgh Seam, 72 to 120 in. thick.
PO—Grant Town, W. Va. SP—Same CTY—Marion; RR—B. & O., Paw Paw Branch.
PR—J. L. Richards.......Boston, Mass.
TR—R. Grant, Boston, Mass.
CE—T. W. Sprague, Boston, Mass.
GS—J. W. Devison, Grant Town, W. Va.
MS—O. E. Hughes, " " "
PA—A. W. Herstine, Grant Town, W. Va.
EM—C. A. Phillippi, Grant Town, W. Va.
MM—A. D. Hudon, Grant Town, W. Va.
EE—W. J. Hines, Grant Town, W. Va.
SCO—Federal Coal & Coke Co. Buyer, H. A. Fultz, Grant Town, W. Va.
S of H—Horses, 10 Comp. air and 4 Elec loco.; track gauge 42 in.
S of M—Hand and 34 Comp. air mach.

PP—4 Wickes and 2 Rust Water tube boilers, total 2200 H. P., 2 gen. units, 250 volts D. C., 2 compressors, and 1 pump.
EMP—500. Coke ovens, 60 Bee Hive. Last fiscal year output 792,000 tons.

FIRE CREEK COAL & COKE CO.
General Office, Staunton, Va.
Fire Creek Mine, Drift, Fire Creek Seam.
PO—Fire Creek, W. Va. SP—Same. CTY—Fayette. RR—C. & O.
PR—H. B. Sproul........Stanton, Va.
TR—A. E. Miller, " "
GM—H. H. Blackburn. Fire Creek, W. Va
EM—H. H. Blackburn, " "
PA—H. H. Blackburn, " "
SM—J. A. Kincaid, " "
S of H—Rope, mules and elec. loco.
S of M—Hand.
PP—1 gen. unit, 500 volts, D. C. Buy power.
EMP—95. Coke ovens, 96 Bee Hive. Last fiscal year output 44,263 tons.

FIRE CREEK SMOKELESS FUEL CO.
General Office, Huntington, W. Va.
Beckley & Fire Creek Seam, 48 to 72 in. thick.
PO—(Not yet named); CTY—Raleigh. RR—Virginian, Stone Coal Branch.
PR—E. C. Taylor.......Besoco, W. Va.
GM—J. C. R. Taylor.....Page, W. Va.
GS—E. C. Taylor......Besoco, W. Va.
PA—E. C. Taylor, " "
VP—T. F. Bailey, Jr. Huntington, W.Va.
TR—J. C. R. Taylor......Page, W. Va.
S of H—Mules. Track guage 44 in.
PP—Purchase power.

FISCHER HARVEY.

Alum Rocks Mine; Drift; Pgh. Seam, 108 to 120 in. thick.
PO—Morgantown, W. Va.; CTY—Monongalia; RR—Buckhannon & Northern.
GM—Harvey Fischer, Morgantown, W. Va.
CE—G. B. Hartley, Morgantown, W. Va.
S of H—Mules and gravity; track gauge, 42 in.
S of M—Hand.

FLANAGAN COAL CO.
General Office, Shenandoah, Pa.
Flanagan Nos. 1 and 2 Mines; Drifts; War Creek and Davy Seams, 48 to 72 in. thick.
PO—Roderfield, W. Va.; SP—Same; CTY—McDowell; RR—N. & W., Spice Creek Br.
PR—J. H. Manley....Shenandoah, Pa.
GM—J. H. Manley, " "
TR—A. D. Gable, " "
MS—John F. Butler....Roderfield, W.Va.
EM—A. A. Gallagher, " "
S of H—Mules; track gauge 48 in.
S of M—1 Elec. mach.
PP—Power purchased.
EMP—42.

FLAT TOP COAL MINING CO.

General Office, Bramwell, W. Va.
Flat Top Mine, Slope, Pocahontas Seam, 3½ ft. thick.
PO—English, W. Va. SP—Same. CTY—McDowell; RR—N. & W.
PR—W. H. Thomas.....Bramwell, W.Va.
TR—W. H. Thomas, Bramwell, W. Va.
GM—W. H. Thomas, Bramwell, W. Va.
GS—Jas. Grainger.....English, W. Va.
PA—Jas. Grainger, " "
EM—H. J. Brook, " "
MM—O. H. Gillespie, " "
EE—O. H. Gillespie, " "
SCO—Flat Top C. M. Co. Store. Buyer, H. R. Parker, English, W. Va.
S of H—2 elec. loco. and rope. Track gauge 48 in.
S of M—2 elec. mach. and hand.
PP—Gen. units, 220 volts A. C. and D. C., 3 phases and 60 cycles, power purchased.
EMP—125. Last fiscal year output 81,000 tons.

FORT BRANCH COAL CORP.

General Office, Richmond, Va.
Fort Branch Mine; Drift Winifrede Seam, 4 to 6 ft. thick.
PO—Fort Branch, W. Va. SP—Same. CTY—Logan; RR—C. & O., Guyan Valley Branch.
PR—John W. Williams, Richmond, Va.
VP—Frederick E. Nolting, Richmond, Va.
TR—Geo. M. Reid, ... Richmond, Va.
GM—Geo. M. Reid, Richmond, Va.
PA—Geo. M. Reid, Richmond, Va.
MS—A. E. Thomas....Ft. Branch, W.Va.
SCO—Fort Branch Coal Corp Store. Buyer, E. D. Wells, Ft. Branch, W. Va.
S of H—2 Elec. and 1 Gas. loco.; track gauge 44 in.
S of M—3 Elec. Machines.
PP—2 Boilers, total 350 H. P. 1 Gen. unit 250 volts.
EMP—100. Last fiscal year output, 75,000 tons. Sales Agent, Fort Branch Coal Corp., Richmond, Va.

FORT DEFIANCE COAL & COKE CO.
Drift Mine, No. 2 Gas Seam, 52 to 60 in. thick.
PO—Fort Defiance, W.Va.; SP—Kanawha Falls, W. Va.; CTY— Fayette; RR—C. & O.
PR—W. A. Miller, Gauley Bridge, W.Va.
TR—F. H. Miller, " "
GM—G. J. Cottrell, Fort Defiance, W.Va.
GS—G. J. Cottrell, " "
PA—G. J. Cottrell, " "
MS—J. W. Rhodes, " "
EM—Philip Konrad, Kanawha Falls, W. Va.
EE—W. E. May...Fort Defiance, W. Va.
S of H—1 Elec. loco. and mules track gauge 42 in.
S of M—5 comp. air and 1 elec. mach.
PP—1 Water tube boilers, 150 H.P., gen. units 250 volts D. C.
EMP—85. Last fiscal year output 56,045 tons.
Sales Agency, Eastern Coal & Export Corp., Richmond, Va.

FORTUNE HUNTER COAL CO.

General Office Northfork, W. Va.
Fortune Hunter Mine; Drift; Pocahontas No. 3 Seam; 78 to 34 in. thick.
PO—Northfork, W. Va.; SP—Same; CTY—McDowell; RR—N. & W.
PR—L. H. Clark........Kyle, W. Va.
TR—A. K. Parker....Northfork, W. Va.
PA—A. K. Parker, " "
GM—G. H. Wilcox........Kyle, W. Va.
CE—G. H. Wilcox, " "
EM—G. H. Wilcox, " "
MS—J. F. Logan......Algoma, W. Va.
S of H—Mules and 1 elec. loco.
EMP—25. Last fiscal year output 29,620 tons.

FOUR STATES COAL CO.

General Office, Pittsburgh, Pa.
Officers of reorganization not yet named. Address Co., General office, Wabash Bldg., Pittsburgh, Pa.
SCO—Big Supply Co., Dorothy, W. Va., and Worthington, W. Va.
Sales agency, Pittsburgh-Buffalo Co., Frick Bldg., Pittsburgh, Pa.

Dorothy and Sarita Mines, Drift, Dorothy Seam, 9 to 20 ft. thick.
PO—Dorothy, W. Va. SP—Same. CTY Raleigh. RR—C. & O., Cabin Creek Branch of Coal River.
MS—Chas. E. Sandberg..Dorothy, W.Va
S of H—12 elec. loco. Track gauge 42 in.
S of M—12 elec. mach.
PP—6 Erie City return tubular boilers, total 900 H. P., 4 gen. units, 250 volts D. C., 2 elec. pumps.
EMP—150. Last fiscal year output 400,000 tons.

Annabelle Mine, Shaft, Pgh. or River Seam, 8 ft. thick.
PO—Worthington, W. Va. SP—Same. CTY—Marion. RR—B. & O., Monon. River Div.
MS—A. C. Beeson..Worthington, W. Va.
S of H—14 comp. air loco. Track gauge 48 in.
S of M—23 comp. air mach.
PP—Water tube boilers, total 1,500 H. P., 2 low and 2 high comp.
EMP—250. Last fiscal year output 600,000 tons.

FRANCOIS COAL & COKE CO.
Norwood Mine; Slope, Pgh. Seam, 84 to 108 in. thick.
PO—Clarksburg, W. Va.; SP—Same; CTY—Harrison; RR—B. & O.
PR—E. J. Francois..Clarksburg, W. Va.
TR—E. L. Sparker, " "
GM—V. E. Gocke, " "
PA—V. E. Gocke, " "
GS—Wm. McOlvin, " "
CE—Hornor Bros., " "
SCO—Address the Company. Buyer, H. A. Smith, Clarksburg, W. Va.
S of H—2 elec., 1 gasoline loco, steam loco. and mules. Track gauge 42 in.
S of M—2 Elec. mach.
PP—550 volts D. C., 1 engine, 1 pump. Power purchased.
EMP—75. Last fiscal year output 65,000 tons.

FRIEZE FORK COAL MINING CO.
General Office, Detroit. Mich.
Frieze Mine; Draft, Winifrede Seam, 42 to 60 in. thick.
PO—Ethel, W. Va.; SP—Same; CTY—Logan; RR—C. & O., Guyan Br.
PR—John J. Kean, Detroit, Mich.
TR—John F. Noud, South Haven, Mich.
GM—John F. Noud, " "
PA—C. W. Sanders......Ethel, W.Va.
MS—C. W. Sanders, " "
SCO—Address the Company, " "
CE—W. C. McCall.......Logan, W. Va.
S of H—2 Elec. loco.
S of M—2 Elec. mach.
EMP—40-50. Last fiscal year output 35,423 tons.
Sales Agency, Address the Company, Detroit, Mich.

GAGE COAL & COKE CO.
General Office, Oliver Bldg., Pittsburgh, Pa.
Sarah Mine; Drift, L. Freeport Seam, 60 to 72 in. thick.
PO—Junior, W. Va.; SP—Gage, W. Va.; CTY—Barbour; RR—W. Md., B. & O.
PR—W. D. Henry......Pittsburgh, Pa.
TR—A. M. Diehl, " "
GM—Charles S. Bygate, " "
PA—C. W. Shomo......Junior, W. Va.
GS—A. B. Spencer, " "
SCO—Gage Supply Co. Buyer, C. W. Shomo, Junior, W. Va.
S of H—1 Elec. loco. and mules.
S of M—2 Elec. mach.
PP—2 Return tubular boilers, total 300 H. P., gen. units 250 volts D. C.
EMP—60. Coke ovens 60 Bee Hive.
Last fiscal year output 60,000 tons.
Sales Agency, Theiss-Bygate Co., Pittsburgh, Pa.

GAULEY MOUNTAIN COAL CO. (THE)
General Office, Ansted, W. Va.
PR—Wm. N. Page....Ansted, W. Va.
TR—Chas. E. Hewitt, 50 Church St., New York, N. Y.
GM—R. C. Taylor....Ansted, W.Va.
EM—A. O. Hogue, " "
MM—E. L. Morris, " "
EE—E. L. Morris, " "
PA—E. L. Morris..........Jodie, W.Va.
Sales agent, Smokeless Fuel Co., No. 1 Broadway, New York, N. Y.
Ansted Mine, Drift, No. 2 Gas Seam.
PO—Ansted, W. Va. SP—Same. CTY—Fayette. RR—C. & C., Hawks Nest Branch.
MS—James A. Martin..Ansted, W.Va.
S of H—12 elec. locos.
S of M—5 elec. and 21 comp. air mach.
PP—7 Erie City boilers, 2 gen. units, 550 volts D. C.
EMP—400. Last fiscal year output 200,000 tons.
Coke ovens—152 Bee Hive.

Rich Creek Mine, Drift, No. 2 Gas Seam.
PO—Jodie, W. Va. SP—Price. CTY Fayette. RR—C. & O.. Gauley Branch.
MS—Jesse Blake ......Jodie, W.Va.
S of H—2 elec. locos.
S of M—5 elec. mach.
PP—1 Sterling water tube boiler, 1 gen. unit, 550 volts.
(Old information.)

GAY COAL & COKE CO. (THE)
Gay Mine, Drift, Island Creek No. 2 Gas Seam, 68 to 72 in. thick.
PO—Logan, W. Va.; SP—Gay Mines, W. Va.; CTY—Logan; RR—C. & O., Island Creek Br.
PR—Geo. W. Robertson..Shamokin, Pa.
TR—C. K. Robertson, " "
GM—H. S. Gay........Logan, W.Va.
GS—H. S. Gay, Jr., " "
PA—H. S. Gay, Jr., " "
MS—F. C. Killerman..Logan, W. Va.
EE—D. Musick, " "
EM—W. C. McCall, " "
S of H—3 elec., 1 steam loco. and mules; track gauge 32 in.
S of M—6 Elec. mach.
PP—1 Return tubular boilers, 150 H. P., gen. units, 275 volts D. C. 1—150 K. W. A. C. rotary converter.
EMP—200. Last fiscal year output 158,000 tons.
Sales agency, Hutchison Coal Co., Fairmont, W. Va., and Smokeless Fuel Co., Cincinnati, O.

GAYMONT COAL CO.
General Office, Charleston, W. Va.
Gaymont Mine; Drift, Sewell Seam, 34 in. thick.
PO—Elmo, W. Va.; SP—Same and Hawk's Nest, W. Va.; CTY—Fayette; RR—C. & O.
PR—Thos. C. Beury..Charleston, W.Va.
TR—John P. Vaughan, " "
GM—C. A. Brockman, " "
PA—C. A. Brockman, " "
GS—C. A. Brockman, " "
EM—S. H. Bridge, Quinnamont, W. Va.
S of H—Mules. Track gauge 30 in.
S of M—Hand.
PP—Buy power.
EMP—10. Developing.
Sales Agency, West Virginia Coal Co Richland, Va.

GEORGES CREEK COAL CO.
General Office, Cumberland, Md.
Drift Mine, Winifrede Seam, 52 to 110 in. thick.
PO—Ethel, W. Va.; SP—Same; CTY—Logan; RR—C. & O., Guyan Valley Br.
PR—Harry E. Weber, Cumberland, Md.
TR—Robert L. Stallings, " "
GM—W. F. Coale, " "
GS—John R. Hamilton..Lonaconing, Md.
PA—John R. Hamilton, " "
EM—G. S. Phillips......Ethel, W. Va.
MS—G. S. Phillips, " "
SCO—Address the Company. Buyer, J.

(Continued on Next Page)

Georges Creek Coal Co. (The)—Cont.
A. Bateman, Ethel, W. Va.
S of H—1 elec. loco., mules, and 1 storage battery loco. Track gauge 44 in.
S of M—4 elec. mach.
PP—2 water tube boilers, gen. unit, 550 volts D. C., 1 air comp., and 3 pumps.
EMP—100. Last fiscal year output 80,000 tons.

GILLIAM COAL & COKE CO.
Gilliam Mine, Drift, No. 3 Pocahontas Seam, 6 ft. thick.
PO—Gilliam, W. Va. SP—Northfork, W. Va.; CTY—McDowell.; RR—N. & W., Northfork Branch.
PR—Jas. R. Gilliam......Lynchburg, Va.
TR—L. A. Payne, " "
GM—Morris Watts, Eckman, W. Va.
EE—G. H. Finks, Gilliam, W. Va.
SM—G. W. Jones, Gilliam, W. Va.
S of H—5 Elec. loco.
S of M—1 Elec mach.
EMP—270 Coke ovens, 217 Bee Hive.

GILMER CONSOLIDATED COAL CO.
General Office, Gilmer, W. Va.
PR—Louis Bennett, Weston, W. Va.
TR—F. Earnest Brackett, Cumberland, Md.
GM—W. G. Colborn, Gilmer, W. Va.
PA—N. J. Amick, " " "
CE—G. J. Alstetter, Clarksburg, W. Va.
EM—G. J. Alstetter, " " "

Brackett Mines, Slope, Pittsburgh No. 8 Seam 5 to 7 ft. thick.
PO—Gilmer, W. Va., SP—Same, CTY—Gilmer. RR—C. & C., Gilmer, W. Va.
GS—D. D. Hennings....Gilmer, W.Va.
SM—N. J. Amick, Gilmer, W. Va.
S of H—Mules.
S of M—2 Elec. machines.
PP—1 Gen. unit 250 volts D. C. Buy power.
EMP—35. Last fiscal year output 40,000 tons.

Braxton Mine, Drift, Pittsburgh Seam No. 8, 5 to 9 ft. thick|
PO—Braxton, W. Va. SP—Cutlip Siding, W. Va., CTY—Gilmer. RR—C. & C. Braxton, W. Va.
GS—F. Murphy.
SM—C. E. Crosby, Braxton, W. Va.
S of H—Mules.
S of M—3 elec. machines.
EMP—30. Last fiscal year output, 48,000 tons.

GILMER FUEL CO.
General Office, Cincinnati, O.
Drift Mine, Pgh. Seam, 84 in. thick.
PO—Gilmer, W. Va.; SP—Same; CTY—Gilmer; RR—C. & C.
PR—D. H. Gayle........Cincinnati, O.
GM—D. H. Gayle, " "
TR—R. J. Kroger, " "
MS—W. Mathena, " "
CE—A. J. Alstetter..Clarksburg, W.Va.
S of H—Mules.
S of M—8 Comp. air mach.
PP—2 Boilers, total 300 H. P.; 1 compressor.
EMP—80. Last fiscal year output 100,000 tons.
Sales Agency, Kroger-Gayle Coal Co., Cincinnati, O.

GLADE RUN COAL & COKE COMPANY
General Office, Bloomington, Md.
Florence Mine; Drift; Kittanning Seam; 42 to 48 in. thick.
PO—Schell, W. Va.; SP—Florence, W. Va.; CTY—Mineral; RR—W. M.
PR—Carroll Pattison..Bloomington, Md.
GM—Carroll Pattison, " "
PA—Carroll Pattison, " "
TR—Charles H. Quigley,
Stephen Girard Bldg., Phila., Pa.
MS—G. H. Rowlings....Schell, W. Va.
S of H—Mules.

GLEASON COAL & COKE CO.
General Office, Frostburg, Md.
Gleason No. 1 Mine, Drift, Lower Kittanning Seam, 6 to 7½ ft. thick.
PO—Gleason, W. Va., SP—Same; CTY—Mineral RR—Western Maryland, W. Va. Div.
PR—Philip Brown .... Frostburg, Md.
TR—James A. Brown, " "
GM—Philip Brown, " "
GS—Philip Brown, " "
PA—James A. Brown, " "
CE—William Harvey, " "
EM—William Harvey, " "
MM—Samuel Whorrel, Gleason. W. Va.
EE—Samuel Whorrel, " " "
MS—Joseph F. Brown, " " "
SCO—Gleason Supply Co. Buyer, F. A. Healy, Gleason, W. Va.
S of H—Mules and 2 elec. loco. Track gauge 42 in.
S of M—3 Elec. machines.
PP—2 Erie City return tubular boilers, total 175 H. P. 2 Gen. units, 250 volts D. C., 2 pumps.
EMP—85. Last fiscal year output 93,462.7 tons.

GLEN ALUM COAL CO.
Mines Nos. 1, 2, 3 and no plant. Drifts.
PO—Glen Alum, W. Va.; SP—Light, W. Va. (Prepay); CTY—Mingo; RR—N. & W.
PR—J. R. Gilliam,.....Lynchburg, Va.
TR—D. A. Payne, " "
GM—Morris Watts,...Eckman, W. Va.
PA—W. A. Finx,...Glen Alum, W. Va.
MS—J. W. Yost, " "
EM—C. J. Bortels, " "
SM—J. T. Ward, " "
S of H—15 elec. loco.
S of M—14 elec. mach.
PP—6 boilers, total 900 H. P., 3 gen. units 250 volts D. C., 2200 A. C., 3 phase, 60 cycles.
EMP—450. Last fiscal year output 355,342 tons.
Sales Agent, Glen Alum Fuel Co.

GLENDALE COAL CO.
Glendale Mine, Shaft, Pittsburgh No. 8 Seam, 5 ft. 8 in. thick.
PO—Glendale, W. Va. SP—Same. CTY—Marshall, RR—B. & O.
PR—E. T. Hitchman..Wheeling, W. Va.
TR—W. H. Koch, .. Glendale, W. Va.
GM—W. H. Koch, " " "
PA—W. H. Koch, " " "
GS—E. C. Pickett, " " "
MM—T. I. Thomas, " " "
SCO—Western Supply Co. Glendale, W. Va.

S of H—Mules; 1 elec. loco. Track gauge, 35 in.
S of M—6 Elec. machines.
PP—3 Phoenix and Erie return tubular boilers, total 450 H. P. 3 Gen. units, 250 volts D. C.
EMP—150. Last fiscal year output, 88,907 tons. Sales agents, E. A. Upstill & Co., Cleveland, Ohio.

GLENDALE COLLIERY CO.
Out of business.

GODFREY COAL CO.
Cephus Mine, Drift, Poca. No. 3 Seam.
PO—Montcalm, W. Va.; SP—Godfrey, W. Va.; CTY—Mercer; RR—N. & W.; Cane Creek Br.
PR—H. A. Ritz......Bluefield, W.Va.
TR—C. N. Williams, Jr...Richmond, Va.
GM—C. N. Williams, Jr., " "
MS—E. V. Neal....Montcalm, W. Va.
S of H—Mules.
S of M—Hand.
EMP—30.
Sales Agency, Castner, Curran & Bullitt.

GORMAN COAL & COKE CO.
General Office, Baltimore, Md.
Gorman Nos. 1 and 2 Mines, Drifts, Upper Freeport Seam, 4 to 5½ ft. thick.
PO—Austen, W. Va. SP—Same. CTY—Preston. RR—B. & O.
PR—Douglas Gorman....Baltimore, Md.
TR—J. W. McMillan, Baltimore, Md.
PA—R. G. Broome, " "
EM—J. A. Smith, Albert, W. Va.
MS—Thos. Murphy, Austen, W. Va.
SCO—West End Supply Co., Austen, W. Va. Buyer,, Leo Littman, Austen, W. Va.
S of H—Mules. Track gauge, 42 in.
S of M—Hand and 4 comp. air machines.
PP—1 return tubular 150 H. P. boiler, 1 air compressor.
EMP—125. ·Last fiscal year output 14,000 tons. 40 Bee Hive coke ovens.

GRAFTON COAL & COKE CO.
Sandlick Mine, Drift, Pgh. Seam.
PO—Grafton, W. Va. SP—Flemington, W. Va. CTY—Taylor. RR—C. & O.
GM—E. J. Fahey ....Grafton, W.Va.
PA—E. J. Fahey, " "
MS—John McGraw, " "
SM—Thos. Walsh, " "
S of H—Mules.
S of M—Hand.

GRAFTON FUEL CO.
Lillian Mine; Drift; Up. Freeport Seam, 74 in. thick.
PO—Grafton, W. Va.; CTY—Barbour; RR—G. & B.
GM—L. B. Brydon....Grafton, W.Va.
S of M—3 Elec. mach.
EMP—28. Last fiscal year output, 44,778 tons.

GRAHAM, W. W.
General Office, Charleston, W. Va.
Graham Mine, Drift, Masontown Seam, 56 to 60 in. thick.
PO—Big Chimney, W. Va. SP—Bream, W. Va. CTY—Kanawha. RR—Coal & Coke Ry.
PA—W. W. Graham, Charleston, W. Va.
EM—John S. Cole, Charleston, W. Va.
MS—Z. L. Huffam..Big Chimney, W.Va.
SM—W. W. Graham, Big Chimney, W. Va.
S of H—Mules. Track gauge 42 in.
S of M—Pick.
PP—2 Return tubular boilers, total 120 H. P., 2 pumps.
EMP—50. Last fiscal year output, 25,000 tons.

GREAT SCOTT COAL & COKE CO. (THE)
Great Scott Mine, Drift, Pittsburgh Seam, 108 in. thick.
PO—Morgantown, W. Va. SP — Star City, W. Va. CTY—Monongahela. RR—B. & O., F. M. & P. Branch.
PR—Alex H. Tait, Morgantown, W. Va. Va.
TR—D. C. Hoffman, " "
GM—Alex H. Tait, " "
PA—Alex. H. Tait, " "
GS—A. Gordon Tait, " "
CE—A. Gordon Tait, " "
S of H—Mules and aerial tramway. Track gauge 42 in.
S of M—Pick.
EMP—10.

GREEN, W H.,
Williette No. 3 Mine; Drift; Kittanning Seam; 8 ft. thick.
PO—Weaver, W. Va. SP—Same. CTY Randolph. RR—W. M.
PR—W. H. Green, ..Weaver, W. Va.
GM—W. H. Green, " " "
PA—W. H. Green, " " "
S of H—Mules. Track gauge 42 in.
S of M—Hand.
Note—Will start shipping coal July 1st, 1916.

GREENBRIER COAL & COKE CO.
Greenbrier Mine, Drift; Pocahontas No. 3 Seam 5 to 6 ft. 3 in. thick. Operate Washery.
PO—McDowell, W. Va. SP—Crumpler, W. Va. CTY—McDowell. RR—N. & W., Norfolk Branch.
PR—Isaac T. Mann, Bramwell, W. Va.
TR—Jairus Collins,...McDowell, W. Va.
GM—Jairus Collins, " "
PA—Jairus Collins, " "
EM—R. J. Gould.....Goodwill, W. Va.
MS—W. H. Saunders, McDowell, W. Va.
SM—J. E. Smith, McDowell, W. Va.
S of H—4 Elec. loco. Track gauge 56 in.
S of M—Hand and 3 elec. mach.
PP—3 Water tube, Erie City boilers, total 375 H. P., 3 Gen. units, 250 volts D. C., 3 pumps. Power plant not in use. Purchase power.
EMP—250. 200 Bee Hive Coke Ovens. Last fiscal year output 193,000 tons. Sales agent, Smokeless Fuel Co., Cincinnati, O.

GREENWOOD COAL CO.
Greenwood Mine; Drift, Fire Creek Seam, 48 in. thick.
PO—Lawton, W. Va.; SP—Brownwood, W. Va.; CTY—Fayette; RR—C. & O.; Lauel Creek Br.
PR—George Lawton......Lawton, W.Va.
TR—George Lawton, " "
GM—W. A. Brown, " "
GS—W. A. Brown, " "
PA—W. A. Brown, " "
MS—H. C. Peters and Beck Hurt, Lawton, W.Va.
S of H—5 Elec., 2 steam loco.
S of M—1 Elec. mach.
PP—Power purchased.
Coke ovens 50 Bee Hive.

GREY EAGLE COAL CO.
Grey Eagle Mine, Shaft, No. 2 Gas Seam, 58 to 65 in. thick.
PO—Armor, W. Va.; (Express office, Kermit, W. Va.); CTY—Mingo; RR—N. & W.
PR—S. W. Perry.......Armor, W. Va.
GM—S. W. Perry, " "
PA—S. W. Perry, " "
TR—A. J. Perry, Jr., " "
EE—Geo. Noble, " "
EM—D. M. Good....Williamson, W.Va.
S of H—1 Elec. loco. and mules; track gauge 48 in.
S of M—3 Elec. mach.
PP—2 H. S. & G. return tubular boilers, total 200 H. P., 1 gen. unit 250 volts D. C., 2 pumps.
EMP—65. Last fiscal year output 51,000 tons.
Sales Agency, Blue Ash Coal Co., Cincinnati, O.

GULF COAL CO.
General Office, Tams, W. Va.
Gulf Nos. 1, 2 and 3, Drifts, Beckley Seam, 4 ft. to 6¼ ft. thick.
PO—Hotcoal, W. Va. SP—Same. CTY—Raleigh. RR—Virginia, Winding Gulf Branch.
PR—J. O. Watts..........Tams, W.Va.
TR—J. O. Watts, " "
GM—W. P. Tams, Jr., " " "
PA—W. P. Tams, Jr., " "
GS—J. W. Wilson, " "
EM—J. W. Wilson, " "
SCO—Buyer, J. P. Kelly, Tams, W. Va.
S of H—Mules and 2 elec. loco. Track gauge 56½ and 44 in.
S of M—Hand and 2 elec. mach.
PP—2 Brownell return tubular boilers, total 300 H. P. 1 Gen. unit 250 volts D. C. 3 pumps.
EMP—75. Last fiscal year output, 122,000 tons.

GULF SMOKELESS COAL CO.
Tams Mine, Drift, Beckley Seam.
PO—Tams, W. Va. SP—Same. CTY—Raleigh. RR—Vir., C. & O.
GM—W. P. Tams, Jr...Tams, W.Va.,
PA—W. P. Tams, Jr., " "
EM—K. McWhorter, " "
MS—John Hancock, " "
EE—F. Vandervolgen, " "
S of H—Elec. loco.
S of M—Hand and elec. mach.
PP—2 gen. units, one 200 KW., one 300 KW., 250 volts D. C., 4 boilers, total 600 H. P.
EMP—450.

GUYAN VALLEY COAL COMPANY
Summers Mine; Drift; Eagle Seam; 84 to 90 in. thick.
PO—Crown, W. Va.; SP—Lax, "Prepay"; CTY—Logan; RR—C. & O., Guyan branch.
PR—W. R. Thurmond....Crown, W. Va.
TR—A. D. Callihan, " "
GM—A. D. Callihan, " "
GS—A. D. Callihan, " "
PA—A. D. Callihan, " "
MS—J. B. Watson, " "
EM—C. W. Dawson,...Accoville, W. Va.
SCO—Cook and Perry...Crown, W. Va.
S of H—Mules. Track gauge 44 in.
S of M—1 elec. loco.
PP—1 return tubular boiler, total 50 H. P., 35 K. W., 250 volts A. C.
EMP—28. Last fiscal year output 35,000 tons.
Successors to H. B. Summers Coal Co.

GUYANDOTTE COAL CO.
Guyandotte Mine, Drift, No. 2 Gas Seam, 44 to 60 in. thick.
PO—Kitchen, W. Va.; SP—Same, CTY—Logan; RR—C. & O., Guyan Valley Br.
PR—Captain F. T. Lee..Lynchburg, Va.
TR—Richard Hancock, " "
PA—Chris MacTaggart..Kitchen, W.Va.
EM—Chris MacTaggart, " "
MS—Chris MacTaggart, " "
SCO—Address the Company, " "
S of H—1 Elec. loco. and mules; track gauge 48 in.
S of M—1 Elec., 4 comp. air mach.
PP—Return tubular boiler, 150 H. P., 1 compressor; power purchased.
EMP—60. Last fiscal year output 40,582 tons.
Sales Agency, The John T. Hesser Co.

HACKETT COAL CO.
Hackett Mine; Drift; Seam No. 5 Block, 48 to 78 in. thick.
PO—Cedar Grove, W.Va.; SP—Same; CTY—Kanawha; RR—K. & M., Main Line.
PR—Sam'l Hackett, Cedar Grove, W.Va.
GM—Sam'l Hackett, " " "
GS—Sam'l Hackett, " " "
PA—Floyd Hackett, " " "
MS—Wilson Broderick, " " "
EM—Wm. M. Chapman, East Bank, W. Va.
SCO—Gertrude Hackett, buyer, Cedar Grove, W. Va.
S of H—Mules; track gauge 36 in.
S of M—Hand.
EMP—28. Coke ovens 15 (not operating).
Note—Output 100 tons per day, developing for 400 tons per day.

HAMILL COAL & COKE CO.
Hamill Mine; Kittanning Seam. 54 to 60 in. thick.
PO—Blaine, W. Va. SP—Same. CTY—Mineral. RR—Western Maryland.
PR—M. M. Brown........Blaine, W.Va.
TR—R. A. Smith, , " " "
GM—R. A. Smith, " " "
GS—R. A. Smith, " " "
PA—F. G. Trout, " " "
EM—V. G. Pew, " "
SCO—Hamill Coal & Coke Co. Buyer, F. G. Trout, Blaine, W. Va.
S of H—Mules. Track gauge 42 in.
S of M—Hand.
EMP—90. Last fiscal year optput 86,000 tons.

HALL, JOHN D.
General Office Warwood., W. Va.
Edgewood Mine; Drift; No. 8 Seam; 66 in. thick.
PO—Warwood, W. Va.; SP—Same; CTY—Ohio.
GM—John D. Hall, Warwood, W. Va.
MS—John D. Hall " "
S of H—Mules, track gauge 34 in.
S of M—1 elec. chain mach.
PP—Purchase power.
EMP—7.

HARRIS', O. D. SONS COAL COMPANY.
PR—O. D. Harris, ..Emoryville, W.VA;
TR—O. D. Harris, " "
GM—M. E. Harris, " "
GS—W. W. Harris, " "
MS—W. W. Harris, " "

Emory No. 1 Mine; Drift; Bakertown Seam; 21 to 42 in. thick.
PO—Emoryville, W. Va. SP—Same CTY—Mineral; RR—W. Md., Elk Garden branch.
S of H—Mules.
S of M—Hand.

Emory No. 2 Mine; Drift; Bakertown Seam; 21 to 42 in. thick.
PO—Emoryville, W. Va; SP—Same; CTY—Mineral; RR—W. Md., Elk Garden branch.
S of H—Mule.
S o. M—Hand.
PP—2 pumps.
EMP—6. Last fiscal year output, 2189 tons.
Note—Successors to Emory Run Coal Company.

HARRISON COAL CO.
Smith Mine, Drift, Pgh. Seam, 7 to 8 ft. thick.
PO—Rosemont, W. Va. SP—Same. CTY—Taylor. RR—B. & O.
PR—David O. Smith.Rosemont, W. Va.
TR—R. H. Philson....Meyersdale, Pa.
GM—C. G. Smith, " "
PA—H. G. Smith.....Rosemont, W. Va.
MS—H. G. Smith, " "
SM—Miss V. M. Gibson, " "
S of H—Mules and gravity. Track gauge 42 in.
S of M—Hand.
EMP—40. Last fiscal year output 20,000 tons.

HARRISON, H. H.
Williette Mine No. 2 Drift; Kittanning Seam; 66 to 72 in. thick.
PO—Weaver, W. Va; SP—Same; CTY—Randolph; RR—W. M.
GM—H. H. Harrison, ..Weaver, W. Va.
GS—H. H. Harrison, " "
PA—H. H. Harrison, " "
MS—John Condry, " "
S of H—Mules.
EMP—22. 5 month's output, 9000 tons.
Note—Formerly operated by W. H. Green.

HARRY B., COAL CO.
General Office, Fairmont, W. Va.
Harry, Junior Mines, Nos. 2, 8 and 4, Drifts, Pittsburgh Seam, 7 ft. thick
PO—Monongah, R. F. D. No. 8. SP—Everson, W. Va., (Prepay). CTY—Marion RR—Kilarm Branch, B. & O.
PR—Harry B. Clark, Fairmont, W. Va.
TR—C. H. Waggener, " " "
SEC—C. H. Waggener, " " "
GM—Harry B. Clark, " " "
GS—J. A. Clark, Jr., " " "
PA—J. A. Clark, Jr. " " "
SCO—Everson Supply Co., Monogah, W.Va.
S of H—Mules.
S of M—Hand.
EMP—90.

HARRY B COAL & COKE CO.
General Office, Fairmont, W. Va.
Pitcairn Mine; Drift, Pgh. Seam, 84 in. thick.
PO—Clarksburg, W. Va.; SP—Same; CTY—Harrison; RR—B. & O., W. V. & P. Div.
PR—C. H. Diffenderffer, Philadelphia, Pa.
TR—J. A. Clark....Fairmont, W.Va.
GM—Harry B. Clark, " "
GS—J. A. Clark, Jr., " "
PA—J. A. Clark, Jr., " "
EM—G. J. Altstetter, " "
MM—Homer Palmer..Clarksburg, W.Va.
EE—Homer Palmer, " "
S of H—1 Elec., 1 steam loco.
S of M—4 Elec. mach.
PP—3 Erie City, water tube boilers, total 300 H. P., 1 200 K. W., gen. unit 250 volts D. C., 2 pumps.
EMP—150. Last fiscal year output 200,000 tons.
Sales Agents, Blair-Parke C. & C. Co., Philadelphia, Pa., and Jess Strathmore & Co., Clarksburg, W. Va.

HARTLAND COLLIERY COMPANY
General Office, Clay, W. Va.
Drift Mine; Winifred, Coalburg & No. 5 Kanawha Block Seams; 48 to 130 in. thick.
PO—Clay, W. Va.; SP—Middle Creek, W. Va.; CTY—Clay; RR—Coal & Coke.
PR—John B. Hart, Clarksburg, W. Va.
TR—John B. Hart, " "
GM—M. McD. Price.....Clay, W. Va.
PA—M. McD. Price, " "

HARTY COAL CO.
Harty Mine; Drift; No. 3 Poca. Seam, 48 to 60 in. thick.
PO—Mullens, W. Va.; CTY—Wyoming; RR—Virginian.
PR—J. A. Wood, Sullivan, W. Va.
TR—J. C. Sullivan Mullens, W. Va.
PA—J. C. Sullivan, " " "
GS—J. C. Sullivan, " " "
CE—Philip Konrad, Kanawha Falls, W. Va.
PP—Power to be purchased.

HAYWOOD COAL MINING CO.
General Office, Buena Vista, Pa.
Monroe Mine; Drift; Pittsburgh Seam; 104 to 108 in. thick.
PO—Shinnstown, W. Va.; SP—Monroe Mine, W. Va.; CTY—Harrison; RR—B. & O., Monagah Div.
PR—G. H. Wisser, Shinnston, W. Va.
PA—G. H. Wisser....Shinnstown, W.Va.
TR—C. H. Wisser,.. McKeesport, Pa.
GM—C. H. Wisser. " "
MS—G. H. Wisser, Shinnston, W. Va.
EM—D. F. Tabbott...Fairmont, W. Va.
MM—E. C. Wisser....Shinnston, W. Va.
EE—E. C. Wisser, Shinnston, " "
SCO—Haywood Coal Mng. Co. Buyer, C H. Vincent, Shinnston, W. Va.
SM—C. H. Vincent. " " "
S of H—Mules and 1 gasoline motor. track gauge 42 in.
S of M—4 Elec. machines.
PP—2 pumps. Power furnished.
EMP—50. Last fiscal year output 31,500 tons.

HEMLOCK HOLLOW COAL & COKE CO.
Hemlock Hollow Mine. Drift. Fire Creek seam, 3 ft. 10 in| thick.
PO—Lawton, W. Va. SP—Layland, W. Va. CTY—Fayette. RR—C. & O.
PR—J. L. Pritchard, Charleston, W.Va.
TR—W. A. Brown, Lawton, " "
GM—W. A. Brown, " " "
GS—J. A. Brown. " " "
PA—J. A. Brown. " " "
EM—S. N. Bridge..Quinnimont, W. Va.
EE—J. Merritt, Lawton. " "
SCO—Hemlock Hollow Store, buyer, H. H. Brown, Lawton, W. Va.
S of H—6 Elec. loco. Track gauge 44 in
S of M—Hand and 5 elec. mach.
PP—Power purchased. Sales agency, New River Consolidated Co., Thurmond, W. Va.
EMP—60. Last fiscal year output 54,540 tons.

HENRIETTA-POCAHONTAS COAL CO.
Henrietta Mine.
PO—Bartley, W. Va.
No report.

HICKORY ASH COAL CO. (THE)
General Office, Wellston, Ohio.
"Hickory Ash," Mine, Drift, Kanawha No. 2 Gas Seam, 4 to 6 ft. thick
PO—Sterling, W. Va.. SP—Same, CTY—Boone RR—C. & O., Coal River Div.
PR—F. A. Carraci......Wellston, O.
TR—Frank Morrow, " "
GM—H. A. Goddard, " "
GS—Grant McGhee .. Sterling, W. Va.
PA—Grant McGhee, " "
EE—Jas. Beard, " "
SCO—The Hickory Ash Coal Co., Buyer, Chas Wilson, Sterling, W. Va.
S of H—4 Elec. loco., standard gauge track.
S of M—6 Elec. machines.
PP—4 Return tubular boilers, total 200 H. P., 220 volts D. C.
EMP—150. Last fiscal year output 60,000 tons.
Sales agent, F. A. Carraci, Wellston, Ohio.

HIORRA COKE CO.
General Office, Uniontown, Pa.
Vulcan Mine, Drift, Upper Freeport Seam, 52 inches thick
PO—Hiorra, W. Va., SP—Same, CTY—Preston. RR—B.&O.
PR—W. A. Stone,....Uniontown, Pa.
GM—W. A. Stone, " "
PA—Geo. H. Bortz, " "
MS—Geo. L. Humphreys, Hiorra,W.Va.
S of H—Mules for gathering, and 1 elec. loco., track gauge 42 in.
S of M—Hand and 6 comp. air mach.
PP—1 Return tubular 150 H. P. boiler, 1 air comp., also buy elec. power. 100 Bee Hive coke ovens.
Last fiscal year output 52,350 tons. Sales agency, W. A. Stone & Co., Uniontown, Pa.

HITCHMAN COAL & COKE CO.
General Office, Wheeling, W. Va.
Hitchman Mine, Slope, Pittsburgh No. 8 Seam, 5 ft. 8 in. thick.
PO—Benwood, W.V., SP—Same, CTY—Marshall. RR—B.&O.
PR—E. T. Hitchman..Wheeling, W. Va.
TR—W. H. Koch, " "
GM—W. H. Koch, " "
PA—W. H. Koch, " "
GS—E. C. Pickett, " "
MM—T I. Thomas, " "
EE—T I. Thomas " "
SCO—Western Supply Co., " "
S of H—Mules, rope and 7 elec loco. track gauge 42 in.
S of M—15 Elec. machines.
PP—2 Keeler water tube boilers, and 3 Phoenix return tubular boilers,, total 600 H. P., 3 gen. units 250 volts D. C., 2 pumps.
EMP—450. Last fiscal year output 382,741 tons. Sales agents, E. A. Upstill & Co., Cleveland, O.

HITE COAL & COKE CO.
See Horchler Coal Mining Co.

HORCHLER COAL MINING COMPANY
Frederick Mine; Drift; Upper Freeport Seam; 54 in. thick.
PO—Austen, W. Va.; SP—Hiorra, W. Va. CTY—Preston; RR—B. & O., Raccoon Valley branch.
GM—F. N. Horchler.....Austen, W. Va.
PA—F. N. Horchler, " "
MS—F. N. Horchler, Jr. " "
S of H—Mules.
S of M—Hand
PP—Purchase power.
EMP—24.
Note—Formerly Dixie Mine of the Hite Coal & Coke Company..

HORSE CREEK BLOCK COAL CO.
General Office, Columbus, O.
No. 1 Mine; Drift; Kanawha No. 5 Seam, 52 to 56 in. thick.
PO—Morrisvale, W. Va.; SP—Same; CTY—Boone; RR—C. & O., Coal River branch.
PR—C. W. Thompson....Columbus, O.
TR—Edwin F. McManigal, " "
GM—P. C. Morris......Nelsonville, O.
GS—P. C. Morris, " "
EM—J. L. Murphy, " "
MM—P. B. Verity, " "
PA—Chas. Milligan..Morrisvale, W. Va.
MS—Chas. Milligan, " "
SCO—Address the Company, " "
S of H—1 Elec. loco.
S of M—2 Elec. mach.
PP—1 Return tubular boilers, total 150 H. P., gen. unit 250 volts D. C., 1 pump.
EMP—40.
Sales Agency, New York Coal Co., Columbus, O.

HOUSTON COAL & COKE CO.
General Office, Elkhorn, W. Va.
Houston Mine; Drift; Pocahontas No. 3 Seam, 102 in. thick.
PO—Elkhorn, W. Va., SP—Same, CTY McDowell; RR—N. & W.
PR—T. E. Houston....Cincinnati. O.
TR—T. E. Houston.......Cincinnati, O.
GM—T. E. Houston, " "
GS—Benjamin Lewis..Elkhorn, W.Va.
..MS—E. L. Stafford, " "
PA—W. H. Franklin, " "
EM—R. W. Austin, " "
MM—W. J. Stone, " "
CE—John M. Lewis, " "
EE—W J. Stone " "
SCO—Address the company. Buyer, G. E. Matthews, Elkhorn, W. Va.
S of H—Mules and 4 elec. loco. Track gauge 44 in.
S of M—Hand.
PP—3 Berry and 3 Erie City return tubular boilers, total 1200 H. P., 2 gen. units, 250 volts D. C.
EMP—400. 230 Bee Hive coke ovens.
Sales agency, Houston Coal Co., 1522 Union Trust building, Cincinnati, Ohio.

HOUSTON COLLIERIES CO.
General Office Union Trust Bldg., Cincinnati, O.
Huger Mine; Shaft No. 4 Pocahontas Seam, 36 to 78 in. thick.
PO—Maitland, W. Va.; SP—Same; CTY—McDowell; RR—N. & W.
PR—T. E. Houston.....Cincinnati, O.
GM—T. E. Houston, " "
TR—N. H. Franklin, " "
GS—Benjamin Lewis..Elkhorn, W. Va.
PA—W. W. Wood....Maitland, W. Va.
SUPT—W. W. Wood, " "
EM—R. W. Austin....Elkhorn, W. Va.
MM—E. L. Knight...Maitland, W. Va.
EE—E. W. Knight, " "
SCO—Houston Collieries Co. Buyer, T. C. Stafford, Maitland, W. Va.
S of H—13 elec. locos.
S of M—4 elec. mach.
PP—4 return tubular boilers, total 600 H. P., 3 gen. units, 230 volts D. C., 3 pumps, 1 air comp.
EMP—200. Last fiscal year output 200,000 tons. 150 Bee Hive Coke Ovens.

HOWARD COLLIERY CO.
PR—F. L. Schoew..Chattaroy, W.Va.
GM—F. L. Schoew, " "
TR—W. S. Estler, " "
GS—W. S. Estler, " "
MS—W. S. Esther, " "
PA—F. W. Burmeister, " "
EM—F. E. Strohmeier. " "
EE—H. V. Ingham, " "
SCO—Howard Store, " "
Buyer, F. W. Burmeister, Chattaroy, W. Va.

Howard Colliery; Drift; Winifrede Seam; 60 to 84 in. thick. Operate washery.
PO—Chattaroy, W.Va., SP—Same, CTY—Mingo. RR—N.& W.
S of H—1 elec. and 1 steam loco. Track gauge 48 in.
S of M—3 elec. mach.
PP—Rotary converter, 2300 volts A. C., 250 volts D. C., 3 phase, 60 cycle, 4 pumps. Purchase power.
EMP—115. Last fiscal year output 100,000 tons.

Frederick Mine; Drift; Winifrede Seam; 66 to 72 in. thick.
PO—Chattaroy, W. Va.; SP—Same; CTY—Mingo; RR—N. & W.
SM—F. L. Schaew....Chattaroy, W. Va.
S of H—1 steam loco., Comp. air loco. and mules. Track gauge 48 in.
S of M—Hand.
PP—2 return tubular boilers, total 225 H. P., 1 air comp., 3 pumps.
EMP—95. Last fiscal year output 73,000 tons.
Sales agents, Hinsch-Briscoe Coal Co., Cincinnati, Ohio.

HOWARD JUNIOR COAL CO.
Howard Junior Mine; Drift; Winifrede Seam, 54 to 72 in. thick. Operate washery.
PO—Chattaroy, W.Va., SP—Same, CTY—Mingo. RR—N. & W.
PR—F. L. Schoew..Chattaroy, W.Va.
TR—W. S. Estler, " "
GS—W. S. Estler, " "
MS—W. S. Estler, " "
PA—F. W. Burmeister, " "
EE—H. V. Ingham, " "
GM—F. L. Schoew, " "
Asst Supt—H. S. Schoew, " "
EM—F. E. Strohmeier, " "
SCO—Howard Store, Buyer, Fred W. Burmiester, Chattaroy, W.Va.
S of H—Mules and 2 elec. loco. Track guage 48 in.
S of M—4 elec. mach.
PP—2 Ames upright boilers, 2 Phoenix return tubular boilers, total 400 H. P., 2300 volts A. C., 250 D. C., 3 phase, 60 cycle, 4 pumps. Purchase power.
EMP—95. Last fiscal year output 93,000 tons.
Sales agents, Hinsch-Briscoe Coal Co. Cincinnati, Ohio.

HUDDLESTON COAL & COKE CO.
See Virginia Buffalo Coal Co.

HUMPHREYS COAL CO.
Humphreys No. 1 Mine; Drift; Upper Freeport Seam; 48 to 60 in. thick.
PO—Philippi, W. Va .;SP—Same; CTY—Barbour; RR—B. & O.
PR—D. P. Stanton, 1 Broadway, N. Y.
GM—Arthur Appleyard..Philippi, W. Va.
GS—Arthur Appleyard, " "
PA—G. T. Wheaton...Philadelphia, Pa.
MS—J. M. Swick.....Philippi, W. Va.
CE—J. B. Jones.......Johnstown, Pa.
EM—J. B. Jones, " "
EE—Jas. McCann......Philippi, W. Va.
S of H— elec. loco. Track gauge 36 in.
S of M—2 elec. mach.
PP—2 return tubular boilers, total 200 H. P., 1 gen. unit, 250 volts D. C.
EMP—45. Last fiscal year output 60,000 tons.

HUTCHINSON COAL CO.
General Office, Fairmont, W. Va.
8 mines in West Virginia, 1 Mine in Ohio.
PR—M.L.Hutchinson, Fairmont, W.Va.
TR—C. H. Jenkins, " "
GM—C. H. Jenkins, " "
GS—C. J. Ryan, Fairmont, W. Va.
PA—M. C. Lough, " "
EM—Bruce Bailey, " "

Hutchinson Mine, Drift, Pittsburgh Seam 5 to 7½ ft. thick.
PO—Mt. Clare, W. Va., SP—Byron, W. Va., CTY—Harrison. RR—B.&O., W.Va. & Pgh. Br.
MS—C. L. Lutton .. Mt. Clare, W.Va.
SM—W. G. H. Crawford, " "
S of H—Mules and 2 Elec. loco.; track gauge 42 in.
S of M—4 Elec. and 6 comp. air mach.
PP—3 Return tubular boilers, total 450 H. P. 250 volts D. C., 1 Air comp. and 4 pumps.
EMP—191. Coke ovens, 20 Bee Hive. Last fiscal year output 275,812

Erie Mine, Drift, Pittsburgh Seam, 6 to 8½ ft. thick.
PO—Hepzibah, W. Va. SP—Erie Mine, W. Va., CTY—Harrison. RR—B. & O., W. Va. Short Line.
MS—P. F. Cogan....Hepzibah, W. Va.
SM—G. C. Coffman, " "
S of H—Mules, and 1 elec. loco., track gauge 42 in.
S of M—4 Elec. and 6 comp. air mach

(Continued on Next Page)

Hutchinson Coal Co.—Cont.
PP—4 Return tubular boilers, total 460 H. P., 350 volts D. C., 1 air compressor.
EMP—156. Last fiscal year output 200,972 tons.

Linden Mine, Drift, Pittsburgh Seam, 4½ to 5 ft. thick.
PO—Mason, W. Va., SP—Linden Mine, W.Va., CTY—Mason. RR—B.& O., Ohio River Div.
MS—Jacob Phillips....Mason, W.Va.
SM—J. E. Jividen, " "
S of H—Mules and 2 elec. loco., track gauge 38½ in.
S of M—4 Elec. machines.
PP—2 return tubular boilers, total 300 H. P., gen. units 250 volts D. C., 2 pumps.
EMP—152. Last fiscal year output 89,929 tons.

Florence Mine, Drift, Pittsburgh Seam, 4 to 6½ ft. thick.
PO—Mt. Clare, W. Va., SP— Byron, W. Va., CTY—Harrison. RR— B. & O.
MS—Walter Miller....Mt. Clare,W.Va.
S of H—1 Elec. loco.; track gauge 42 in.
S of M—3 Elec. machines.
PP—500 volts D. C.
EMP—96. Last fiscal year output 105,019 tons.

McCandlish Mine, Drift, Pittsurgh Seam 6 to 8½ ft. thick.
PO—Meadowbrook, W. Va., SP—Same, CTY—Harrison. RR—B. & O., M. R. Div.
MS—John Reuter....Meadowbrook, W.Va
SM—J. H. McGee, " "
S of H—Mules and 2 elec. loco., track gauge 42 inches.
S of M—6 Elec. machines.
PP—3 Return tubular boilers, total 450 H. P., 250 volts D. C., 4 pumps
EMP—191. Last fiscal year output 252,037 tons.

Girard Mine, Drift, Pittsburgh Seam, 6½ to 8½ ft. thick.
PO—Dola, W. Va., SP—Same, CTY-Harrison. RR—B. & O., W. Va, Short Line.
MS—A. V. Morgan....Dola. W.Va
SM—John E. Cuff, " "
S of H—Mules and rope; track gauge 42 in.
S of M—5 Comp. air mach.
PP—1 return tubular boiler, 150 H P., 250 volts D.C., 1 air comp and 2 pumps.
EMP—90. Last fiscal year output 111,662 tons.

Delta and York Mines, Drifts, Pittsburgh Seam, 5½ to 7½ ft. thick
PO—Reynoldsville, W.Va., SP—Same, CTY—Harrison. RR—B. & O., Parkersburg Branch.
MS—Ward Malone, Reynoldsville, W.Va.
SM—P. H. Moore, " "
S of H—Mules and rope; track gauge 42 in.
S of M—Pick, and 5 comp. air mach.
PP—2 return tubular boilers, total 235 H. P., 250 volts D. C., 1 pump.
EMP—Delta 54; York 45. Last fiscal year output. Delta 47,247 tons; York 18,339 tons.

HYGRADE COAL COMPANY
General Office, Keyser, W. Va.
Page Mine; Drift; Redstone Seam; 66 to 96 in. thick.
PO—McWhorter, W. Va.; SP—Same; CTY—Harrison; RR—B. & O.
PR—H. L. Heintzelman, Fairmont, W.Va.
TR—E. A. Russell.......Keyser, W.Va.
PA—E. A. Russell, " "
MS—J. S. Klinefelter, McWhorter, W.Va.
MGR—J. S. Klinefelter, " "
EM—Lewis & Burrell....Grafton, W.Va.
S of H—Mules.
S of M—Hand.
EMP—30. Last fiscal year output, 40,000 tons.
Note—Have taken over mine formerly operated by J. S. Klinefelter & Co.

IMPERIAL COLLIERY CO.
Mines Nos. 1, 2 and 3, Drifts, Eagle Seam, 4 to 6½ ft. thick.
PO—Burnwell, W. Va., SP—Same, CTY—Kanawha. RR—C. & O.
PR—F. P. Christian,..Lynchburg, Va.
TR—O. H. Miller, " "
GM—Quin Morton......Burnwell, W.Va.
GS—F. H. Morton, " "
PA—F. H. Morton, " "
CE—R. B. Whitaker, Milburn W.Va.
EM—R. B. Whitaker, " "
EE—E. A. Hudson..Burnwell, W.Va.
SM—E. O. Settle, " "
S of H—6 Elec. loco., track gauge 44 inches.
S of M—8 Elec. and 6 comp. air mach.
PP—3 Water tube boilers, total 450 H. P., 1 Air comp.
EMP—300. Last fiscal year output 180,000 tons. ,
Sales agent, Imperial Coal Sales Co., Quin Morton, Mgr., Burnwell, W. Va.

INDEPENDENCE COAL COMPANY
General Office. Commercial Trust Bldg., Philadelphia, Pa.
Late No. 1 Mine; Slope; Kittanning Seam 48 to 66 in. thick.
PO—Independence, W. Va.; SP—Hardman; CTY—Preston; RR—B. & O.
PR—John Clark......Philadelphia, Pa.
TR—G. S. Hampton, " "
GS—Gordon B. Late...Newburg, W. Va.
MS—Gordon B. Late, " "
MM—Travis B. Chedester, Independence, W. Va.
SCO—Independence Coal Co. Store. Buyer, Jos. Van Zandt, Independence, W. Va.
S of H—Rope and 1 steam loco.
S of M—Hand.
PP—2 return tubular boilers, total 140 H. P., 1 gen. unit, 1 pump.
EMP—50. Last fiscal year output 20,000 tons.
Note—Formerly operated by the Gordon B. Late Coal Company.

IROQUOIS COAL MINING COMPANY
Iroquois Mine; 48 in thick.
PO—Tomrey, W. va.; SP—Iroquois, W. Va.; CTY—Wyoming; RR—Virginian, Gulf Br.
PR—A. W. Reynolds, Princeton, W. Va.
TR—W. H. Thomas, Bramwell, W. Va.
GM—W. H. Thomas, " "
GS—W. H. Ruby,......Tomrey, W. Va.
PA—W. H. Ruby, " "
SM—W. H. Love, " "
CE—Eugene Powell..Springton, W. Va.
S of H—3 elec. locos. Track gauge 48 in.
S of M—3 elec. mach.
PP—Purchase power.
EMP—50.

ISLAND CREEK COAL CO.
General Office, Holden, W. Va.
PR—T. B. Davis, 1 Broadway, New York.
TR—F. W. Batchelder, Boston, Mass.
GM—A. R. Beisel......Holden, W. Va.
Gen Supt—W. O. Percival, Holden, W.Va.
PA—W. T. Smythe, Huntington, W. Va.
EM—J. E. Rowland....Holden, W.Va.
Eng Const—C. W. Snyder, " "
MM—R. H. Dice, " "
EE—Jas. Mainland, " " "
SCO—Island Creek Stores Co.
Buyer, W. J. Crutcher, " " "
Sales agent, R. S. McVeigh, Union Central Bldg., Cincinnati Ohio. and L. A. Hickey Land Title Bldg., Philadelphia, Pa.

Nos. 1 and 2 Mines, Drifts, Island Creek Coal Seam, 6 to 7½ ft. thick.
PO—Holden, W. Va. SP—Same. CTY—Logan. RR—C. & O.
MS—J. W. Snyder, Holden, W. Va.
S of H—18 elec. loco. Track gauge 44½ in.
S of M—19 elec. machines.
PP—10 Water tube and 8 return tubular boilers, total 2,000 H. P. 4 Gen. units, 550 volts. D, C. 6 pumps.
EMP—433. Last fiscal year output 563,181 tons.

Nos. 3 and 4 Mines, Drifts, Island Creek Coal Seam, 6 to 7½ ft. thick.
PO—Whitman, W. Va.; SP—Holden, W. Va.; CTY—Logan, RR—C. & O.

MS—Major Curry.....Whitman, W. Va.
S of H—12 elec. loco. Track gauge 44½ in.
S of M—12 elec. machines.
PP—550 volts D. C. 2 pumps. Central station.
EMP—393. Last fiscal year output 501,486 tons.

Nos. 5 and 6 Mines, Drift, Island Creek Coal Seam, 6 to 7½ ft. thick.
PO—Holden, W. Va. SP—Same. CTY—Logan. RR—C. & O.
MF—H. T. Welker.....Holden. W. Va.
S of H—5 elec. loco. Track gauge 44½ in.
S of M—5 elec. machines.
PP—550 volts D. C. Central station. 1 pump.
EMP—137. Last fiscal year output 191,433 tons.

Nos. 7 and 8 Mines, Slope, Island Creek Coal Seam, 6 to 7½ ft. thick.
PO—Holden, W. Va. SP—Same. CTY—Logan. RR—C. & O.
MS—W. S. Parsons, Holden. W. Va.
S of H—12 elec. loco. Track gauge 44½ in.
S of M—10 elec machines.
PP—4 pumps. Central Station.
EMP—389. Last fiscal year output 619,862 tons.

Nos. 9 and 10 Mines, Drifts, Island Creek Coal Seam, 6 to 7½ ft. thick.
PO—Holden. W. Va. SP—Same. CTY—Logan. RR—C. & O.
MF—Geo. Thompson, Holden, W. Va.
S of H—4 elec. loco. Track gauge, 44½ in.
S of M—3 elec. machines.
PP—1 pump. Central Station.
EMP—84. Last fiscal year output 153,490 tons.

Mines Nos. 11 and 12; Slope; Island Creek Coal Seam; 72 to 90 in. thick.
PO—Monaville, W. Va.; SP—Same; CTY—Logan; RR—C. & O.
MS—W. P. Ferguson, Monaville, W. Va.
S of H—3 elec. loco. Track gauge 44½ in.
S of M—6 elec. mach.
PP—Power from Central Station. 250 volts D. C., 4 pumps.
EMP—136. Last fiscal year output 184,164 tons.

ISLAND CREEK COLLIERY CO.
Switzer Mine; Drift, No. 2 Gas Seam, 84 to 102 in. thick.
PO—Switzer, W. Va.; SP—Same; CTY—Logan; RR—L. & S.
PR—J. M. Vest........Switzer, W.Va.
GM—J. M. Vest, " "
GS—J. M. Vest, " "
PA—J. M. Vest, " "
MS—Henry Miller, " "
EE—Wm. Black, " "
SM—John Reese, " "
TR—Fred Prichard....Huntington, W.Va.
EM—W. G. Wilkins Co...Logan, W.Va.
S of H—1 Elec. loco. and mules; track gauge 48 in.
S of M—4 Elec. mach.
PP—2 Return tubular boilers, toal 300 H. P., 2 gen. units 300 volts D. C., 3 pumps.
EMP—200. Last fiscal year output 200,000 tons.

ISLAND CREEK SUPERIOR COAL CO.
General Office, Omar, W. Va.
Island Creek Superior Mine; Drift; Island Creek Seam; 84 to 96 in. thick.
PO—Omar, W. Va.; SP—Same; CTY—Logan; RR—C. & O., Logan & Southern Branch.
PR—H. C. Jones........Logan, W. Va.
TR—E. C. Bearss........Omar, W. Va.
GM—E. C. Bearss, " "
PA—E. C. Bearss, " "
EM—B. D. Williams, " "
S of H—2 elec. loco. Track gauge 48 in.
S of M—2 elec. mach.
PP—Power purchased.
EMP—75. Last fiscal year output 25,000 tons. 3 months operating.

IVY BRANCH COAL COMPANY
General Office, Charleston, W. Va.
Ivy Branch Mine; Drift No. 5 Block Seam 60 to 68 in. thick.
PO—Ivaton, W. Va.; SP—Ivy Branch Station; CTY—Lincoln; RR—C. & O., Coal River branch.
PR—John W. Moore, Charleston, W. Va.
TR—John W. Moore, " "
GM—John W. Moore, " "
GS—John W. Moore, " "
PA—John W. Moore, " "
MS—Robert Townsend...Ivaton, W. Va.
EM—Hugh Eaton...Charleston, W. Va.
SM—H. S. Moore.....Ivaton, W. Va.
SCO—Ivy Branch Coal Co. " "
S of H—Mules and 2 elec. loco. Track gauge 42 in.
S of M—3 elec. mach.
PP—2 Erie return tubular boilers, total 300 H. P., 1 gen. unit, 250 volts D. C.
EMP—75. Just developing mine.

IVY WHITE ASH COAL CO.
General Office, Lynchburg, Va.
Ivy White Ash Mine; Drift; No. 5 Block Seam; 56 to 60 in. thick.
PO—Ivaton, W. Va.; SP—Ivy Branch, W. Va.; CTY—Lincoln; RR—C. & O., Coal River Branch.
PR—H. P. Adams......Lynchburg, Va.
TR—Clinton DeWitt, Jr. " "
GS—H. O. Adams......Ivaton, W. Va.
PA—H. O. Adams, " "
MS—J. W. Cuthbertson, Sr., Ivaton, W. Va.
EM—Ewing & Nelson..Clothier, W. Va.
SM—Glen C. Price, " "
S of H—1 storage battery loco.
S of M—3 elec. mach.
PP—2 H. S. & G. return tubular boilers, total 300 H. P., 1—150 K. W., 250 volts D. C.
EMP—35. Output 5,554. Just developing mine.

JACKSON COAL & MINING CO., (THE)
Jackson Furnace, Drift, Pittsburgh No. 8 Seam, 4½ ft. to 5½ ft. thick.
PO—Hartford, W. Va., SP—Same, CTY—Mason. RR—B. & O.
PR—A. E. Smith....Hartford, W.Va.
TR—H. F. Smith, " "
GM—H. F. Smith, " "
GS—E. A. Smith, " "
PA—E. A. Smith, " "
MS—Earl Ewing, " "
EE—Earl Ewing, " "
EM—Ohio Eng. & Con. Co., Pomeroy, O.
SCO—Liverpool Salt & Coal Co.,
SM—H. F. Smith....Hartford, W.Va.
S of H—2 Elec. loco., track gauge 42 in.
S of M—3 Elec. machines.
PP—3 return tubular boilers, total 450 H. P., 2 gen. units, 250 volts D. C., 4 pumps.
EMP—110. Last fiscal year output 33,479 tons.

JAMISON COAL & COKE CO.
General Office, Greensburg, Pa.
3 Mines in W. Va., 5 Mines in Penna.
PR—John M. Jamison, Oliver Bldg., Pittsburgh, Pa.
TR—Donald Macleod, Oliver Bldg., Pittsburgh, Pa.
PA—M. W. Head, Oliver Bldg., Pittsburgh, Pa.
GM—R. H. Jamison....Greensburg, Pa.
CE—C. E. Cowan, " "
GS—For W. Va.—John M. Wolfe Fairmont, W. Va.
Asst. Chief Eng., S. M. Eccles, Fairmont, W.Va.
SCO—Uuderwood Supply Co. Buyer, F. Anthony, Greensburg, Pa.
Sales Agent, W. G. Ireland, Oliver Bldg., Pittsburgh, Pa.

Jamison No. 7 Mine; Shaft, Pgh. Seam, 108 in. thick.
PO—Barrackville, W. Va.; SP—Same; CTY—Marion RR—B. & O.
MS—E. B. Beerbower, Barrackville, W. Va.
S of H—4 elec. loco. and mules Track gauge 44 in.
S of M—8 elec., 9 comp. air mach. and hand.
PP—4 Erie, water tube boilers, total 2000 H. P., 1 compressor, 1 pump.
EMP—378. Last fiscal year output 590,942 tons.

Jamison No. 8 Mine; Shaft; Pgh. Seam, 102 in. thick.
PO—Farmington, W. Va.; SP—Underwood, W. Va.; CTY—Marion; RR—B. & O., Wheeling Div.
MS—E. T. Lloyd. .Farmington, W. Va.
S of H—4 Elec. loco.; track gauge 44 in.
S of M—6 elec., 10 comp. air mach.
PP—8 Water tube boilers, total 2400 H. P., 2 compressors, 1 pump.
EMP—445. Coke ovens 115 Bee Hive. Last fiscal year output 499,820 tons.

Jamison No. 9 Mine; Shaft, Pgh. Seam 102 in. thick.
PO—Farmington, W. Va., R. F. D. No. 2; SP—Underwood, W. Va.; CTY—Marion; RR—B. & O., Wheeling Div.
MS—P. D. Costello, Farmington, W.Va., R. F. D. No. 2.
S of H—3 elec. loco. Track gauge 44 in.
S of M—4 elec. and 12 comp. air mach.
PP—8 Water tube boilers, toal 1850 H. P., 2 compressors, 1 pump.
EMP—360. Last fiscal year output 397,925 tons.

JEFFERSON COAL COMPANY
CE—Lewis & Burrell...Grafton, W. Va.
Note—This company expects to start developments soon.

JENKINS, J. B., COAL & COKE CO. (THE)
General Office, Prudential Bldg., Buffalo, N. Y.
Ariana Mine; Drift, L. Kittanning Seam, 108 to 120 in. thick.
PO—Mabie, W. Va.; SP—Same; CTY—Randolph; RR—C. & C.
PR—F. P. Merrell......Hornell, N. Y.
TR—Paul B. Hanks....Wellsville, N. Y.
GM—Chas. A. Storck...Buffalo, N. Y.
PA—Chas. A. Storck, " "

Res Mgr——John T. Fallon, Mabie, W. Va.
MS—David Edwards, " "
EE—Wm. George, " "
S of H—1 Elec. loco. and mules; track gauge 42 in.
S of M—Hand.
PP—2 McEwen return tubular boilers, total 200 H. P., 1 gen. unit 250 volts D. C.
EMP—100. Last fiscal year output 40,730 tons.
Sales Agent, Chas. A. Storck, Buffalo, N. Y.

JEWETT, BIGELOW & BROOKS COAL CO.
General Office, 111 Devonshire St., Boston, Mass.
Mines Nos. 1, 2, 3, 4, 5 and 6; Drifts; Pocahontas Seam; 30 to 54 in. thick.
PO—Twin Branch, W. Va.; SP—Same; CTY—McDowell; RR—N. & W.

VP—R. Grant..........Boston, Mass.
TR—E. M. Richards, " "
CE—Timothy W. Sprague, " "
PA—H. A. McCoy..Twin Branch, W.Va.
EM—S. D. Olwin, " "
MM—F. B. Agers, " "
EE—J. H. Parks, " "
SM—D. W. Bartoo, " "
MS—C. C. Morfit, Twin Branch, W. Va.
GS—J. W. Devison, Grant Town, W. Va.
S of H—Mules and 7 Elec. loco. Track gauge 48 in.
S of M—Hand and 23 Elec. mach.
PP—6 Return tubular boilers, total 900 H. P., 2 gen. units, 550 volts D. C., 28 pumps.
EMP—500. Last fiscal year output 524,100 tons.
Sales Agencies, Jewett, Bigelow & Brooks, Detroit, Mich.; New England Coal & Coke Co., Boston, Mass.

JOHN'S BRANCH COAL CO.
John's Branch Mine; Drift; War Creek Seam.
PO—War, W. Va.; SP—Same; CTY—McDowell; RR—N. & W., Dry Fork branch.
GM—H. M. Meyers.....Yukon, W. Va.
GS—J. W. Stricker.......War, W. Va.
MS—J. W. Stricker, " "
SM—A. M. Harman, " "
SCO—War Creek Supply Co.
S of H—Mules.
S of M—Hand.
EMP—24. Last fiscal year output 5000 tons.

JOHNSON, W. R., COAL CO.
Oakland Nos. 1 anl 2, Drift, Nos. 1 and 2 Gas Seams.
PO—Smithers, W. Va. SP—Same. CTY—Fayette. RR—K. & M..
PR—W. R. Johnson, Jr., Smithers, W. Va.
TR—W. R. Johnson, Jr., " " "
GM—W. R. Johnson, Jr., " " "
PA—W. K. Bridges, " " "
EE—Joe Davenport, " " "
SM—H. P. Pribble, " " "
S of H—Mules and 4 elec. loco. Track gauge 40 and 42 inches.
S of M—Hand, and 3 elec. machines.
PP—Buy power.
EMP—150. Last fiscal year output 75,000 tons.

JOHNSON, E. R. COAL MINING CO.
Nos. 1 and 2 Mines; Drift; Kanawha Seams, 4 to 5 ft. thick.
PO—Hughey, W. Va. SP—Peach Creek, W. Va. CTY—Logan. RR—C. & O.
PR—Edw. L. Stone,.... Roanoke, Va.
TR—Al. A. Stone, " "
GM—L. E. Armentrout, Borderland, W. Va.
PA—J. P. Small,...... Hughey, W. Va.
MS—J. P. Small, " " "
EE—W. M. Salyers, " " "
CE—J. B. McCorkle, Logan, W. Va.
SM—E. C. Bartram......Hughey, W.Va.
S of H—3 Elec. loco. Track gauge 44 in.
S of M—14 elec. mach.
PP—1 return tubular boiler, 125 H. P., 250 volts D. C.
EMP—23. Last fiscal year output 25,000 tons.

JONES-PARSONS COAL COMPANY
General Office, Barnabus, W. Va.
Idamay Mine; Drift; Main Island Creek; Seam; 84 ins. to 96 ins. thick.
PO—Barnabus, W. Va., SP—Same; CTY—Logan; RR—C. & O., Guyan Valley Branch.
PR—Harry P. Jones ..Barnabus, W. Va.
TR—J. K. Parsons " "
GM—Harry P. Jones " "
GS—Harry P. Jones " "
PA—Harry P. Jones " "
EM—Harry P. Jones " "
SCO—J. K. Parsons.
S of H—Mules. Track gauge 44in.
S of M—1 elec .mach.
PP—Purchase power.
EMP—115. Last fiscal year output, 120,000 tons. Sales Agency, Jones-Parsons Coal Co., Barnabus, W. Va.

KANAWHA RAIL & RIVER COAL CO.
Diamond, Edgewater, Mecca Gas and Mecca Splint Mines; Drifts; No. 2 Gas Eagle & Splint Seams; 58 to 96 in. thick.
PO—Eagle, W. Va.; SP—Montgomery, W. Va.; CTY—Fayette; RR—C. & O., Main line.
PR—J. N. Gellatly.....Eagle, W. Va.
GM—J. N. Gellatly, " "
TR—L. A. Donelon, " "
GS—J. A. Straughan, " "
MS—J. A. Straughan, " "
CE—H. E. Judd, " "
EM—H. E. Judd, " "
SCO—Kanawha Rail & River Co.'s Store. Buyer, W. H. Carver, Eagle, W. Va.
S of H—Mules, 7 elec. locos., 1 steam loco.
S of M—9 elec. machs.
PP—Generating units, 275 volts D. C. Purchase power.
EMP—300.
Note—Successors to the Mecca Colliery Co.

KANAWHA RIVER COAL CO.
Montgomery No. 2 Mine; Drift, No. 2 Gas Seam; 67 to 80 in. thick.
PO—Montgomery, W. Va.; SP—Same; CTY—Kanawha; RR—C. & O., Main Line.
PR—A. B. Thompson Montgomery, W.Va.
GM—A. B. Thompson, " "
MS—A. B. Thompson, " "
TR—S. H. Montgomery, " "
PA—F. A. Taylor, " "
EM—J. H. Jackson, " "
SCO—Montgomery Coal Co, " "
S of H—Mules.
S of M—3 elec. mach. and hand.
PP—Power purchased.
EMP—20. Output 3,222 tons from Jan. 4 to July 1st, 1915
Sales Agent, F. A. Taylor, Montgomery, W. Va.

KATHERINE COAL CO.
Now Quaker Splint Coal Co.

KEENEY'S CREEK COLLIERY CO.
General Office,...... Winona, W. Va
PR—W. S. Wood, Charleston, " "
TR—W. S. Wood, " " "
GM—J. Wade Bell Winona, " "
GS—J. Wade Bell, " " "
PA—J. Wade Bell, " " "
CE—Philip Konrad, Kanawha Falls, W. Va.
EM—Philip Konrad, " " " "
MM—T. H. Seacrist, Winona, " "
EE—Oscar Blozer, " " "
SM—W. F. Hall, " " "
Sales Agency, New River Coal Co., Charleston, W. Va.

Smokeless Mine, Drift, Sewell Seam, 3½ to 4 ft. thick.
PO—Winona, W. Va. SP—Masters, W. Va. CTY—Fayette. RR—C. & O. Keeney's Creek Branch.
S of H—Mules and 3 elec. loco. Track gauge 42 inches.
S of M—Hand and 4 elec. machines.
PP—2 Westinghouse M. G. sets, 100 K. W., 250 volts D. C., 3 pumps.
EMP—150. Last fiscal year output 81,000 tons.

Boone Mine, Drift, Sewell Seam, 3½ to 4 ft. thick.
PO—Boone, W. Va., SP—Same, CTY—Fayette. RR—C. & O., Keeney's Creek Branch.
S of H—Mules and 1 elec. and 1 steam loco., track gauge 44 inches.
S of M—Hand and 3 elec. machines.
PP—2 Water tube boilers, total 300 H. .. 1 gen. unit 250 volts D.C.
EMP—125. Last fiscal year output 68,000 tons.

KELLY'S CREEK COLLIERY CO.
PR—F. M. Staunton, Charleston, W.Va.
TR—Lester Ridenour.....Ward, W.Va.
GM—J. W. Dawson, " "
GS—Chas. C. Gressang, " "
PA—Chas. C. Gressang, " "
EM—G. H. P. Spruce, " "
MM—C. E. Hedrick, " "
EE—C. E. Hedrick, " "
SM—W. S. Brown, " "
SCO—Address the Company. Buyer, T. O. Parker, Ward, W. Va.
Sales Agent, J. W. Dawson, Ward, W.Va.

Mines Nos. 1 and 2; Drift; Coalburg Seam, 60 to 66 in. thick.
PO—Ward, W. Va., SP—Cedar Grove, W. Va.. CTY—Kanawha. RR—K. & M., K. C. & N. W. Rly.
MS—J. D. Jones........Ward, W. Va.
S of H—4 elec loco. Track gauge 42 in.
S of M—7 elec. mach.
PP—1 50_K.W. motor gen. units, 250 volts D. C. Buy power.
EMP—150. Last fiscal year output 100,000 tons.

Mines Nos. 3, Coalburg Seam, 66 to 72 in. thick.
PO—Ward, W. Va., SP—Cedar Grove, W. Va., CTY—Kanawha. RR—K. & M., K. C. & N. W. Rly.
MS—J. D. Jones........Ward, W. Va.
S of H—5 elec loco. Track gauge 42 in.
S of M—8 elec. mach.
PP—3 Return tubular boilers, total 300 H. P., 2 gen. units 250 volts D. C., 2 pumps.
EMP—210. Last fiscal year output 210,000 tons.

KENOVA COAL MINING CO.
Kenova Mine, Drift.
PO—Branchland, W. Va.; SP—Same: CTY—Wayne; RR—C. & O,. G. V. Div.
PR—Henry Holonscheid....Chicago, Ill.
GS—D. K. Geiger..Branchland, W. Va.
PA—D. K. Geiger, " "
Idle since January, 1911.

KEYSTONE COAL & COKE CO.
Keystone Mine; Drift; Pocahontas No. 3 Seam; 84 to 96 in. thick.
PO—Keystone, W. Va.; SP—Same; CTY—McDowell; RR—N. & W.
PR—T. E. Houston.....Cincinnati, O.
GM—T. E. Houston, " "
TR—N. H. Franklin, " "
GS—Benjamin Lewis...Elkhorn, W. Va.
MS—A. J. Stuart....Keystone, W. Va.
SM—L. M. Rish, " "
EM—R. W. Austin.....Elkhorn, W. Va.
S of H—Mules and 3 elec. loco. Track gauge 44 in.
S of M—Hand and 1 elec. mach.
PP—6 return tubular boilers, total 900 H. P., 2 gen. units, 500 volts D. C.
EMP—400. Last fiscal year output 500,000 tons.

KESSLER, D. P .COAL CO.
Arcola Mine, Drift, L. Kittanning Seam, 28 to 36 in. thick.
PO—Cowen, W. Va.; SP—Arcola, W. Va.; CTY— Webster; RR— B. & O.
PR—Dr. D. P. Kessler....Cowen, W.Va.
MS—S. L. Westfall, " "
EM—J. E. Anderson, " "
S of H—Mules.
S of M—Hand.
Last fiscal year output 15,000 tons.

KIMBALL POCAHONTAS COAL CO.
Virginia Mine, Slope, Pocahontas No. 3 Seam, 5½ ft. thick.
PO—Big Four, W. Va., SP—Same, (prepay) CTY—McDowell. RR—N. & W. (Main line)
PR—Chas. W. Freeman, Bramwell, W.Va
TR—Jairus Collins, " "
PA—Jairus Collins, " "
GS—P. Brady.......Bluefield, W. Va.
EE—J. C. Layman....Goodwill, W. Va.
CE—R. J. Gould....Bramwell, W. Va.
MS—Mike Barron....Big Four, W. Va.
S of H—1 elec. loco. Track gauge 44 in.
S of M—Hand and 1 elec. mach.
PP—2 water tube boilers, 3 pumps. Buy power.
EMP—65. Last fiscal year output 80,000 tons.
Sales agency, Smokeless Fuel Co., Cincinnati, O.

KING COAL CO.
King Mine, Slope, Pocahontas No. 3 Seam, 5 to 6½ ft. thick.
PO—Vivian, W. Va., SP—West Vivian, W. Va., CTY—McDowell. RR—Norfolk & Western.
PR—T. King..........Boston, Mass.
TR—T. King, " "
GM—C. H. Boardman..Vivian, W.Va.
GS—Bert C. Hylton, " "
PA—C. H. Boardman, Jr. " "
EM—Bert C. Hylton, " "
MS—S. B. Campbell.
SCO—King Coal Co., " "
Buyer, R. Terry Early, " "
MM—W. F. Harris....Kimball, W.Va.
EE—W. F. Harris, " "
S of H—Mules and 3 Elec. and 1 Storage battery loco.; track gauge 44 in.
S of M—Hand and 5 elec. machines.
PP—6 Return tubular boilers, total 750 H. P., gen. units 250 volts D. C. 2 pumps.
EMP—410. Last fiscal year output 287,121 tons.

KINGS CREEK COAL CO.
New Cumberland, W. Va. No report.

KINGWOOD COAL CO.
General Office, North American Bldg., Phila.
Howesville Mine, Drift; Lower Freeport Seam; 4 to 5½ ft. thick.
PO—Howesville, W. Va.; SP—Same; CTY—Preston. RR—W. Va., Northern.
PR—Wm. Atkins..........Phila., Pa.
TR—Wm. Atkins, " "
MS—Isaac Conn....Howesville W. Va.
SCO—Coffman & Fisher Co. " "
S of H—Rope and mules, track gauge 4½ ft.
S of M—6 Comp. air mach.
PP—2 Return tubular boilers total 250 H. P., 2 comp., 3 pumps.
EMP—70. Last fiscal year output 62,000 tons.

KLINEFELTER, J. S. & CO.
See Hygrade Coal Co.

KUNTZ BROS. & MILLER.
Boggs Run Mine.
PO—Wheeling, W. Va.; CTY—Marshall.
Note—Mine worked out.

LA BELLE IRON WORKS.
General Office, Steubenville, O.
One mine in Penna, 1 in West Virginia, 1 in Ohio.
La Belle Mine, Drift, Pgh. Seam.
PO—Wheeling, W. Va. SP—Same. CTY—Ohio. RR—B. & O., P. R. R., W. & L. E.
GM—G. B. Le Van....Steubenville, O.
PA—R. M. Rice, " "
EM—J. C. Gibson, " "
MS—R. W. McCasland, " "
S of H—Mules.
S of M—Hand,
PP—Power supplied by the mills.
EMP—26.

LAKE SUPERIOR COAL CO.
General Office, Cannelton, W. Va.
PR—W. C. Franz, Saunt Ste. Marie, Ont.
TR—A. A. Chitty, " " "
GM—W. C. Franz, " " "
GS—F. O. Harris .. Cannelton, W. Va.
PA—F. O.Harris, " "
EM—H. C. Sale......Superior, W.Va.
MS—J. A. Straughan, " "
SM—Fred Morgan, " "
Sales agents, W. C. Atwater & Co., New York City, N. Y.

Lake Superior No. 1 Mine, Shaft, No. 3, Pocahontas Seam, 3½ to 6 ft.
PO—Superior, W. Va., SP—Same, CTY McDowell; RR—N. & W.
S of H—7 Elec. loco., track gauge 48 in.
S of M—Pick and 4 elec. mach.
PP— 4 Return tubular boilers, total 600 H. P., 2 gen. units 250 volts D. C., 1 air comp. and 3 pumps.
EMP—100. Last fiscal year output 88,234 tons.

Lake Superior No. 2 Mine, Shaft, No. 4 Pocahontas Seam, 3½ to 6 ft. thick.
PO—Superior, W. Va., SP—Same, CTY —McDowell. RR—N. & W.
S of H—5 Elec. loco., track gauge 48 in.
S of M—Pick and 3 elec. mach.
PP—2 Return tubular boilers, total 300 H. P., 1 air comp. and 2 pumps. Power furnished from No. 1 Mine.
EMP—85. Last fiscal year output 52,192 tons.

LAMBERT RUN COAL CO.
General Office, Fairmont, W. Va.
Clanson Mine; Slope; Pgh. Seam, 84 to 96 in. thick.
PO—Meadowbrook, W. Va.; SP—Same, CTY—Harrison; RR—B. & O., Short Line.
PR—C. O. Henry....Fairmont, W.Va.
TR—C. D. Robinson, " "
GM—C. D. Robinson, " "
PA—C. D. Robinson, " "
MS—Dorsey Pope, " "
S of H—2 elec. loco. Track gauge 36 in.
S of M—5 elec. mach. and hand.
PP—Power purchased, 4 pumps.
EMP—80. Last fiscal year output 17,521 tons.

LANARK COAL CO.
Lanark No. 4 Mine; Drift, Sewell Seam, 54 in. thick.
PO—Lanark, W. Va.; SP—Same (prepay); CTY—Raleigh; RR—C. & O.
PR—John B. Laing...Lewisburg, W. Va.
GM—John B. Laing, " "
MS—H. S. Nelson.....Lanark, W. Va.
EM—Hal M. Scott, " "
SCO—Lanark Store. Buyer, M. K. Hoke, Lanark, W. Va.
S of H—2 Elec. loco.; track gauge 42 in.
S of M—Hand.
PP—2 Return tubular boilers, gen. units 500 volts D. C., 2 pumps.
EMP—80. Last fiscal year output 45,000 tons.

LATE, GORDON B., COAL CO.
See Independence Coal Co.

LATHROP COAL CO.
General Office, Welch, W. Va.
Lathrop Mine, Drift, Bastard, Pocahontas and Splint Seam, 5 ft. 10 in. thick. Operate washery.
PO—Panther, W. Va., SP—Same, CTY—McDowell; RR—N. & W.
PR—William Leckie....Welch, W.Va.
TR—A. E. Jennings, " "
GM—William Leckie, " "
CE—J. Harvey Williams, " "
EM—J. Harvey Williams, " "
GS—W. S. Leckie.....Panther, W. Va.
PA—W. S. Leckie, " "
MM—W. R. Talbot, " "
MS—W. S. Leckie, " "
EE—H. D. Scott, " "
SCO—Lathrop Supply Co., " "
Buyer, J. H. Pillis, Panther, W. Va.
S of H—7 elec. loco. Track gauge 36 in.
S of M—4 elec. mach.
PP—1 Wicks water tube boiler, 150 H. P. 1 150 K. W. gen. unit, 250 volts D. C., 2 pumps.
EMP—150. Last fiscal year output 203,895 tons.
Sales agency, West Virginia Pocahontas Coal Co.

LAUREL CREEK COAL CO.
Laurel Mine, Drift, Fire Creek Seam, 3½ to 4½ ft. thick.
PO—Laurel Creek, W. Va., SP—Express and prepay freight, Laurel, W. Va., CTY—Fayette. RR—Ches. & Ohio. Laurel Creek Br.
PR—C. C. Beury....Claremont, W. Va.
TR—George Lawton, " "
GM—George Lawton, " "
GS—W. E. Lawton, Laurel Creek, W.Va.
PA—W. E. Lawton, " "
EM—S. H. Bridge.

Laurel Creek Coal Co.—Cont.
SCO—Laurel Creek Coal Co. Store, Buyer, John F. Biggers, Laurel Creek, W. Va.
S of H—4 Elec. loco., track gauge 44 in.
S of M—Hand and 1 elec. mach.
PP—5 pumps. Power purchased.
EMP—80. Last fiscal year output 58,000 tons.
Sales Agents, New River Coal Co., Charleston, W. Va.

LECKIE COLLERIES CO.
Nos. 1, 2, 3, 4 and 5 Mines; Drift, Coalburg, Alma, Winifrede, Thacker and Freeburn Seams, 42 to 84 in. thick.
PO—Aflex, Ky.; SP—Same; CTY—Pike;
PR—Wm. Leckie........Welch, W.Va.
GM—Wm. Leckie, " "
PA—Wm. Leckie, " "
TR—A. E. Jennings, " "
EM—J. H. Williams, " "
MS—W. B. Beale..........Aflex, Ky.
S of H—4 elec. loco.
S of M—2 elec. mach.
PP—Purchase power.
EMP—50.
Sales Agency, West Virginia Pocahontas Coal Sales Corp.
Note—New operation.

LECKIE FIRE CREEK COAL COMPANY
General Office, Welch, W. Va.
Drift Mine; Fire Creek Seam; 45 to 68 in. thick.
PO—Not yet named; SP—Pemberton, W. Va.; CTY—Raleigh, RR—Virginian.
PR—Wm. Leckie........Welch, W. Va.
GM—Wm. Leckie, " "
PA—Wm. Leckie, " "
TR—A. E. Jennings, " "
CE—J. H. Williams " "
GS—A. F. Leckie,
R. F. D., Pemberton, W. Va.
MS—A. F. Leckie,
R. F. D., Pemberton, W. Va.
EM—M. H. Hall,
R. F. D., Pemberton, W. Va.
S of H—Elec. locos.
S of M—Machines.
PP—Purchase power.

LEHIGH COAL COMPANY
General Office Morgantown, W. Va.
Lehigh No. 1 Mine; Drift; Pittsburgh Seam; 102 to 126 in. thick.
PO—Lowesville, W. Va.; SP—Monon; CTY—Monongalia; RR—B. & O., Monongalia branch.
Receivers—G. B. Hartley, and W. E. Glasscock, Morgantown, W. Va.
GM—G. B. Hartley, Morgantown, W.Va.
GS—G. B. Hartley, " "
CE—G. B. Hartley, " "
PA—G. B. Hartley, " "
MS—L. S. Stierm...Lowesville, W.Va.
EM—Monongalia Valley Eng. Co.
S of H—1 elec. loco. Track gauge 42 in.
S of M—2 elec. mach.
PP—1 Erie Return tubular boiler, total 150 H. P., 1 gen. unit, 250 volts D. C.
EMP—30. Last fiscal year output 40,000 tons.

LEWIS COAL & COKE CO.
Lewis Mine, Drift and Slope, Lewiston and Peerless Seams, 4½ ft. thick.
PO—Chelyan, W. Va., SP—Calvin Creek Jct., W. Va., CTY—Kanawha. RR—C. & O.
PR—S. A. Lewis....Chelyan, W. Va.
TR—Dr. L. Prichard Charleston, W.Va.
GM—S. A. Lewis......Chelyan, W.Va.
CS—W. M. Rollins, " "
PA—W. M. Rollins, " "
SM—W. M. Rollins, " "
CE—Ronnie & Snider, Charleston, W.Va.
EM—Ronnie & Snider, " "
MM—E. L. Shain....Chelyan, W. Va.
EE—D. W. Cadd, " "
S of H—Mules and 1 elec. loco., track gauge 42 in.
S of M—4 Elec. machines.
PP—1 Pump.
(Old information.)

LEWISTON BLOCK COAL COMPANY
Lewiston Mine; Drift; Lewiston-Belmont Seam; 42 to 72 in. thick.
PO—Lewiston, W. Va.; SP—Winifred Junct.; CTY—Kanawha; RR—C. & O.
PR—T. H. Johnson......Bridgeport, O.
TR—C. H. Eberts....Warwood, W. Va.
GM—H. H. Weiske...Lewiston, W. Va.
GS—H. H. Weiske, " "
PA—H. H. Weiske, " "
EM—H. H. Weiske, " "
SM—C. A. Springston, " "
S of H—Mules. Track gauge 40 in.
S of M—Hand and 3 elec. mach.
PP—Power purchased. 250 volts D. C.
EMP—50.

LILLY MINING CO.
General Office, Glen Morgan, W. Va.
Whorley Nos. 1 and 2 Mines; Drift; Beckley Seam; 48 to 84 in. thick.
PO—Glen Morgan, W. Va.; SP—Raleigh, W. Va.; CTY—Raleigh; RR—C. & O., Piney br.
PR—L. C. Lilly, Glen Morgan, W. Va.
TR—L. C. Lilly, " "
GM—Wm. Hackworth, " "
GS—Wm. Hackworth, " "
MS—Wm. Hackworth, " "
EM—Hunter Smith....Raleigh, W. Va.
S of H—Mules. Track gauge 44 in.
S of M—Hand.
EMP—43. Last fiscal year output 34,000 tons.

LILLYBROOK COAL CO., INC.
General Office, Pemberton, W. Va.
Drift Mine; Beckley & Pocahontas Seams; RR—Virginian; C. & O.
PR—Prince E. Lilly, Pemberton, W. Va.
GM—John R. Harnbrook " "
TR—T. H. Wickam ... Beckley, W. Va.
Sec—R. C. Harnbrook, Pemberton, W. Va.
S of H—Will be electric.
Note—Have just begun development. Will be ready to ship coal Aug. 1st, 1916.

LINCOLN COAL MINING CORP
Receiver, E. F. Hartley, Fairmont, W. Va.
General Office, Fairmont, W.Va.
Lincoln Mine; Slope; Alma Seam, 42 to 60 ins. thick.
PO—Big Creek, W.Va.; SP—Same; CTY—Logan; RR—C. & O.; Guyan Valley Branch.
PR—H. J. Hartley, Fairmont, W.Va.
TR—F. B. Pryor, " "
PA—E. F. Hartley....Fairmont, W. Va.
MS—A. O. Scott ....Big Creek, W. Va.
SCO—Toney Bros., Big Creek, W. Va.
S of H—2 Elec. loco.; track gauge 44 in.
S of M—3 Elec. mach.
PP—Gas engines, 2 gen. units 250 volts D. C., 1 pump.
EMP—30.
Note—Idle at present.

LITZ-SMITH COAL CO.
Eagle Mine; Drift, Eagle Seam, 84 to 90 in. thick.
PO—Accoville, W. Va.; SP—Same, CTY—Logan; RR—C. & O.
PR—A. Z. Litz.........Tazewell, W.Va.
TR—R. R. Smith....Huntington, W.Va.
MS—F. E. Dulaney....Accoville, W.Va.
CE—W. C. McColl, " "
SM—W. E. Corn, " "
S of H—Mules.
S of M—Elec. mach.
PP—Power purchased, 1 pump.
EMP—25.
Sales Agency, Litz-Smith Fuel Co., Huntington, W. Va.
New operation.

LITZ-SMITH POCAHONTAS COAL CO.
General Office, Cucumber, W. Va.
Litz Mine; Drift; Pocahontas No. 3 Seam; 69 to 78 in. thick.
PO—Cucumber, W. Va.; SP—Newhall, W. Va.; (prepay); CTY—McDowell; RR—N. & W., Jacob's Fork branch.
PR—A. Z. Litz.........Tazewell, Va.
GM—A. Z. Litz, " "
GS—A. Z. Litz, " "
EM—J. P. Williams, " "
TR—J. F. Johnson......Welch, W. Va.
PA—G. A. Koger.....Cucumber, W. Va.
MS—G. A. Koger, " "
MM—W. C. Osborne, " "
EE—W. C. Osborne, " "
SCO—J. D. Brewster & Co., " "
S of H—Mules. Track gauge 44 in.
S of M—Hand.
PP—1 pump. Purchase power
EMP—20. Daily output, 2 carloads.

LOGAN COAL CO.
Logan Mine; Drift, Winifrede Seam, 54 to 60 in. thick.
PO—Ethel, W. Va.; SP—Same; CTY—Logan; RR—C. & O., Guyan Valley Br.
PR—Harry Bowen....Freeman, W. Va.
TR—J. C. Pack, " "
GM—L. Epperly..........Ethel, W.Va.
PA—J. C. Hindsley, " "
MS—J. C. Hindsley, " "
EM—J. D. Martin, " "
EE—Lou Davis, " "
SCO—Address the Company. Buyer, A. M. Hall, Ethel, W. Va.
S of H—3 elec. loco. Track gauge 44 in.
S of M—5 elec. mach.
PP—2 Return tubular boilers, total 300 H. P., gen. unit 250 volts D. C., 1 pump.
EMP—100. Lasct fiscal year output 117,784 tons.
Sales Agency, Smokeless Fuel Co.

LOGAN MINING CO.
PR—C.E.Hutchinson, Fairmont, W.Va.
TR—E. C. Curry..... Logan, W.Va.
GM—J. J. Ross, " "
PA—M. C. Lough....Fairmont, W.Va.
EM—B. L. Flynn,......Logan, W. Va.
Store Buyer, E. M. Jeffreys.
Sales Agents, Hutchinson Coal Co.

Earling Mine, Drift, No. 2 Gas Seam, 5 to 5½ ft. thick.
PO—Manbor, W. Va., SP—Earling, W. Va., CTY—Logan. RR—C. & O., Guyan Valley Br.
MS—Frank E. Hutchinson,
Manbor, W. Va.
S of H—Mules and 3 elec. loco.; track gauge 44 in.
S of M—5 Elec. mach.
PP—2 Return tubular boilers, total 270 H. P., 1 gen. unit 250 volts D. C., 1 pump.
EMP—108. 10 Bee Hive ovens.
Last fiscal year output 139,624 tons.

Manitoba Mine, Drift; Chilton Seam; 5 ft. 2 in. thick.
Po—Ethel, W. Va., SP—Same, **CTY**—Logan. RR—C. & O.
MS—C. H. Rhodes......Ethel, W. Va.
SM—W. A. Mick, " "
S of H—2 Elec. loco., track gauge 44 in.
S of M—4 Elec. machines.
PP—2 Return tubular boilers, total 300 H. P., 1 gen. unit, 250 volts D. C., 1 pump.
EMP—90. Last fiscal year output, 85,565 tons.

Wanda Mine, Drift; Clinon Seam, 4 ft. 6 in. to 5 ft. 4 in. thick.
PO—Ethel, W. Va.; SP—Wanda, W. Va.; CTY—Logan, RR—C. & O. Guyan River Div.
MS—C. D. Hylton......Ethel, W. Va.
S of H—Mules and 1 Elec. lovo.; track gauge 44 in.
S of M—5 E.cel mach.
PP—Power purchased.
EMP—95. Last fiscal year output, 88,074 tons.

Mona Mine; Slope, Cedar Grove Seam, 76 to 84 in. thick.
PO—Monaville, W. Va.; SP—Same; CTY—Logan; RR—C. & O., Main Island Creek Branch.
MS—W. G. Whitman, Monaville, W. Va.
S of H—2 Storage battery loco.; track guage 44 in.
S of M—2 Elec. mach.
PP—1 Return tubular boilers, 150 H. P., gen. units 250 bolts D. C., 3 pumps.
EMP—60. Last fiscal year output 98,439 tons.

Rossmore Mine; Slope, Cedar Grove Seam, 80 to 90 in. thick.
PO—Monaville, W. Va.; SP—Same, Rossmore Siding, W. Va.; CTY—Logan RR—C. & O., Main Island Creek Br.
MS—Fred Haislip....Rossmore, W. Va.
S of H—Rope; track gauge 44 in.
S of M—1 Elec. mach.
PP—1 Water tube boilers, 60 H. P., 1 pump.
EMP—25. Last fiscal year output 17,983 tons.

LONE JACK MINING CO.
Red Ash Mine; Drift, Douglas or Red Ash Seam, 30 in. thick.
PO—Iaeger, W. Va.; SP—Same; CTY—McDowell; RR—N. & W., Dry Fork Br.
PR—V. T. Strickler......Iaeger, W.Va.
GM—V. T. Strickler, " "
MS—V. T. Strickler, " "
SM—V. T. Strickler, " "
TR—J. W. Strickler, ...War, W. Va.
EM—G. J. Cooper,.....Welch, W. Va.
S of H—Mules.
S of M—Hand.
EMP—20. Last fiscal year otuput 17,000 tons.

LONG BRANCH COAL CO.
No. 2 Mine; Drift, Seam 72 in. thick.
PO—Long Branch, W. Va.; SP—Same; CTY—Fayette;; RR—Virginian, Mam Line.
PR—P. M. Snyder....Mt. Hope, W.Va.
TR—L. Graney....Long Branch, W.Va.
GM—L. Graney, " "
SM—W. P. Myers, " "
S of H—2 gasoline, 2 steam loco. and 1 elec. loco. Track gauge 42 in.
S of M—Hand.
Last fiscal year output 100,953 tons.
Sales Agency, Spring Coal Co., Boston, Mass.

LONG FLAME COAL CO.
General Office, Stone, W. Va.
Long Flame Mine, Drift; Eagle or No. 2 Gas Seam; 78 to 102 in. thick.
PO—Stow, W. Va.; SP—Craneco, W. Va.; CTY—Logan. RR—C. & O., Guyan Valley Branch.
PR—W. J. Pritchard, Bramwell, W.Va.
GM—W. J. Pritchard, " "
TR—E. S. Baker, " "
PA—W. E. Pritchard.....Stow, W.Va.
MS—W. E. Pritchard, " "
CE—A. H. Stowe.....Pocahontas, Va.
EM—A. C. Dawson...Accoville, W.Va.
SCO—Address the Company. Buyer, Wm. Davis, Stow, W. Va.
S of H—Mules, 1 storage battery and 2 elec. loco. Track gauge 44 in.
S of M—2 Elec. machines.
PP—1 B. & W. water tube boiler total 250 H. P., 1 rotary converter, 250 volts D. C.
EMP—100. Last fiscal year output, 82,204 tons.
Sales Agency, Virginia Coal Co.

LONG, J. E., COAL CO. (THE)
Burke Mine; Drift, Pgh. Seam, 84 to 96 in. thick.
PO—Clarksburg, W. Va.; SP—Same; CTY Harrison; RR—B. & O.
PR—J. Edgar Long....Clarksburg, W.Va.
TR—J. Edgar Long, " "
PA—J. Edgar Long, " "
MS—B. H. Monroe, " "
S of H—Mules.
S of M—Hand.
EMP—30.
Sales Agent, J. Edgar Long, Clarksburg, W. Va.

LOOKOUT COAL & COKE CO.
Lookout Mine; Slope; Sewell Seam, 48 in. thick.
PO—Lookout, W. Va., SP—Same, CTY—Fayette RR—C. & O., Keeney's Creek Branch.
TR—D. W. Boone.....Lookout, W.Va.
GM—D. W. Boone, " "
PA—J. H. Walker, " "
MS S. J. Bays " "
EE—S. J. Bays, " "
EM—Clark & Krebs, Charleston, W.Va.
SCO—Lookout Coal & Coke Co., Buyer, J. H. Walker, Lookout, W.Va.
S of H—Mules and 8 elec. loco., track gauge 42 in.
S of M—Hand and 4 elec. mach.
PP—Power purchased.
EMP—63.
Sales Agents, C. & O. Coal Agency Co., Boston, Mass.

LORAIN COAL & DOCK COMPANY
General Office, Columbus, O.
Lorado Mine; Drift; Island Creek Seam; 72 to 84 in. thick.
PO—Craneco, W. Va.; SP—Same; CTY—Logan; RR—C. & O., Buffalo Creek branch.
PR—F. W. Braggins......Columbus, O.
TR—Ray L. Phelpps, " "
1st VP—R. L. Wildermuth, " "
2nd VP—A. C. Ingersoll, " "
PA—O. D. Waters.......Bridgeport, O.
Chairman, B. of D.—Edward Johnson,
Columbus, O.
EM—Geo. W. Wyss.......Bridgeport, O.
S of H—Elec. locos.
S of M—Elec. mach.

LOUISVILLE COAL & COKE CO.
Louisville and Goodwill Mines, Drifts Pocahontas No. 3 Seam, 4½ to 5½ ft. thick. Operate washery.
PO—Goodwill, W. Va., SP—Same (prepay), CTY—Mercer. RR—N.&W. Bluestone Branch.
PR—Isaac T. Mann..Bramwell, W.Va.
TR—Jairus Collins...Goodwill, W. Va.
GM—Jairus Collins, " "
PA—Jairus Collins, " "
MS—W. R. Dudley, " "
EM—R. J. Gould, " "
SM—B. G. Scott, " "
S of H—Mules and 4 elec. loco., track gauge 44 in.
S of M—Hand and 3 elec. mach.
PP—6 Erie return tubular boilers, total 850 H. P., 2 gen. units 250 volts D. C., 1 Compressor and 2 pumps. Also buy power
EMP—250. Coke ovens. 235 Bee Hive Last fiscal year output 157,900 tons.
Sales Agency, Smokeless Fuel Co., Cincinnati, Ohio.

LOUP CREEK COLLIERY CO.
Loup Creek No. 2 Mine; Drift, No. 2 Gas Seam, 54 to 108 in. thick.
PO—Page, W. Va.; SP—Same; CTY—Fayette; RR—Virginian.
GM—J. C. R. Taylor......Page, W.Va.
PA—J. C. R. Taylor, " "
EM—J. C. Mabe, " "
MM—Mason Smith, " "
MS—D. S. Dooley, " "
SM—J. P. Twohig, " "
S of H—11 elec., 3 steam loco and mules; track guage 44 in.
S of M—11 Elec. mach. and hand.
PP—2-200 K. W. 500 volts D. C., gen. driven by 2-2200 volts A. C., 3 phase. Power purchased.
EMP—375; Coke ovens 505 Bee Hive, not in operation.
Last fiscal year output 266,000 tons.
Sales Agency, Eastern Coal & Export Corp., Richmond, Va.
Note—Are developing new mine, Eagle No. 1 Seam.

LOW MOOR IRON CO. OF VA.
PR—Frank Lyman,
14 Wall St., New York, N. Y.
TR—H. A. Dalton, " "
GM—Frank N. Humbert..Low Moor, Va.
PA—W. N. Croxton, " "
EM—Mr. Rothrock...Kay Moor, W. Va.
GS—J. W. Montieth..Low Moor, W. Va.
MS—C. C. Cooke....Kay Moor, W. Va.
SM—H. N. Sanford....Low Moor, Va.
Sales Agent, John B. Guernsey, Low Moor, Va.

Kay Moor No. 1 Mine; Drift, Sewell Seam, 33 to 48 in. thick.
PO—Kay Moor, W. Va.; SP—Same; CTY—Fayette; RR—C. & O., Main Line.

(Continued on Next Page.)

Low Moor Iron Co. of Va.—Cont.
S of H—5 elec. loco. and mules. Track gauge 44 in.
S of M—7 elec. mach. and hand.
PP—1 Atlas, water tube, 4 Erie City, return tubular boilers, total 775 H. P., 2 gen. units, 1-150 K. W., 250 volts D. C., 1-3450 volts A. C., 3 phase, 25 cycles, 8 pumps.
EMP—300. Coke ovens, 126 Bee Hive.
Last fiscal year output 79,128 tons.
Note—Idle past four months.

Kay Moor No. 2 Mine; Drift, Sewell Seam, 33 to 44 in. thick.
PO—Fayette, W.Va.; SP—South Fayette, W.Va.; CTY—Fayette; RR—C. & O., Main Line.
S of H—Mules. Track gauge 44 in.
S of M—3 Elec. mach.
PP—1 Return tubular boiler 100 H. P. 1 pump. Power from No. 1 Mine.
Note—Idle during past year.

LOW ASH COAL COMPANY, INC.

General Office Crown, W. Va.
Low Ash Mine; Drift; Big Eagle Seam; 84 in. thick.
PO—Crown, W. Va.; SP—Accoville, W. Va.; CTY—Logan; RR—C. & O., Guyan Valley branch.
PR—W. J. Heatherman....Wilder, Va.
TR—James Heatherman..Crown, W. Va.
GM—James Heatherman, " "
GS—James Heatherman, " "
EM—E. Dawson.....Accoville, W. Va.
S of H—Mules.
S of M—1 elec. mach.
PP—220 volts A. C., 3 phase, 60 cycles. Purchase power.

LUELLA COAL & COKE CO.

Luella Mine; Drift; Kittanning Seam; 60 to 72 in. thick.
PO—Arden, W. Va., SP—Same, CTY—Barbour. RR—B. & O., Belington Branch.
PR—John T. Robinson, Uniontown, Pa.
TR—Wiley L. Byers, " "
GM—Herbert M.Crawford, Phillippi,W.Va
GS—Herbert M. Crawford, " "
PA—Herbert M. Crawford, " "
MS—Jas. H. Robinson .. Arden, W.Va.
SCO—Luella Supply Co., Buyer, L. O. Smith, Arden, W.Va.
S of H—Mules, track guage 42 in.
S of M—Hand.
EMP—50. Last fiscal year output 45,000 tons.

LUNDALE COAL COMPANY

General Office, Huntington, W. Va.
Lundale Mine; Drift; Island Creek Seam; 78 to 90 in. thick.
PO—Craneco, W. Va.; SP—Big Vein; CTY—Logan; RR—G. V., Branch C. & O.
PR—Geo. W. Jones....Redstar, W. Va.
TR—T. H. Hooper, Huntington, W. Va.
GM—J. N. Schweitzer, Amherstdale, W. Va.
PA—J. N. Schweitzer, Amherstdale, W. Va.
GS—J. N. Schweitzer, Amherstdale, W. Va.
MS—W. W. Beddow, Craneco, W. Va.
CE—Beddow, McCorkle & Wilson Logan, W. Va.
EM—Beddow, McCorkle & Wilson Logan, W. Va.
SCO—Lundale Coal Co. Store, Buyer, C. W. Hardy, Amherstdale, W. Va.
S of H—4 elec. locos. Track gauge 44 in.
S of M—4 elec. mach.
EMP—150. Sales Mgr., E. J. Payne, Secy., Huntington, W. Va.
Note—Successors to Kohnor Coal & Coke Co.

LYNCHBURG COAL & COKE CO.

Lynchburg Mine; Drift, Poca. No. 3 Seam, 84 to 108 in. thick.
PO—Kyle, W. Va.; SP—Northfork, W. Va.; CTY— McDowell; RR—N. & W.
PR—L. E. Tierney...Powhattan, W. Va.
GM—L. E. Tierney, " "
EM—G. H. Wilcox......Kyle, W. Va.
MS—L. J. South, " "
SM—F. M. Junkin, " "
TR—R. H. T. Adams, Jr., Lynchburg, Va.
PA—T. W. Chambers..Eckman, W. Va.
MM—E. B. Stone.....Powhatan, W.Va.
EE—E. B. Stone, " "
S of H—2 elec. loco. Track gauge 43½ in.
S of M—Hand.
PP—5 Return tubular boilers, total 575 H. P., 1 compressor, 3 pumps.
EMP—260. Coke ovens, 214 Bee Hive Last fiscal year output 215,000 tons.
Sales Agency, Crozer, Pocahontas Co., Philadelphia, Pa.

LYNCHBURG COLLIERY CO.

Lynchburg Mine, Drift, No. 2 Gas Seam, 4 ft. thick, and No. 5 Splint Seam, 6 ft. thick.
PO—Vanetta, W. Va., SP—Same, CTY—Fayette. RR—C. & O.
PR—F. P. Christian, Lynchburg, W.Va.
TR—T. A. Deitz......Vanetta, W.Va.
GM—T. A. Deitz, " "
GS—T A. Deitz, " "
PA—T. A. Deitz, " "
MS—J. C. Grisinger, " "
SM—C. R. Wilson. " "
EM—Philip Konrad, Kanawha Falls, W.Va.
S of H—Mules, 2 steam and 1 gasoline loco. Track gauge 40 in.
S of M—Elec. mach.
PP—Power purchased.
EMP—150. Last fiscal year output 31,319 tons.

LYNWIN COAL CO.

Lynwin Mine; Drift; Beckley Seam, 60 in. thick.
PO—Winding Gulf; SP—Mistletoe; CTY—Raleigh; RR—V. G. N.
PR—C. L. Goodwin....Greensburg, Pa.
TR—P. C. Lynch......Blue Jay, W.Va.
GM—P. C. Lynch, " "
GS—E. J. Flanagan, Winding Gulf, W.Va.
PA—E. J. Flanigan, " "
EM—S. T. Farley, " "
MM—M. B. Flanagan, " "
MS—W. H. Sanford, " "
SM—W. A. Flanagan, " "
S of H—2 Elec., 1 gasoline loco.; track guage 42 in.
S of M—3 elec. mach.
PP—2 Return tubular boilers, total 225 H. P., gen. units 250 volts D. C.
EMP—110. Last fiscal year output 78,150 tons.
Sales Agency, West Virginia Coal Co., Richmond, Va.

MacALPIN COAL CO.

General Office, Charleston, W. Va.
MacAlpin Mine; Drift; Beckley Seam; 54 to 72 in. thick.
PO—MacAlpin, W. Va.; SP—Same; CTY—Raleigh; RR—C. & O. and Virginian, Winding Gulf Branch.
PR—John Laing....Charleston, W. Va.
TR—James Martin...Charleston, W. Va.
CE—F. C. Cornet, " "
GM—A. W. Laing....MacAlpin, W. Va.
GS—A. W. Laing, " "
PA—John Laing.....Charleston, W. Va.
PA—Lowry Lewis ....MacAlpin, W. Va.
SM—Lowry Lewis, " "
EE—R. A. Cunningham, " "
S of H—14 elec. loco. Track gauge 48 in.
S of M—12 elec. mach.
PP—4 Houston, Sanwood & Gamble water Tube boilers, total 1000 H. P., 2 gen. units, 250 volts D. C.
EMP—260.
Sales Agency, New River Coal Co., Richmond, Va.

McCAA COAL CO.

General Office, Charleston, W. Va.
McCaa Mine, Drift, Pgh. Seam, 60 to 96 in. thick.
PO—Gilmer, W. Va.; SP—Same; CTY—Gilmer; RR—C. & C.
PR—John Laing.....Charleston, W. Va.
GM—John Laing, " "
PA—John Laing, " "
TR—T. J. Robson, " "
GS—James Martin, " "
EM—R. M. Green, " "
MM—Geo. Ryan........Gilmer, W. Va.
MS—James Raisbeck, " "
SCO—McCaa Coal Co. Buyer, E. A. Jackson, Gilmer, W. Va.
S of H—2 elec. locos. Track gauge 44 in.
S of M—3 elec. mach.
PP—2 water tube boilers, total 600 H. P., 1 gen. unit, 250 volts D. C., 2 pumps.
EMP—41. Last fiscal year output 53,911 tons.

McCORMICK COAL COMPANY

General Office, McWhorter, W. Va.
McWhorter Mine; Drift; Red Stone and Pgh. Seam; 84 in. thick.
PO—McWhorter, W. Va.; SP—Same; CTY—Harrison; RR—B. & O.
PR—M. A. McCormick, McWhorter, W.Va.
TR—M. A. McCormick, " "
GM—J. L. Kaufman, " "
GS—J. L. Kaufman, " "
PA—J. L. Kaufman " "
S of H—1 elec. loco. Track gauge 42 in.
S of M—2 elec. mach.
PP—1 water tube boiler, 125 H. P., 1 gen. unit, 250 volts D. C.
EMP—50. Coke Ovens, 20 Bee Hive.
Began operation 12-15-15.

McCOY COAL CO.

McCoy Mine, Slope; "Pittsburg" Seam, 8 to 9 ft. thick.
PO—Fairmont, W. Va. CTY—Marion.
PR—Ernest McCoy, Fairmont, W. Va.
GM—Ernest McCoy, " " "
PA—Ernest McCoy, " " "
TR—Kathryn McCoy, " " "
MS—J. J. Ferrell, " " "
CE—W. Va. Eng. Co. " " "
S of H—Mules. Track gauge 42 in.
S of M—Hand.
PP—1 pump; power purchased.
EMP—4. Last fiscal year output 1,980 tons.
(Old information.)

McDOWELL COAL & COKE CO.

McDowell Mine; Drift; Poca. No. 3 Seam, 60 to 72 in. thick.
PO—McDowell, W.Va.; SP—North Fork, W.Va.; CTY—McDowell; RR—N. & W., North Fork Br.
PR—W. H. Thomas, Bramwell, W.Va.
TR—D. H. Thomas, ...Columbus, O.
GM—H. W. Rawson, McDowell, W.Va.
GS—H. W. Rawson, " "
PA—H. W. Rawson, " "
MS—E. W. Price, " "
EM—C. A. Brown, "
EE—E. L. Tate, " "
S of H—7 Elec., 1 steam loco. and mules; track gauge 44 in.
S of M—1 Elec. mach.
PP—6 Atlas return tubular boilers, total 850 H.P., 2 gen. units 500 volts D.C., 1 compressor, 2 pumps.
EMP—300. Coke ovens 100 Bee Hive. Last fiscal year output 260,000 tons.
Sales Agency, Flat Top Fuel Co., Bluefield, W. Va.

McGRAW COAL CO.

General Office, Frostburg, Md.
New York Mine, Drift, Pittsburgh Seam, 7 to 12 ft. thick.
PO—Simpson, W. Va. SP—Same. CTY—Taylor; RR—B. & O., Parkersburg Br.
PR—John T. McGraw, Grafton, W. Va.
TR—John Keating, Cumberland, Md.
GM—John S. Brophy,.. Frostburg, Md.
GS—John S. Brophy, " "
PA—Alex. G. Close, " "
EM—G. G. Townsend, " "
EE—Armett Love......Simpson, W. Va.
SM—Guy W. Davis, " "
MS—W. H. Sandridge, " "
S of H—4 Elec loco. Track gauge 42 in.
S of M—6 Elec. machines.
PP—2 Keeler return tubular boilers, total 300 H. P., 550 volts D. C. 1 pump.
EMP—61. Last fiscal year output 42,999.02 tons. Sales agent, S. J. Bohannon, New York City.

McGREGOR COAL CO.

General Office, Charleston, W. Va.
McGregor Nos. 1, 3 and 4 Mines, Drift, "Winifrede" Seam, 48 to 84 in. thick.
PO—Slagle, W. Va.; SP—Same; CTY—Logan; RR—C. & O., Run Creek Br.
PR—John Laing....Charleston, W. Va.
GM—John Laing " "
TR—James Martin, " "
GS—James Martin, " "
PA—C. F. Bailey.......Slagle, W. Va.
MS—C. F. Bailey, " "
SM—C. F. Bailey, " "
MM—H. E. Copeland, " "
CE—A. J. King..Charleston, W. Va.
SCO—McGregor Coal Co. Buyer, C. F. Bailey, Slagle, W. Va.
S of H—Mules and 7 elec. locos. Track gauge 48 in.
S of M—11 elec. mach.
PP—2 Keeler water tube boilers, total 600 H. P., 1 gen. unit, 250 volts D. C., 1 pump.
EMP—250. Last fiscal year output 232,982 tons.
Sales agent, Wyatt Coal Co., Charleston, W. Va.

McKELL COAL & COKE CO.

General Office, Glen Jean, W. Va.
PR—John D. McKell, Chillicothe, O.
TR—William McKell, Glen Jean,W.Va.
GM—Thomas Nichol..Glen Jean, W. Va.
PA—Thomas Nichol, " "
EM—V. S. Veazey, " "
MM—C. P. Gilmore, Kilsyth, " "
CE—T.W.Sprague, ... Boston, Mass.
Sales agency, C. G. Blake Co., Cincinnati, Ohio.

Kilsyth Mine, Drift, Sewell Seam, 4 ft. 4 in. to 6 ft. thick.
PO—Kilsyth, W. Va. SP—K. G., J. Va., CTY—Fayette; RR—K. G., J. & E.
MS—H. H. O'Neal, .. Kilsyth, W. Va.
SM—J. R. Craver, " " "
S of H—Mules, 6 elec. and 3 storage batteries. Loco. Track gauge 44 inches.
S of M—Hand and 5 Elec. mach.
PP—8 Return tubular boilers, total 1,400 H. P. 2 Gen units, 6,600 volts A. C. 3-phase, 25-cycle and 250 volts D. C.
EMP—302. Last fiscal year output 123,942 tons.

Graham Mine; Drift, Sewell Seam, 52 72 in. thick.
PO—Graham, W. Va.; SP—Same; CTY—Raleigh; RR—K. G. J. & E.
MS—C. C. Wood......Tamroy, W.Va.
S of H—Elec. loco. and mules.
S of M—Hand.
PP—Power from Kilsyth Mine.
Last fiscal year output 4,099 tons.

Tamroy Mine; Drift, Sewell Seam, 52 to 72 in. thick.
PO—Tamroy, W. Va.; SP—Same; CTY-Raleigh; RR—K. G. J. and E.
MS—C. G. Wood....Tamroy, W. Va.
S of H—10 Elec. loco.; track gauge 44 in.
S of M—3 Elec. mach.
PP—Power from Kilsyth Mine; 7 pumps.
Last fiscal year output 77,877 tons.

Oswald Mine; Drift; Sewell Seam 36 to 66 in. thick.
PO—Oswald, W. Va.; SP—Same; CTY—Raleigh; RR—K. G. J. & E.
MS—J. M. Hastings...Oswald, W. Va.
SM—E. A. Thornton, " "
S of H—Mules and 7 elec loco. Track gauge 44 in.
S of M—Hand and 5 Elec. mach.
PP—3 pumps. Power from Kilsyth Mine.
EMP—175. Last fiscal year output 991,443 tons.

Derryhale Mine, Drift, Sewell Seam, 4½ to 6 ft. thick.
PO—Derryhale, W. Va. SP—Same. CTY—Fayette; RR—K. G J. &
MS—Wm. Cockrane, Derryhale, W. Va.
SM—F. Cawley, " "
S of H—Mules and 2 elec. loco. Track gauge 44 inches.
S of M—Hand, and 3 elec machines.
PP—3 return tubular boilers, total 150 H. P. 1 Gen. unit 250 volts D. C. 4 pumps.
EMP—100. Last fiscal year output, 43,326 tons.

MADEIRA-HILL-CLARK COAL CO.

General Office, Fairmont, W. Va.
PR—Percy C. Madeira......Phila, Pa.
TR—Louis C. Madeira, " "
GM—W. R. Wilburn,....Philipsburg, Pa.
GS—C. J. Adams....Wilsonburg, W.Va.
PA—C. J. Adams, " "
EE—L. L. Waller, Wilsonburg, W.Va.

Waldo and Goff Mines; Drift; Pgh. Seam, 7 ft. thick.
PO—Wilsonburg, W.Va.; SP—Same; CTY—Harrison; RR—B. & O.
S of H—1 Gasoline motor and mules; track gauge 42 in.
S of M—Hand.
PP—Return tubular boiler, 100 H. P.
EMP—108. Last fiscal year output, 123,686.26 tons.

Randolph Mine; Drift; Pgh.; Seam, 7ft. thick.
PO—Wilsonburg, W. Va.; SP—Same; CTY—Harrison. RR—B. & O.
S of H—2 Elec. loco. and mules; track gauge 42 in.
S of M—5 Elec. and 7 comp. air mach.
PP—3 Return tubular boilers, total 400 H. P. gen. unit 200 K. W., 250 volts D. C., 1 compressor and 6 pupms.
EMP—125. Last fiscal year output, 109,040.18 tons.
Chiefton Mine idle.

MAGNOLIA COAL & COKE CO.

Magnolia Mine, Drift, Thacker Seam, 4 ft. thick.
PO—Matewan, W.Va..; SP—Same; CTY—Mingo. RR—N. & W.
PR—E. J. Corbett....Detroit, Mich.
PA—E. J. Corbett, " "
TR—J. F. Beavers....Matewan, W.Va.
GM—J. F. Beavers, " "
MS—G. T. Booth, " "
SM—A. G. Simpkins, " "
EM—D. M. Good....Williamson, W.Va.
S of H—Mules and 1 Gasoline loco., track gauge 48 in.
S of M—9 comp. air mach.
PP—2 Boilers, total 250 H. P. 1 air compressor.
EMP—83. Last fiscal year output 39,987 tons.
Sales Agent, E. J. Corbett, Detroit, Mich.

MAHER-PURSGLOVE MINING CO. (THE)

General Office, Cleveland, O.
1 Mine in W. Va., 1 Mine in Ohio.
No. 5 Mine; Drift, Island Creek Seam, 96 to 108 in.
PO—Chauncey, W. Va.; SP—Same; CTY—Logan; RR—C. & O., Logan Div.
PR—Thos. K. Maher....Cleveland, O.
TR—Joseph Pursglove, " "
GM—Samuel Pursglove, " "
GS—David Pursglove..St. Clairsville, O.
PA—J. H. Taylor,r....Chauncey, W.Va.
MS—J. H. Taylor, " "
MM—George W. Johnson, " "
EE—George W. Johnson, " "

SCO—The Maher-Pursblove Store Co. Chauncey, W. Va.
CE—R. A. McCall......Logan, W. V.a
S of H—2 Elec. motors and horses; track gauge 48 in.
S of M—4 Elec. mach.
PP—Power purchased; 3 pumps.
EMP—150.
New operation, first coal loaded March 27th, 1915.

MAIN ISLAND CREEK COAL CO.

General Office, Charleston, W. Va.
Opening 18 mines.
Main Island Creek Mine; Drift; Island Creek Seam, 84 to 102 in. thick.
PO—Omar, W. Va.; SP—Same;; CTY—Logan; RR—C. & O. L. & S. Br.
PR—John Laing....Charleston, W. Va.

VP—J. F. Johnson, " "
TR—O. O. Cooper......Hinton, W. Va.
GM—A. J. Dalton........Omar, W.Va.
PA—John A Kelly, " "
SUPT—John A. Kelly, " "
EM—J. H. Steidel, " "
MM—W. H. Dower, " "
EE—W. H. Dower, " "
MS—James Montgomery....Omar, W.Va.
CE—R. F. Carson....Huntington, W.Va.
SCO—Address the Company. Buyer, Thos. H. Brooks, Omar, W. Va.
S of H—25 elec. loco. Track gauge 48 in.
S of M—22 elec. mach.
PP—2 Boilers, total 600 H. P., 2 gen. units, 250 volts D. C. Purchase power.
EMP—800. Last fiscal year output 850,000 tons.
Sales Agency, Wyatt Coal Co.

MANBAR COAL CO.
Manbar Mine; Drift, No. 2 Gas Seam 60 to 66 in. thick.
PO—Manbar, W. Va.; SP—Same; CTY—Logan; RR—C. & O., G. Va. Br.
PR—H. L. Goodman..Thayer, W. Va.
TR—John K. Simpson....Ashland, Ky.
GM—J. S. Riley......Manbar, W.Va.
PA—J. S. Riley, " "
EM—W. C. McCall, ...Logan, W. Va.
SM—F. A. Ohlinger....Manbar, W. Va.
S of H—1 storage battery loco. and mules. Track gauge 48 in.
S of M—2 Elec. mach.
PP—Power purchased, 1 pump.
EMP—38. Last fiscal year output 37,608 tons.
Sales Mgr., J. S. Riley, Manbar, W.Va.

MARION GAS COAL CO.
General Office Turney Bldg., Greensburg, Pa.
Bingamon Mine, Drift, Fairmont Gas Coal Seam, 7½ ft. thick.
PO—Worthington, W. Va., SP—Enterprise, W. Va., CTY—Marion. RR—B. & O.
PR—J. C. Jamison.....Greensburg, Pa.
TR—J. R. Eisaman....Greensburg, Pa.
PA—Paul Johnson, " "
SCO—Marion Supply Co., Worthington, W.Va.
S of H—2 Elec. loco., track gauge 42 in.
S of M—4 Elec. mach. and hand mining
PP—Power purchased.
Sales agent, Paul Johnson, Greensburg, Pa.

MARMET COAL CO., (THE)
General Office, Cincinnati, Ohio.
Butler, Black Band, Monarch and Lens Creek Mines, Drifts, Black Band, Cedar Grove and Winifrede Seams, 4 to 4½ ft. thick.
PO—Hernshaw and Monarch, W. Va.; SP—Monarch, W. Va.; and Hernshaw, W. Va.; CTY—Kanawha; RR—K. & M., C. & O., and W. Va. & So.
PR—William Marmet....Cincinnati, O.
TR—Emil Herbrick, " "
GS—W. H. Stroube, " "
PA—Paul Wellinghoff, " "
GM—C. W. Poysell, Receiver, Cincinnati, O.
MS—Thos. Oliver......Marmet, W.Va.
EM—E. M. Green, " "
SCO—Marmet Coal Co. Store, Hernshaw, W. Va.
Marmet Coal Co. Store, Monarch, W.Va.
S of H—9 Elec. loco., track gauge
S of M—26 Elec. machines.
standard.
PP—7 boilers, total 800 H. P., 500 volts D. C. 16 Bee Hive coke ovens.
Sales Mgr., C. W. Poysell, Cincinnati, O.

MARSH FORK COAL CO.
General Office Charleston, W. Va.
Marsh Fork Mine, Drift, Coalburg Seam 5 ft. 6 in. to 5 ft. 8 in. thick.
PO—Marfork, W. Va.; SP—Marsh, W. Va.; CTY—Raleigh, RR—C. & O., Cabin Creek branch.
PR—T. E. B. Siler, Charleston, W.Va.
TR—W. H. Pettus, Jarrolds Valley W.Va
GM—W. H. Pettus, " " "
SM—R.C.Farrell, Jarrolds Valley,W.Va
MM—J. F. Blisard, " " "
EE—J. F. Blisard, " " "
EM—E. L. Colcord..St. Albans, W.Va.
S of H—2 Elec. loco., track gauge 42 in.
S of M—3 Elec. machines.
PP—2 Return tubular boilers, total 300 H. P., 250 volts D. C.
EMP—120.
Sales Mgr., J. L. Siler, Charleston, W. Va.

MARSHALL COAL CO.
General Office, 733 Land Title Bldg., Philadelphia, Pa.
Marshall Mine; Drift; Pittsburgh Coal Seam; 54 to 96 in. thick.
PO—Mt. Clare, W. Va.; SP—Byron, W. Va.; CTY—Harrison; RR—B. & O., W. Va. & Pittsburgh Branch.
PR—B. Dawson Coleman, Philadelphia, Pa.
GM—T. Dawson Coleman, Philadelphia, Pa.
TR—J. E. Wilkinson...Philadelphia, Pa.
PA—J. E. Wilkinson, " "
EM—F. M. McDaniel.Clarksburg, W.Va
MS—J. A. Jenkins.Clarksburg, W.Va.
MM—C. L. Frush....Mt. Clare, W. Va.
SM—Marshall Store Co. Buyer, A. M. Ridenour, Clarksburg, W. Va.
S of H—Mules and 3 gasoline loco. Track gauge 42 in.
S of M—16 comp. air mach.
PP—3 water tube boilers, total 400 H. P., 2 air comp., 6 pumps.
EMP—150.

MARY HELEN COAL COMPANY.
Mary Helen Nos. 1 and 2 Mines, Drift, Winifred and Thacker Seams; 4 to 6 ft. thick; operate washery.
PO—Hatfield, W. Va.; SP—Same; CTY—Mingo. RR—N. & W.
PR—C. E. Wilson..........Crewe, Va.
TR—T. C. Berger....Chattaroy, W.Va.
GM—S. V. Preston, " "
PA—T. C. Berger, " "
MS—W. H. Kirkpatrick, " "
SM—N. D. Anderson, " "
EM—N. H. Mannakee, Williamson, W.Va.
S of H—Mules and 6 elec. locos. Track gauge 48 in.
PP—3 Return tubular boilers total 400 H. P., 250 volts, D. C.; 5 pumps.
EMP—125. Last fiscal year output 101,000 tons.
Sales Agent, Elmer Miller Coal Co., Toledo, O.

MARYLAND COAL CO. OF W. VA.
PO—Simpson, W. Va. SP—Flemington, W. Va. CTY—Taylor.
No report.

MASTELLER COAL CO.
General Office, Keyser, W. Va.
PR—M. Masteller, Fredericksburg, Va.
TR—J. C. Watson......Keyser, W.Va.
Sec.—G. M. Loy, " "
GM—J C. Watson, " "
GS—F. H. Tibbetts, " "
PA—J. C. Watson, " "
EM—Wm. Harvey.......Frostburg, Md.
SCO—Mastellar Coal Co. Store Dept. Buyer, Wm. Randall, Keyser, W. Va. Sales Agent, Hampshire Mine only. Chas. E. H. Brown, Waynesboro, Pa.

Hampshire No. 1, No. 2 and No. 3 Mines; Drifts; Bakertown Seam, 24 to 48 in. thick.
PO—Beryl, W. Va., SP—Hampshire, W. Va., (no agent) CTY—Mineral. RR—Western Maryland, W.Va. Div.
MS—F. H. Tibbetts......Beryl W.Va.
S of H—1 Baldwin steam loco., and mules, track gauge 42 in.
S of M—Hand.
EMP—60. Last fiscal year output 49,000 tons.

New Creek Mine, Drift, Upper Kittanning Seam, 50 to 80 in. thick.
PO—Beryl, W. Va., SP—Hampshire, W. Va., (no agent) CTY—Mineral. RR—Western Maryland, W Va. Div.
MS—F. H. Tibbetts, Beryl, W. Va.
S of H—Mules.
S of M—Hand.
EMP—40. Last fiscal year output 37,000 tons.

M-B COAL & COKE CO.
General Office, Kimberly, W. Va.
PR—Mrs. Elizabeth O'Connor, Providence, R. I.
TR—Alfred S. Clarke..Providence, R. I.
GM—L. C. Tippett....Kimberly, W.Va.
GS—L. C. Tippett, " "
PA—L. C. Tippett, " "
CE—John C. Child...Charleston, W.Va.
MM—Will Robson ....Kimberly, W.Va.
Sales Agent, I. C. Tippett, Kimberly, W. Va.

Elkridge Nos. 1 and 2 Mines; Drifts; Incline; Powellton Seams; 5 to 6 ft. thick.
PO—Elkridge W. Va.; SP—Same; CTY—Fayette; RR—C. & O., Powellton Branch.
MS—(1) Lewis Hornsby, Elk Ridge, W. Va.
MS—(2) Tom Nunley, Elk Ridge, W. Va.
SM—W. M. Humphreys, Elk Ridge, W. Va.
S of H—2 elec. loco., mules and gravity, track gauge 44 in.
S of M—8 Elec. mach.
PP—Buy power. 1 rotary converter, 500 volts D. C.
Last fiscal year output 183,495 tons.

Kimberly No. 3, Columbia Nos. 4 and 5; Drift, Incline Kanawha No. 2 Gas and Kanawha Splint Block No. 5 Seams 4 to 7 ft. thick.
PO—Kimberly, W. Va.; SP—Same; CTY—Fayette; RR—C. & O., Powellton Branch.
MS—(3) W. D. Lee, Kimberly, W. Va.
MS—(5) W. W. Gill, " "
SM—J. F. Lewis,....Kimberly, W. Va.
S of H—1 elec., 3 gasoline loco, mules and gravity; track gauge 44 in.
S of M—6 Elec. mach. and hand.
PP—2 Jeffrey, return tubular boilers, total 300 H. P., 2 gen. units 500 volts D. C., 1 pump.
EMP—110. Last fiscal year output 50,000 tons.

MEAD-POCAHONTAS COAL CO.
Mine No. 1, Drift, Pocahontas No. 3 Seam, 48 to 56 in. thick.
PO—Mullens, W. Va., SP—Same, CTY—Wyoming; RR—Virginian Ry.
PR—Dr. J. A. Wood..Sullivan, W.Va.
EM—Fred G. Wood, " "
TR—J. C. Sullivan....Mullens, W.Va.
GM—J. C. Sullivan, " "
PA—J C. Sullivan, " "
MS—Jno. Prentice, " "
SCO—Mead Pocahontas Coal Co.
SM—C. C. Price......Mullens, W.Va.
S of H—Motor; track gauge 44 in.
S of M—Machine.
PP—50 volts D. C. (power purchased),
EMP—50. Last fiscal year output, 54,000 tons.
Sales Agents, C. & O. Coal Agency Co.
(Old information.)

MEAD-TOLIVER COAL CO.
Drift Mine; Beckley Seam; 60 to 84 in. thick.
PO—Eastgulf, W. Va.; CTY—Wyoming; RR—Virginian, Winding Gulf br.
PR—J. C. Sullivan......Tralee, W. Va.
TR—C. H. Mead, ...Otsego, W. Va.
GM—C. H. Mead, " "
PA—C. H. Mead, " "
EM—Philip Konrad, Kanawha Falls, W.Va.
GS—L. L. Martin....Eastgulf, W. Va.

MEADOW FORK COAL CO.
Meadow Fork Mine, Drift, Sewell or Loup Creek Seam, 3 ft. 10 in. to 6 ft. thick.
PO—Newlyn, W. Va. SP—Meadow Fork. CTY — Fayette. RR—C. & O., Loupcreek Branch.
PR—Edward Thomas..Newlyn, W. Va.
GM—Edward Thomas, " "
MS—Edward Thomas, " "
SM—Edw. A. Thomas, " "
PA—James H. Boyd, " "
EM—James H. Boyd, " "
S of H—Rope and 1 steam loco. Track gauge 44 in.
EMP—60. Last fiscal year output 26,000 tons.
Sales agency, West Va. Coal Co., Richmond, Va., C. C. Blake Coal Co., Cincinnati, Ohio.

MECCA COLLIERY CO.
New Kanawha Rail & River Co.

MERCHANTS COAL CO.
General Office, Pittsburgh, Pa.
Receivers, Thurston Wright and A. M. Bell, Pittsburgh, Pa.
2 Mines in Penna., 1 Mine in W. Va.
Tunnelton Mine; Drift, Up. Freeport Seam, 54 to 72 in. thick.
PO—Tunnelton, W. Va.; SP—Same; CTY—Preston; RR—B. & O., Main Line.
GS—John G. Gibson, Jr., Boswell, Pa.
EM—C. E. Hurd, " "
EE—Thomas Houlton, " "
PA—E. P. Payne......Pittsburgh, Pa.
CE—John M. Rayburn, " "
MS—W. S. Srodes....Tunnelton, W. Va.
MM—Noble Montgomery, " "
SCO—Penn Mercantile Co., " "
S of H—10 elec. loco. and mules. Track gauge 36 in.
S of M—7 elec. mach.
PP—4 Return tubular boilers, total 600 H. P., 3 gen. units 250 volts D. C.
EMP—250. Last fiscal year output 203,821 tons.

MICHIGAN COAL CO.
Michigan Mine, Drift, Sewell Seam.
PO—Fayette, W. Va. SP—Same. CTY—Fayette. RR—C. & O.
GM—Jas. D. Boone...Fayette, W.Va.
PA—Jas. D. Boone, " "
MS—Jas. D. Boone, " "
SM—Jas. D. Boone, " "
S of H—Mules.
S of M—Hand.
PP—Power purchased.
EMP—80.
(Old information.)

MIDLAND COAL & COKE CO.
Midland Mine, Shaft, Freeport Seam, 5 ft. 6 in. to 6 ft. thick.
PO—Philippi, W. Va. SP—Boylen, W. Va. CTY—Barbour. RR—B. & O., Berryburg Branch.
PR—W. P. Hurst......Scottdale, Pa.
GM—W. P. Hurst, " "
SCO—Midland Supply Co., Phillippi, W. Va.
S of H—1 elec. loco.
S of M—3 elec. mach.
PP—3 water tube boilers, 300 H. P., 1 gen. unit, 250 A. C., 3 pumps.
Coke ovens—101 Bee Hive.
Sales Mgr., W. P. Hurst, Scottdale, Pa.
(Old information.)

MIDVALE COLLIERY CO.
Midvale Mine, Drift, No. 5 Splint Seam, 5½ to 7 ft. thick.
PO—Gamoca, W. Va., SP—Same, CTY—Fayette; RR—C. & O., Gauley Br.
PR—C. W. Dillon, Fayetteville, W.Va.
TR—T. A. Deitz......Gamoca, W.Va.
GM—T. A. Deitz, " "
PA—T A. Deitz, " "
MS—C. H. Workman, " "
EM—Philip Konrad,Kanawha Falls,W.Va.
SCO—Midvale Store, Buyer, U. G. Thomas, Gamoca, W. Va.
S of H—Mules and 2 gasoline motors, track gauge 44 in.
S of M—Hand and 2 elec. mach.
PP—Power purchased.
EMP—100. Last fiscal year output, 65,000 tons.

MIFFLIN COAL MINING CO.
General Office, Clothier, W. Va.
Mifflin Nos. 1 and 2 Mines; Drifts; No. 2 Gas Seams; 52 to 56 in. thick.
PO—Clothier, W. Va.; SP—Mifflin; CTY—Logan; RR—C. & O., Coal River branch.
PR—M. E. Eakin......Grove City, Pa.
TR—Levi Deal, " "
GM—Levi Deal, " "
GS—Matthew Bowie,..Clothier, W. Va.
PA—Matthew Bowie, " "
MS—Matthew Bowie, " "
EM—Hugh Eaton....Charleston, W. Va.
EE—Bert Fisher,......Clothier, W. Va.
S of H—4 elec. locos. Track gauge 44 in.
S of M—4 elec. mach.
PP—Purchase power.

MILBURN COAL CO.
Milburn No. 1, Drift, Eagle Seam, 6 to 8 ft. thick.
PO—Milburn, W. Va., SP—Same, CTY—Fayette. RR—C. & O., Paint Creek Branch.
PR—P. M. McClanahan, Charleston,W.Va
TR—P. M. McClanahan, " "
GM—J. H. Morton....Milburn, W. Va.
PA—J. H. Morton, " "
EM—R. B. Whitaker.
MM—C. F. Cole......Milburn, W.Va.
SM—T. H. Dunbar......Milburn, W.Va.
S of H—7 elec. loco. Track gauge 44 in.
S of M—4 elec. mach.
PP—Buy power.
EMP—225. Last fiscal year output 199,342 tons.

MILL CREEK CANNEL MINING CO.
General Office, Charleston, W. Va.
Villa Mine; Drift; Cannel Seam; 3 to 7 ft. thick.
PO—Villa, W. Va., SP—Milliken, W. Va., CTY—Kanawha. RR—Coal & Coke Ry.
PR—J. H. Deegan...Charleston, W. Va.
GM—J. H. Deegan, " "
PA—J. H. Deegan, " "
GS—Fred Wattles, " "
TR—R. B. Taylor.....Cleveland, Ohio.
S of H—Mules and 1 steam loco., track gauge 42 in.
S of M—Shooting from solid.
PP—1 water tube boiler, 100 H. P., 1 air comp.
EMP—75. Last fiscal year output 12,000 tons.
Sales agents, Goff-Kirby Coal Co., Cleveland, O.

MILL CREEK COAL & COKE CO.
Mil Creek and Tug River Mines, Slope, Poco No. 3 Seam, 96 in. thick.
PO—Coopers, W. Va. SP—Same. CTY—Mercer. RR—N. & W.
PR—W. H. Thomas...Bramwell, W. Va.
TR—D. H. Thomas....Coopers, W. Va.
EM—D. C. Jones.....Bramwell, W. Va.
GS—J. W. Johnson.....Coopers, W. Va.
MF—J. T. Trail.......Coopers, W. Va.
SM—Lewis Straton, " "
S of H—Mules and 2 elec. locos.
S of M—Hand.
PP—9 boilers.
EMP—251.
Coke ovens, 59 Bee Hive.

MILL CREEK COLLIERY CO.
Mill Creek Mine; Shaft; Sewell Seam, 36 in. thick.
PO—Ansted, W.Va.; SP—Same; CTY—Fayette; RR—C. & O., Hawks Nest Br.
PR—Wm. N. Page,....Ansted, W.Va.
TR—W. H. Evans, " "
GM—W. H. Evans, " "
GS—R. H. Massey, " "
PA—R. H. Massey, " "
MS—R. H. Massey, " "
S of H—Mules.
S of M—12 Elec. mach.
Sales Agency, W. F. Smith Co., Cinnati, O.

MILLER POCAHONTAS COAL CO.
General Office, Mullins, W. Va.
Miller Poca Mine; Poca No. 3 Seam, 48 to 58 in. thick.
PO—Carinne, W. Va.; SP—Same; CTY—Wyoming; RR—Virginian, Winding Gulf branch.
PR—Jas. H. Miller, Hinton, W.Va.
TR—L. N. Frantz, ...Mullens, "
GM—J. H. Thomas " "
MS—H. L. Burke......Carinne, W. Va.
CE—Philip Konrad, Kanawha Falls, "
S of H—4 elec. locos.
S of M—1 elec. mach.
PP—2 pumps. Power purchased.
EMP—60. Last fiscal year output 24,000 tons.

MINERAL STATE COAL COMPANY

General Office, Baltimore, Md.

Parrs Run Mine, shaft; Pittsburgh No. 8 Seam; 66 to 84 in. thick.

PO—Moundsville, W. Va.; SP—Same; CTY—Marshall; RR—B. & O.

PR—Thomas T. Boswell. .Baltimore, Md.

TR—Edward Boswell, " "

GS—W. H. Morris. .Moundsville, W. Va.

PA—W. H. Morris, " "

MS—W. H. Morris, " "

CE—W. H. Morris, " "

S of H—Elec. locos. Track gauge 42 in.

S of M—5 elec. machs.

PP—2 water tube boilers, 1 gen. unit, 250 volts D. C.

EMP—125. Last fiscal year output 81,000 tons.

Note—Successors to Parrs Run Coal Co.

MODOC COAL MINING CO.

Sold to Turkey Gap Coal & Coke Co.

MOHAWK COAL & COKE CO.

General Office, Powhatan, W. Va.

Mohawk Mine; Drift; 60 to 72 in. thick.

PO—Mohawk, W. Va.; SP—Same (Prepay); CTY—McDowell; RR—N. & W.

PR—L. E. Tierney. . .Powhatan, W. Va.

GM—L. E. Tierney, " "

TR—L. H. Clarke. . . . . . . .Kyle, W. Va.

GS—J. L. Huddleston. . .Mohawk, W. Va.

PA—J. L. Huddleston, " "

MS—J. L. Huddleston, " "

MM—J. B. Williamson, " "

EM—C. C. Bailey. . . . . . .Davy, W. Va.

SCO—Mohawk Coal & Coke Co. Buyer, J. L. Huddleston, Mohawk, W. Va.

S of H—Mules and 1 elec. loco.

S of M—8 comp. air mach.

PP—4 Harrison water tube boilers, total 450 H. P., 1 compressor and 1 Turbo generator, 2200 volts A. C., and 250 volts D. C.

EMP—90. Last fiscal year output 85,500 tons.

MONITOR COAL & COKE CO.

Monitor Mine; Drift; Island Creek Seam; 6 ft. thick.

PO—Wilkinson, W. Va.; SP—Monitor Mines, W. Va.; CTY—Logan; RR—C. & O.

PR—G. W. Robertson. . . .Shamokin, Pa.

TR—C. K. Robertson, " "

GM—Thos. F. Downing, Wilkinson, W.Va.

GS—C. Z. Campbell, " "

PA—W. S. Keyser, " "

MS—Harry Barrett, " "

CE—W. F. McCall, " "

EM—W. F. McCall, " "

MM—Chas. Watts, " "

EE—J. B. Sterrett, " "

SM—W. S. Keyser, " "

S of H—7 elec. loco.

S of M—Elec. mach.

PP—4 Boilers, 3 gen. units, 250 volts, D. C.

MONONGAH FUEL CO.

Gallihue Mine, Drift, Pgh. Seam 5 to 9 ft. thick.

General Office, Monongah, W. Va.

PO—Monongah, W. Va.; SP—Kilarm; (prepay); CTY—Marion. RR—B. & O., Kilarm Br.

PR—David Victor. . . .Fairmont, W. Va.

GM—David Victor, " "

TR—Scott C. Lowe, " "

SM—Harry B. Killers, Monongah, W. Va.

S of H—Mules; track gauge 42 in.

S of M—Hand.

EMP—35. Last fiscal year output, 35,190 tons.

MONONGALIA COAL CO.

General Office, Fairmont, W. Va.

Monon No. 1 Mine; Drift; Sewickley Seam, 6 ft. thick.

PO—Beechwood, W. Va.; SP—Monon; CTY—Monongalia; RR—Monongahela

PR—A. P. Brady. . . . . .Fairmont, W.Va.

TR—S. D. Brady, Jr. . .Fairmont, W. Va.

PA—A. P. Brady, " "

GM—A. P. Brady, " "

MS—A. P. Brady, " "

CE—S. D. Brady, " "

EM—J. S. Henshaw, " "

S of H—Mules. Track gauge 42 in.

S of M—2 elec. mach.

PP—250 volts D. C., 1 pump.

EMP—50. Last fiscal year output 5,280 tons.

MONTO COAL COMPANY

PR—Paul Hardy. . . . . . .Ottawa, W. Va.

TR—R. P. Aleshire, " "

GM—J. M. Moore, " "

GS—J. M. Moore, " "

Big Eagle Mine; Shaft; Eagle Seam; 60 to 72 in. thick.

PO—Ottawa, W. Va.; SP—Same; CTY—Boone; RR—C. & O., Coal Run branch.

S of H—Gravity. Track gauge 44 in.

S of M—1 elec. mach.

PP—1 pump. Power purchased.

Mines Nos. 1 and 2; drifts; Eagle and No. 2 Gas Seams; 42 to 72 in. thick.

PO—Ottawa, W. Va.; SP—Same; CTY—Boone; RR—C. & O., Coal River branch.

S of H—Mules, 2 elec. locos., 1 storage battery, track gauge 44 in.

S of M—6 elec. mach.

PP—2 return tubular boilers, total 300 H. P., 1 gen. unit, 250 volts D. C., 1 pump.

EMP—125. Last fiscal year output 90,000 tons.

Mine No. 3; Shaft; Eagle Seam; 60 to 120 in. thick.

PO—Ottawa, W. Va.; SP—Same; CTY—Boone; RR—C. & O., Coal River branch.

S of H—Mules and elec. loco. Track gauge 44 in.

S of M—1 elec. mach.

PP—Buy power.

MORRIS FORK COAL CO.

General Office, Charleston, W. Va.

Turner Nos. 1 and 2 Mines; Drift, Kanawha; No. 5 Seam, 44 to 52 in. thick.

PO—Heatherman, W. Va.; SP—Turner, W. Va.; CTY—Kanawha RR—C. & C.

PR—J. D. Steele. . . .Charleston, W. Va.

TR—O. F. Payne, " "

GM—W. F. Mandt, " "

GS—J. L. Mandt, " "

CE—J. L. Mandt, " "

EM—George Evans. . . .Longacre, W. Va.

MS—Fred Mandt. . . .Heatherman, W. Va.

EE—Jas. Scott, " "

S of H—1 Elec. loco.

S of M—4 Elec. mach.

PP—2 Return tubular boilers, total 300 H. P., 1 Gen. unit 500 volts D. C.

EMP—75. Last fiscal year output 70,000 tons.

Sales Agency, Indian Run Coal Co.

MOUND CITY COAL COMPANY

General Office, 1000 First st., Moundsville, W. Va.

Receivers—Dollar Savings & Trust Co. of Wheeling, W. Va.

Mound Mine; Shaft; No. 8 Seam; 64 in. thick.

PO—Moundsville, W. Va.; SP—Same; CTY—Marshall; RR—B. & O.

GM—Robert Hazlet. . . .Wheeling, W. Va.

GS—Jos. Virgin. . . .Moundsville, W. Va.

PA—Jos. Virgin, " "

MS—Jos. Virgin, " "

MM—O. Connor, " "

EM—C. Smith. . . . . . .Wheeling, W. Va.

S of H—Mules and 1 elec. loco. Track gauge 36 in.

S of M—4 elec. mach.

PP—1 boiler, total 140 H. P., 2 gen. units, 250 volts D. C., 2 pumps.

EMP—140. Last fiscal year output 100,000 tons.

MT. CARBON CO., LTD.

Chair. Board of Dir., H. C. Newson, London, England.

TR—A. B. Seel, ...London, Eng.

GM—Goodwin H. Powel, Powellton, W. Va.

PA—Goodwin H. Powel, " "

GS—W. Ewart James, " "

EM—W. Ewart James, " "

SM—F. L. Evans, " "

Sales agency, Goodwin H. Powel, Powellton, W. Va.

Vulcan Mine; Drift, Powellton Seam, 60 to 90 in. thick.

PO—Powellton, W. Va.; SR—Same; CTY—Fayette; RR—C. & O.

MS—R. Thompson, . . Powellton, W. Va.

S of H—2 Elec. loco. and mules; racy gauge 36 in.

S of M—5 elec. mach. and hand.

PP—1 Rarig return tubular boilers, 150 H. P.; 2 gen. units 250 volts, D. C., 1 pump.

EMP—60 Coke ovens, 202 Bee Hive; Last fiscal year output 61,448 tons.

Pluto Mine; Drift, Kanawha Gas Seam; 48 to 56 in. thick.

PO—Powellton, W. Va. SP—Same; CTY—Fayette; RR—C. & O., Powellton Branch.

MS—R. Thompson, . . . Powellton, W. Va.

S of H—1 Elec. loco.; track gauge 42 in.

S of M—1 Elec. mach.

PP—1 Rarig return tubular boiler, 150 H. P.; 2 gen. units 250 volts D. C., 1 pump.

EMP—6; Just developing.

MOUNT HOPE COAL & COKE CO.

Baby Mine, Drift, Sewell Seam, 5 to 6 ft. thick.

PO—Mt. Hope, W. Va., SP—Macdonald, W. Va., CTY—Fayette. RR—C. & O. and Virginian.

PR—W. E. Deegan. . . .Mt. Hope, W.Va.

GM—A. D. Mosely, " "

GS—A. D. Mosely, " "

PA—A. D. Mosely, " "

MM—R. M. Shoemaker, " "

EM—H. B. Turner. . . .Glen Jean, W.Va.

SCO—Peoples Provision Co., Buyer, R. B. Yaple, Mt. Hope W. Va.

S of H—Rope and mules

S of M—Hand.

PP—1 Water tube 100 H. P. boiler, 1 gen. unit, 2 pumps.

EMP—65. Last fiscal year output 72,000 tons.

Sales Agent, S. T. Bailey, Mt. Hope, W. Va.

MULLENS SMOKELESS COAL CO.

Drift Mine; Pocahontas No. 3 Seam; 42 to 48 in. thick.

PO—Mullens, W. Va.; SP—Same; CTY—Wyoming RR—Virginian.

PR—L. N. Frantz. . . . . .Mullens, W. Va.

GM—L. N. Frantz " "

PA—Harry Harland, " "

TR—S. D. Frantz, " "

GS—H. A. Harland " "

EM—P. Konrad, Kanawha Falls, W. Va.

S of H—1 storage battery loco. Track gauge 44 in.

S of M—Hand.

PP—Buy power.

EMP—25. Last fiscal year output 11,500 tons.

UATIONAL BITUMINOUS COAL & COKE CO.

Now Central Coal Co.

NATIONAL COAL CO.

General Office, 51 S. Gay. st., Baltimore, Md.

National Mine, Drift, Pittsburgh Seam, 6 to 8 ft. thick.

PO—Dola, W. Va., SP—Same, CTY—Harrison. RR—W. Va., Short Line, B. & O. RR.

PR—Augustine J. Ryan . .Baltimore, Md.

TR—Augustine J. Ryan, " "

GM—John F. O'Meara " "

Mine shut down since Aug., 1914.

NATIONAL COAL MINING COMPANY

General Office, Pittsburgh, Pa.

Polars 1 & 2 Mines; Drift; Redstone & Pittsburgh Seams; 66 to 72 in. thick.

PO—McWhorter, W. Va.; CTY—Harrison; SP—Jane Lew, W. Va.; RR—B. & O.

PR—C. R. Wilson. . . . . .Pittsburgh, Pa.

TR—J. M. Hamilton, Jr., McWhorter, W. Va.

GM—J. M. Hamilton, Jr., McWhorter, W. Va.

PA—J. M. Hamilton, Jr., McWhorter, W. Va.

SM—J. M. Hamilton, Jr., McWhorter, W. Va.

CE—H. C. Burchinal. . . .Uniontown, Pa.

GS—T. Starr. . . . . .McWhorter, W. Va.

SCO—National Supply Co.

S of H—Mules, rope, and gasoline loco. Track gauge 42 in.

S of M—Hand.

Output for two months, 10, 776 tons.

Successors to Burrows Coal Co.

NATIONAL FUEL CO.

General Office, Pittsburgh, Pa.

Polar Mine; Drift; Redstone and Pittsburgh Seam; 72 in. thick.

PO—McWhorter, W. Va.; SP—Same; CTY—Harrison; RR—B. & O.

PR—J. M. Hamilton, Jr. McWhorter, W. Va.

TR—J. M. Hamilton, Jr., McWhorter, W. Va.

GM—J. M. Hamilton, Jr., McWhorter, W. Va.

GS—J. M. Hamilton, Jr. " "

PA—J. M. Hamilton, Jr. " "

MS—Tony Starr, McWhorter, W. Va.

EM—Homer Burchinal, Uniontown, Pa.

SCO—Polar Supply Co., McWhorter, W. Va.

S of H—Rope and mules.

S of M—Hand.

EMP—65. Last fiscal year output 80,000 tons. Sales agent National Fuel Co., Oliver Bldg., Pittsburgh, Pa.

NAUGATUCK COAL CO., THE

General Office, Cincinnati, O.

Naugatuck Mine; Drift; Coalburg Seam; 52 in. thick.

PO—Blocton, W. Va.; SP—Same; CTY—Mingo; R—N. & W.

PR—H. A. Bayless. . . . . .Cincinnati, O.

TR—Froome Morris, " "

GS—L. J. Blankenship. .Blocton, W. Va.

PA—L. J. Blankenship, " "

EM—D. M. Good. . .Williamson, W. Va.

MM—L. E. Valentine. . .Blocton, W. Va.

EE—L. E. Valentine. " "

MS—B. F. Bray, " "

SM—Jas. H. Varney, " "

S of H—2 Elec. and 1 Steam loco; track gauge, 44 in.

S of M—5 elec. mach.

PP—3 Return tubular boilers, 450 H. P., gen. units, 250 volts D. C.; 1 air comp., 2 pumps.

EMP—125. Last fiscal year output 110,000 tons.

Sales Agency, The Blue Ash Coal Co., Cincinnati, O.

NEWCOMER COAL CO.

General Office, Scottdale, Pa.

Newcomer Mine; Drift; Pittsburgh Seam, 72 to 78 in. thick.

PO—Teter, W. Va.; SP—Same; CTY—Upshur; RR—B. & O., Buckhannon Branch.

PR—W. P. Hurst. . . . . . . .Scottdale, Pa.

TR—R. H. Parker, " "

GM—R. H. Parker, " "

SM—O. F. Hodges. . . . . . . .Teter, W.Va.

Note—Mine closed at preesnt.

NEWLYN COAL CO.

Thomas Mine; Drift; Fire Creek Seam; 36 in. thick.

PO—Newlyn, W. Va. SP—Thurmond, W. Va. CTY—Fayette. RR—C. & O.

GM—Edward Thomas. . . .Newlyn, W.Va.

PA—James H. Boyd, " "

EM—James H. Boyd, " "

MS—H. P. Thomas, " "

SM—E. A. Thomas, " "

S of H—Mules and rope and Storage battery loco.

S of M—Hand.

PP—Boiler, 25 H. P.

EMP—60. Last fiscal year output 22,000 tons.

NEW EXPORT COAL COMPANY

General Office, Charleston, W. Va.

Shaft; No. 2 Gas Seam; 60 to 78 in. thick.

PO—Charleston, W. Va.; SP—Dana, W. Va.; CTY—Kanawha; RR—H. & M., Campbell's Creek branch.

PR—Patrick Gilday. . . . .Morrisdale, Pa.

GM—J. L. Williams, Chharleston, W. Va.

S of H—Locomotive.

S of M—One elec. mach.

PP—2 pumps.

NEW POCAHONTAS COAL COMPANY

New Pocahontas Mines Nos. 1 and 2; Drifts; Pocahontas No. 6 Seam; 48 in. thick.

PO—Mine No. 1, Deegans, W. Va.; SP—Same; CTY—McDowell; RR—N. & W.

Mine No. 2, Welch, W. Va.; SP—Hemphill; CTY—McDowell; RR—N. & W.

PR—W. E. Deegans. .Huntington, W. Va.

GM—W. E. Deegans, " "

PA—John Faulkner, " "

TR—J. M. Turner. . . . . .Welch, W. Va.

MS—No. 1 Mine, J. H. Taylor, Deegans, W. Va.

MS—No. 2 Mine, J. W. Wedgewood, Welch, W. Va.

EM—G. J. Cooper, " "

MM—J. B. Hamm. . . . .Deegans, W. Va.

EE—J. B. Hamm, " "

SCO—Address the Company. Buyer, No. 1 Mine—T. A. Musser, Deegans, W. Va. Buyer, No. 2 Mine—J. H. Bishop, Welch, W. Va.

S of H—6 elec. and 2 storage battery locos. Track gauge 48 in.

S of M—2 elec. machs.

EMP—350. Last fiscal year output 150,000 tons.

NEW REX COAL & COKE CO.

General Office, Huntingdon, W. Va.

Rex Mine, Drift, Winfiede Seam, 4 ft. 9 in. to 5 1-3 ft. thick

PO—Ethel, W. Va., SP—Same, (prepay) CTY—Logan RR—C. & O. RR., Guyan Valley Branch.

PR—L. R. Reese. . .Huntingdon, W. Va.

TR—Geo. S. Wallace " "

GM—F. H. McClurg . . .Ethel, W. Va.

PA—F. H. McClurg " "

SM—Wylie Agnew, " "

S of H—Mules and 1 elec. and 1 storage battery loco. Track gauge 44 in.

S of M—4 elec. mach.

PP—2 Atlas and H. S. & G. boilers, total 300 H. P., 1 gen unit 250 volts D. C., 1 air comp. and 3 pumps.

EMP—105.

Sales Agent, Producers Coal Co., Cincinnati, O.

NEW RIVER CO.

General Office, Macdonald, W. Va.

PR—R. H. Gross. . . . . . . .Boston, Mass.

TR—F. B. Dowst. . . . .Macdonald, W.Va.

GM—S. A. Scott, " "

GM—Asst., P. C. Thomas, " "

PA—M. C. Moore, " "

EM—C. E. Bergendohl, " "

Supt of Stores—E. M. Tutwiler, Macdonald, W.Va.

CE—Randolph-Means Co., Pittsburgh, Pa.

MM—J. T. Evans. . . . . .Carlisle, W.Va.

Sales Agency, White Oak Coal Co., Macdonald, W. Va.

CRANBERRY FUEL CO.

Cranberry Mine; Shaft; Sewell Seam, 48 to 51 in. thick.

PO—Cranberry, W. Va.; SP—Prosperity, W. Va.; CTY—Raleigh; RR—C. & O., Piney Branch.

MS—A. H. Shafer. . . . .Cranberry, W.Va.

S of H—Mules and 3 Elec. loco; track gauge 40 in.

S of M—6 Elec. mach.

PP—Power purchased.

EMP—215. Last fiscal year output 154,324 tons.

Sprauge Mine; Slope; Sewell Seam 46 to 48 in. thick.

PO—Sprague, W. Va.; SP—Same; CTY—Raleigh; RR—C. & O., Piney Br.

MS—W. E. Griffith. . . .Mabscott, W.Va.

S of H—Mules and 1 Elec. loco.; track gauge 40 in.

S of M—Hand and 2 Elec. mach.

PP—Purchase power.

EMP—216. Last fiscal year output 122,602 tons.

Skelton Mine; Slope; Sewell Seam; 48 to 66 in. thick.

PO—Skelton, W. Va.; SP—Same; CTY—Raleigh; RR—C. & O. and Virginian, P. R. & P. C. branch.
MS—A. H. Shafer...Cranberry, W. Va.
S of H—Mules, rope and 2 elec. locos. Track gauge 44 in.
S of M—2 elec. mach.
PP—1 pump. Purchase power.
EMP—65.

STUART COLLIERY CO.

Lochgelly Mine; Shaft; Sewell Seam 46 to 54 in. thick.
PO—Lochgelly, W. Va.; SP—Same; CTY—Fayette; RR—C. & O. and Virginian, White Oak Br.
MS—J. R. Porter....Lochgelly, W. Va.
..**S of H**—Mules and 8 Elec. loco.; track gauge 40 in.
S of M—Hand and 7 Elec. mach .
PP—Power purchased.
EMP—175. Last fiscal year output 121,823 tons.

Summerlee Mine; Shaft; Sewell Seam; 44 to 55 in. thick.
PO—Summerlee, W. Va.; SP—Same; CTY—Fayette; RR—C. & O., and Virginian, White Oak Br.
MS—J. P. Porter.....Lochgelly, W. Va.
S of H—Mules and 6 Elec. loco.; track gauge 40 in.
S of M—Hand and 8 Elec. mach.
PP—Purchase power.
EMP—170. Last fiscal year output, 116,963 tons.

MABSCOTT COAL & COKE CO.

Mabscott Mine; Drift; Sewell Seam; 44 to 53 in. thick.
PO—Mabscott, W. Va.; SP—Same; CTY—Raleigh; RR—C. & O., and Virginian, Piney Br.
MS—W. E. Griffith....Mabscott, W.Va.
S of H—Rope and 1 Elec. loco; track gauge 42 in.
S of M—Hand.
PP—Purchase power.
EMP—173. Last fiscal year output 101,420 tons.

MACDONALD COLLIERY CO.

Macdonald Mine; Drift; Sewell Seam; 49 to 67 in. thick.
PO—Macdonald, W. Va.; SP—Same; CTY—Fayyette; RR—C. & O., Loup Br.
MS—John Porter.....Macdonald, W.Va.
S of H—Mules and 4 Elec. loco.; track gauge 44 in.
S of M—Hand and 7 Elec. mach.
PP—Purchase power.
EMP—185. Last fiscal year output 75,879 tons.

HARVEY COAL & COKE CO.

Harvey Mine; Dirft; Sewell Seam; 56 to 64 in. thick.
PO—Harvey, W. Va.; SP—Same; CTY—Fayette; RR—C. & O., Loup Creek Branch.
MS—John Whitehead.....Harvey, W.Va.
S of H—Mules and 4 Elec. loco.; track gauge 44 in.
S of M—Hand and 7 Elec. mach.
PP—Purchase power.
EMP—300 Last fiscal year output 219,422 tons.

DUNN LOOP COAL & COKE CO.

Dunn Loop Mine; Driftl; Sewell Seam; 59 to 76 in. thick.
PO—Dunn Loop, W. Va.; SP—Same; CTY—Fayette; RR—C. & O., Loup Creek Br. & K. G. J. & E.
MS—John Porter.....Macdonald, W.Va.
S of H—Mules and 10 Elec. loco.; track gauge 44 in.
S of M—Hand and 4 Elec. mach.
PP—Purchase power.
EMP—312. Last fiscal year output, 219,078 tons.

COLLINS COLLIERY CO.

Collins Mine; irDft; Sewell Seam; 48 to 58 in. thick.
PO—Glen Jean, W. Va.; SP—Same; CTY—Fayette; RR—C. & O., Loup Creek Br.
MS—J. L. Osler....Glen Jean, W. Va.
S of H—Mules and 7 Elec. loco.; track gauge 44 in.
S of M—Hand and 4 Elec. mach.
PP—Purchase power.
EMP—160. Last fiscal year output, 107,432 tons.

BECKLEY COAL & COKE CO.

Beckley Mine; Slope; Sewell Seam; 46 to 50 in. hick.
PO—Wickham, W. Va.; SP—Bickel, W. Va.; CTY—Raleigh; RR—C. & O., and Virginia, Piney Br.
MS—W. E. Griffith....Mabascott, W.Va.
S of H—Rope, Mules and 5 Elec. loco.; track gauge 36 in.
S of M—Hand and 3 Elec. mach.
PP—Purchae power.
EMP—160. Last fiscal year output 100,880 tons.

PRUDENCE COAL & COKE CO.

Prudence Mine; Drift; Sewell Seam; 48 to 54 in. thick.
PO—Prudence, W. Va.; SP—Same; CTY—Fayette; RR—C. & O., Loup Creek Br.
MS—John Whitehead.....Harvey, W.Va.
S of H—Mule and 5 Elec. loco.; track gauge 44 in.
S of M—Hand and 2 Elec. mach.
PP—Purchase power.
EMP—220. Last fiscal year output, 147,396 tons.

WHITE OAK FUEL CO.

Oakwood Mine; Shaft; Sewell Seam; 40 to 51 in. thick.
PO—Carlisle, W. Va.; SP—Same; CTY—Fayette; RR—C. & O., White Oak Branch.
MS—John Black.......Carlisle, W. Va.
S of H—Mules and 4 Elec. loco.; track gauge 40 in.
S of M—Hand and 7 Elec mach.
PP—Purchase power.
EMP—270. Last fiscal year output, 175,366 tons.

Scarbro Mine; Shaft; Sewell Seam; 47 to 71 in. thick.
PO—Scarbro, W. Va.; SP—Same; CTY—Fayette; RR—C. & O., White Oak Branch.
MS—Jos. Roncaglione...Scarbro, W. Va.
S of H—Mules and 14 Elec. loco.; track gauge 40 in.
S of. M—Hand and 11 Elec. mach.
PP—Purchase power.
EMP—290. Last fiscal year output, 205,367 tons.

Whipple Mine; Shaft; Sewell Seam; 47 to 55 in. thick.
PO—Whipple, W. Va.; SP—Scarbro, W. Va.; CTY—Fayette; RR—C. & O., White Oak Br.
MS—John Black......Carlisle, W. Va.
S of H—Mules and 7 Elec. loco.; track gauge 44 in.
S of M—Hand and 5 Elec. mach.
PP—Purchase power.
EMP—165. Last fiscal year output, 101,014 tons.

NEW RIVER COLLIERIES CO.

General Office, Sun, W. Va.
PR—J. K. MacGowan, 120 Broadway, N. Y.
TR—L. E. Arnott, 120 Broadway, N. Y.
PA—J. K. MacGowan, 120 Broadway, N. Y.
CE—H. W. York, 120 Broadway, N. Y.
GM—F. P. Bayles,.....Eccles, W. Va.
GS—M E. Kent.........Sun, W.Va.
Asst. Supt.—Thos. Donelson, Eccles,W.Va
EM—R. J. Burmeister, " "
MM—Wm. Harler, " "
EE—T. P. Kirk, " "
SCO—J. Anthony (Buyer) " "
Sales Agent, O. W. Gardner, Norfolk, Va.

Eccles No. 3 and Eccles No. 5, Shafts, Beckley Seam, 7 ft. thick.
PO—Eccles, W. Va., SP—Same, CTY—Raleigh. RR—C. & O., Piney Br. and Virginian.
MS—Thos. Donelson.....Eccles, W.Va.
S of H—Mules and 15 elec. loco., track gauge 44 in.
S of M—Pick and 11 elec. machines.
PP—2 Heine water tube and 4 Erie City return tubular boilers, total 1000 H. P., 4 gen. units, 3 500 volts D. C., 1 2300 volts A. C., 8 pumps.
Last fiscal year output 580,000 tons.

Eccles No. 6, Shaft, Sewell Seam, 5 to 6 ft. thick.
PO—Eccles, W. Va., SP—Same, CTY—Raleigh. RR—C. & O., Piney Br. and Virginian.
MS—Thos. Donelson....Eccles, W.Va.
S.of H—2 elec. loco. and mules, track gauge 44 in.
S of M—Pick.

Sun Mine, Shaft and Slope, Sewell Seam, 3½ to 6 ft. thick.
PO—Sun, W.Va., SP—Same, CTY—Fayette. RR—Loup Creek Branch, C. & O., K. G. J. & E. R. R.
MS—M. E. Kent........Sun, W.Va.
S of H—Mules and 10 elec. loco., track gauge 44 in.
S of M—Pick and 7 elec. machines
PP—4 Erie City water tube boilers, total 1200 H. P., 2 gen. units 550 volts D. C., 4 pumps
EMP—400. 120 Bee Hive coke ovens. Last fiscal year output 430,000 tons.

NEW RIVER AND POCAHONTAS CONSOLIDATED COAL CO.

General Office, Philadelphia, Pa.
PR—John E. Berwind, New York City
TR—E. H. Sanborn, Philadelphia, Pa.
PA—W. W. Whitney, " "
FE—George R. Wood, Philadelphia, Pa.
GS—H. M. Bertolet, Charleston, W.Va.
EM—G. S. Borden, " "
SCO—New River & Pocahontas Stores, Buyer, Bert Atwell, Berwind, W.Va.
Sales Agency, Berwind-White Coal Mining Co., Phila., Pa.

Berwind Mines, Drifts, Pocahontas No. 3 Seam, 3 to 4 ft. thick. Operate washery.
PO—Berwind, W. Va., SP—Same, CTY—McDowell. RR—Norfolk & West.
MS—William Barrick..Berwind, W.Va.
SM—R. M. Homan, " "
S of H—34 elec. loco. Track gauge 44 in.
S of M—Hand and 34 elec. mach.
PP—3 Sterling water tube boilers, total 1500 H. P., 2 gen. units 550 volts D. C., 6 pumps. Purchase power.
EMP—900. 200 Bee Hive coke ovens. Last fiscal year output 534,832 tons.

Havaco Mines Shaft, Pocahontas No. 3 Seam 5 ft. thick.
PO—Havaco, W. Va., SP—Same, CTY—McDowell. RR—Norfolk & West.
MS—R. Y. Muir.......Havco, W. Va.
SM—W. C. Lane, " "
S of H—8 elec. loco. Track gauge 48 in.
S of M—9 elec. mach. and hand.
PP—3 Sterling water tube boilers, total 850 H. P., 2 Gen. units 300 volts D. C., 2 pumps. Purchase Power.
EMP—250. Last fiscal year output 181,582 tons.

Minden Mines, Drifts, Sewell Seam, 4 ft. thick.
PO—Minden, W. Va. SP—Same. CTY—Fayette. RR—Chesapeake & Ohio.
MS—John Clapperton, Jr., Minden, W. Va.
SM—C. E. Summers, " " "
S of H—28 elec. loco. Track gauge 42 in.
S of M—24 elec. mach. and hand.
PP—4 Sterling water tube boilers, total 1,200 H. P., 300 to 600 volts, D. C., 6 pumps; purchase power.
EMP—1,100. Last fiscal year output 673,323 tons.

Layland Mines, Drifts, Fire Creek Seam, 4 ft. thick.
PO—Layland, W. Va. SP—Same. CTY—Fayette. RR—C. & O.
MS—Oscar Knerr, ... Layland, W. Va.
SM—James E. Crickmer, " " "
S of H—23 Elec. loco. Track gauge 44 in.
S of M—Hand.
PP—3 Sterling water tube boilers, total 900 H. P. 3 Gen. units 300 volts D. C. 4 pumps.
EMP—375. Last fiscal year output, 286,720 tons.

Weirwood Mines, Shaft, Sewell Seam, 4 ft. tihck.
PO—Herberton, W. Va. SP—Weirwood, W. Va. CTY—Fayette. RR—Virginian.
MS—John Clapperton, Jr., Minden, WVa.
SM—F. A. Seward Herberton, " "
S of H—2 Elec. loco.; track gauge 44 in.
S of M—Hand and 3 Elec. mach.
PP—1 Walsh Weidner 100 H. P. boiler. Also purchase power.
EMP—200. Last fiscal year output 58,160 tons.

NEWTON, J. M. & D. E. COMPANY

Sliding Hill Mine; Slope; Pittsburgh No. 8 Seam; 58 to 62 in. thick.
PO—Hartford, W. Va.; SP—Same; CTY—Mason; RR—B. & O.
PR—D. E. Newton.....Hartford, W. Va.
TR—D. E. Newton, " "
GM—W. H. Newton, " "
GS—W. H. Newton, " "
PA—D. E. Newton, Jr. " "
SM—D. E. Newton, Jr. " "
MS—John Roy, " "
MM—J. F. Ginther, " "
EE—C. Bumgarner, " "
SCO—Hartford City Salt Co.
S of H—1 elec. loco. Track gauge 39 in.
S of M—2 elec. mach.
PP—1 return tubular boiler, total 150 H. P., 1 gen. unit, 250 volts D. C., 1 pump, and purchase power.
EMP—42. Last fiscal year output 17,500 tons.

NICHOL COLLIERY CO.

Nichol Mine, Slope, Sewell Seam, 4 to 6 ft. thick.
PO—Glen Jean, W. Va. SP—Same. CTY—Fayette. RR—C. & O., Loup Creek Branch. Virginian & K. G. J. & E.
PR—Thomas Nichol, Glen Jean, W. Va.
TR—O. F. McCoy, " " " "
GM—Thomas Nichol, " " " "
PA—Thomas Nichol, " " " "
MS—F. P. Smith, " " " "
EM—O. A. Vrayer, " " " "
EE—John Hilton, " " " "
SCO—Nichol Colliery Company's Store Buyer, O. F. Richeson, Glen Jean, W. Va.
S of H—5 elec. loco. and conveyor. Track gauge 44 inches.
S of M—4 Elec. machines.
PP—2 Return tubular boilers, total 300 H. P. 2 Gen. units 250 volts D. C. 2 pumps.
EMP—75. Last fiscal year output, 45,600 tons.

NORTH AMERICAN COAL CO .OF VA.

General Office, Morgantown, W. Va.
Maidsville Mine; Drift; Pittsburgh, Redstone and Sewickley Seams; 66 to 120 in. thick.
PO—Morgantown, W. Va.; SP—Maidsville, W. Va.; CTY—Monongalia; RR—Monongalia.
PR—Louis H. Brown, 17 Battery Place, N. Y. City.
GM—Louis H. Brown, 17 Battery Place, N. Y. City.
TR—A. P. Flaglor, 17 Battery Place, N. Y. City.
GS—C. D. Junkins..Morgantown, W. Va.
MS—C. D. Junkins, " "
EM—G. B. Hartley, " "
SCO—Maidsville Store Co. Buyer, J. E. Werkman, Morgantown, W. Va.
S of H—Mules and incline. Track gauge 42 in.
S of M—Hand.
EMP—75.

NUTTALLBURG SMOKELESS FUEL CO.

General Office, Macdonald, W. Va.
Nuttall Mine; Drift; Sewell Seam.
PO—Nuttallburg, W. Va.; SP—Nuttall; CTY—Fayette; RR—C. & O.
PR—Alex McNabb...Macdonald, W. Va.
GM—Alex McNabb, " "
TR—J. H. Pirrung, " "
GS—M. M. Tyree...Nuttallburg, W. Va.
PA—M. M. Tyree, " "
MS—M. M. Tyree, " "
EE—J. E. Davis, " "
CE—Philip Konrad, Kanawha Falls, W. Va.
EM—Philip Konrad, " "
SCO—Nuttallburg Smokeless Fuel Co. Store. Buyer, W. H. Mann, Nuttalburg, W. Va.
S of H—5 elec. locos.
S of M—6 elec. mach.
PP—Purchase power.
EMP—150. Last fiscal year output 85,000 tons. 65 Bee Hive coke ovens.

OAK FOREST COAL CO.

Oak Forest Mine, Slope, Pittsburgh Seam, 3 ft. 8 in. to 4 ft. 2 in. thick.
PO—Winfield, W. Va. SP—Red House, W Va. CTY—Putnam. RR—K. & M.
PR—C. C. Bowyer, Pt. Pleasant, W. Va.
TR—E. E. Thomas, " " " "
GM—D. L. Thomas, Winfield, " "
GS—D. L. Thomas, " " "
PA—D. L. Thomas, " " "
MM—R. G. Thomas, " " "
EE—R. G. Thomas, " " "
EM—M. G. Tyler, Spilman, " "
SCO—Oak Forest Coal Co. Buyer D. L. Thomas, Winfield, W. Va.
S of H—Rope and elec. loco. Track gauge 36 in.
S of M—4 Elec. machines.
PP—1 Return tubular 150 H. P. boiler, 250 volts D. C. 1 pump.
(Old information.)

OPPERMAN COAL CO., (THE)

Mine, Drift, No. 2 Gas Seam, 7 ft. thick.
PO—Blair, W. Va. SP—Same. CTY—Logan. RR—St. Alben Branch of C. & O.
PR—J. H. Opperman,.. Cambridge, O.
TR—J. H. Opperman, " "
GM—J. H. Opperman, " "
GS—C. L. Walkenshaw...Blair, W. Va.
PA—C. L. Walkenshaw, " "
EM—Alfred Thomas......Blair, W.Va.
MM—John Arbaugh, " "
SM—S. Shirkey, " "
S of H—1 elec. loco. and mules. Track gauge 44 in.
S of M—2 elec. mach.
PP—250 volts D. C. Power purchased.
EMP—80. Last fiscal year output, 60,000 tons.
Sales agent, N. O. Gray, 756 Penobscott Bldg., Detroit, Mich.

OREGON COAL CO.

Oregon Coal Co. Mine, Drift, Welch Seam, 3½ to 5 ft. thick.
PO—Hemphill, W. Va. SP—Welch, W. Va. CTY—McDowell. RR—N. & W.
PR—J. C. Pack........Freeman, W.Va.
GM—J. C. Pack, " "
EM—D. C. Jones, " " "
TR—I. J. Rhodes, Welch, " "
GS—E. W. Price.....Hemphill, W. Va.
PA—H. N. Fix, " " "
SM—H. D. Peters....Hemphill, W. Va.
SCO—Oregon Coal Co. Buyer, N. D. Peter, Hemphill, W. Va.
S of H—Mules, 1 elec. loco. and 1 steam loco. Track gauge 48 in.
S of M—Pick and 3 elec. mach.
PP—Buy power.
EMP—200. Last fiscal year output 82,868 tons.
Sales Agent Pocahontas Fuel Co., New York.

ORINOCO MINING CO.

Orinoco Mine; Drift; Freeburn Seam, 52 to 60 in. thick.
PO—Williamson, W. Va.; SP—Orinoco Siding, W. Va., in Pike City, Ky.; RR—Williamson & Pond Creek.

(Continued on Next Page.)

Orinoco Mining Co.—Cont.
PR—J. E. Rhodemyre.....Orinoco, Ky.
GM—J. E. Rhodewyre, " "
PA—J. E. Rhodemyre, " "
TR—L. A. Dunn.......Bluefield, W.Va.
EM—N. H. Mannaker, Williamson, W. Va.
MS—B. Followay.........Orinoco, Ky.
SM—G. C. Wray, " "
S of H—Mules and 1 elec. loco. Track gauge 48 in.
S of M—Hand and 1 elec. mach.
EMP—26 to 50. Output 1,024 tons. Just developing.
Sales Agency, Bluefield Coal & Coke Co., Bluefield, W. Va.

ORR COAL COMPANY

General Office Wilsonburg, W. Va.
Miller Mine; Drift; Pittsburgh Seam; 84 to 108 in. thick.
PO—Wilsonburg, W. Va.; SP—Same; CTY—Harrison; RR—B. & O.
PR—J. M. Orr.....Wilsonburg, W. Va.
GM—J. M. Orr, " "
PA—J. M. Orr, " "
TR—L. J. Robb........Pittsburgh, Pa.
MS—H. M. Sipe....Wilsonburg, W. Va.
MF—David Wilkins, " "
MM—E. B. Irwin, " "
EE—E. B. Irwin, " "
EM—Horner Brothers, Clarksburg, W. Va.
SCO—Standard Supply Co., Wilsonburg, W. Va.
S of H—Mules and one 12 ton steam loco. Track gauge 42 in.
S of M—2 elec. mach.
PP—Purchase power.
EMP—61. Last fiscal year output 88,400 tons.

OTTO MARMET COAL & MINING CO.

Big Otto Nos. 1, 2 and 3 Mines, Drifts, Pgh. Seam, 6 ft. thick.
PO—Raymond City, W. Va. CTY—Putnam.
GM—Otto Reemelin, Raymond City, W.Va.
MS—Otto Reemelin, " "
S of H—4 elec. loco. and mules.
S of M—Hand.
EMP—310.

PAGE COAL & COKE CO.

General Office, 1503 North American Bldg., Philadelphia, Pa.
Page Mine; Drift; Poca No. 3 Seam, 72 to 144 in. thick.
PO—Pageton, W. Va.; SP—Same; CTY—McDowell; RR—N. & W., Tug Fork Branch.
PR—Louis R. Page....Philadelphia, Pa.
TR—Louis R. Page, " "
GM—E. H. Evans.....Pageton, W. Va.
GS—E. H. Evans, " "
PA—Earl McCoy, " "
EM—Crozer Land Assn..Elkhorn, W. Va.
MM—Samuel Evans.....Pageton, W.Va.
EE—U. J. Shaffer, " "
MS—J. A. Gallimore and N. T. Hanna, Pageton, W.Va.
SCO—Address the Company. Buyer, L. E. Smith, Pageton, W. Va.
S orf H—7 Elec. loco. and mules; track gauge 36 in.
S of M—3 Elec., 4 Comp. air mach.
PP—8 Atlas return tubular boilers, total 1200 H. P., 2 gen. units, 550 volts D. C., 2 comp., 4 pumps.
EMP—550. Coke ovens, 454 Bee Hive. Last fiscal year output 302,848 tons.
Sales Agency, Crozer-Poca Co., Bluefield, W. Va.

PAINT CREEK COLLIERIES CO.

General Office, Scranton, Pa.
W. L. Connell, Receiver, Scranton, Pa.
SCO—Mucklow Supply Co., Buyer, D. C. Flynn, Mucklow, W. Va.
Sales Agent, R. H. Richardson.

Paint Creek and Scranton Mines; Drifts; Coalburg Seam; 4 o 7 ft. thick.
PO—Mucklow, W .Va.; SP—Same; CTY—Kanawha; RR—C. & O., Paint Creek Br.
MS—C. E. Ellis.......Mucklow, W.Va.
S of H—11 Elec. loco.; track gauge 42 in.
S of M—14 Elec. mach.
PP—Boilers, 450 H. P.; gen. units 500 volts D. C.; 1 pump. Power purchased for Paint Creek Mine.
EMP—400.

Wacomah and Banner Mines; Drifts; Coalburg Seam; 5 to 6 ft. thick.
PO—Mucklow, W. Va.; SP—Wacomah, W. Va.; CTY—Kanawha; RR—C. & O., Paint Creek Br.
MS—C. E. Ellis........Mucklow, W.Va.
S of H—4 Elec. loco.; track gauge 42 in.
S of M—10 Elec. mach.
PP—Boilers, 750 H. P. gen. unit 500 volts D. C.; 3 pumps.
EMP—125 (at Wacomah Mine.)

Grose Mine; Drift; Powellton Seam; 5½ ft. thick.
PO—Tomsburg ,W. Va.; SP—Same; CTY—Kanawha; RR—C. & O.
S of H—3 Elec. loco.
S of M—5 Elec. mach.
PP—Boilers, total 300 H. P.; gen. units 250 volts D. C.
EMP—160.

Nuckolls, Greenbrier, Hickory Camp, Detroit and Morton Mines not being operated.

PANTHER COAL CO.

General Office, Welch, W. Va.
Panther Mine; Drift Pocahontas, Splint, and Red Ash Seams; 36 to 72 in. thick.
PO—Panther, W. Va.; SP—Same; CTY—McDowell; RR—N. & W., Main Line.
PR—Wm. Leckie.........Welch, W.Va.
GM—Wm. Leckie, " "
TR—A. E. Jennings, " "
CE—J. H. Williams, " "
GM—W. S. Leckie.....Panther, W. Va.
MS—W. S. Leckie, " "
PA—W. S. Leckie, " "
MM—W. R. Talbott, " "
EE—W. R. Talbott, " "
SCO—Panther Coal Co. Buyer, J. H. Pillis, Panther, W. Va.
S of H—6 elec. loco. Track gauge 36 in.
S of M—2 elec. mach.
PP—Wickes water tube boiler, 250 H. P., gen. units 250 volts D. C., 1 pump.
EMP—100.
Sales Agent, R. J. Tabor, Panther, W.Va.

PARAGON COAL CO.

Paragon Mine; Drift; Winifred or Thacker Seam, 66 to 84 in. thick.
PO—Yolyn, W.Va.; SP—Same; CTY—Logan; RR—C. & O., River Creek Branch.
PR—W. E. Deegans...Mt. Hope, W. Va.
TR—Naaman Jackson,
GM—W. E. Deegans, Mt. Hope, W.Va.
GS—E. C. James, ...Yolyn, W.Va.
PA—E. C. James, " "
MS—J. A. McCallister, " "
MM—J. W. Lusher, " "
EE—J. W. Lusher, " "
EM—W. C. McCall.....Logan, W. Va.
S of H—1 Elec. loco.; track gauge 44 in.
S of M—6 elec. mach.
PP—1 Return tubular boiler, 125 H.P., 2 gen. units 250 volts D.C., 1 pump.
EMP—200. Last fiscal year output 126,000 tons.
Sales agency, Winifrede Coal Co., Huntington, W. Va.

PARDEE & CURTIN LUMBER CO.

PO—Curtin, W. Va. Mine coal for their own use.
Panther Creek Mine, Slope, Seam 4 ft. thick.
PO—Curtin, W. Va. Coal is mined by contract by Jos. Boggs.
S of H.—Rope.
S of M—Hand.
PP—1 boiler.
EMP—4. Last fiscal year output 3,000 tons.
Camp No. 21 Mine, Slope Seam 4 ft. thick.
PO—Curtin, W. Va.. Coal is mined by contract by A. W. Smith.
S of M—Hand.
EMP—4. Last fiscal year output, 3,000 tons.

PARRS RUN COAL CO.

See Mineral State Coal Co.

PATTERSON, S. J.—POCAHONTAS COAL CO.

General Office, Dayton, O.
Arista Nos. 1 and 2 Mines; Drifts; Poca No. 3 Seam, 48 to 60 in. thick.
PO—Arista, W. Va.; SP—Springton, W. Va.; CTY—Mercer; RR—N. & W., Widemouth Br.
PR—S. J. Patterson........Dayton, O.
TR—H. J. Dreese, " "
GM—R. D. Patterson, " "
GS—J. T. Morris........Arista, W.Va.
PA—J. T. Morris, " "
CE—J. T. Morris, " "
EE—R. E. Cassell, " "
SCO—Address the Company. Buyer, R. W. Wells, Arista, W. Va.
S of H—3 elec. loco. Track gauge 56½ inches.
S of M—3 elec. mach.
PP—Gen. units 250 volts D. C.; 1 pump; power purchased.
EMP—130. Last fiscal year output 65,000 tons.
Sales Agency, S. J. Patterson Co., Dayton, O.

PAWAMA COAL & COKE CO.

General Office, No. 1 Broadway, New York, N.Y.
Pawama Nos. 1 and 2 Mines; Drift; Poca No. 3 Seam, 54 in. thick.
PO—Matoaka, W.Va.; SP—Same and Giatto, W.Va.; RR—N. & W., Widemouth Br.
PA—J. C. Stras, ...Matoaka, W.Va.
MS—J. C. Stras, " "
EE—J. Lee Bailey, " "
S of H—1 Elec. loco.; track gauge 48 in.
S of M—2 Elec. mach. and hand.
PP—Power purchased.
EMP—105.

PEERLESS COAL & COKE CO.

General Office, Pottsville, Pa.
Peerless Nos. 1 and 2 Mines; Drifts; Pocahontas No. 3 Seam; 68 to 78 in. thick.
PO—Vivian, W. Va.; SP—East Vivian, W. Va.; CTY—McDowell; RR—N. & W., Main Line.
PR—Geo. C. Clausem..New York, N. Y.
TR—E. C. Luther........Pottsville, Pa.
GM—E C. Luther, " "
GS—W. G. Williamson....Vivian, W.Va.
PA—W. G. Williamson, " "
MS—T. R. Barrett and Sam Mitchell, Vivian, W.Va.
EM—Wm. C. Morgan, " "
MM—P. J. McAlarms, " "
EE—T. A .Martin, " "
SCO—Address the Company, " "
S of H—6 Elec. loco. and mules; track gauge 44 in.
S of M—Hand.
PP—5 Brownell return tubular boilers, total 750 H. P., 1 gen. unit, 550 volts D. C., 2 pumps.
EMP—425. Coke ovens, 150 Bee Hive. Last fiscal year output 250,000 tons.
Sales Agency, Crozer Pocahontas Coal Co.

PEMBERTON COAL & COKE CO.

PR—W. A. Phillips....Mt. Carmel, Pa.
TR—M. K. Watkins, " "
GM—W. A. Phillips, " "
GS—G. A. Hinterleitner..Affinity, W. Va.
PA—G. A. Hinterleitner, " " "
ME—R. G. Wilfong, " "
MM—P. E. Mentz....Affinity, W.Va.
EE—Frank Adams, " " "
SM—M. E. Cornett, " "
Sales Agency, Castner, Curran & Buillitt, Phila., Pa.

Affinity Mine, Slope; Bekley Seam, 4 ft. thick.
PO—Affinity, W. Va. SP—Same. CTY—Raleigh. RR—Virginian.
MF—F. H. Campbell....Affinity, W. Va.
S of H—5 elec. loco. Track gauge 44 in.
S of M—4 elec. mach.
PP—4 Keeler Water tube boilers, total 600 H. P., 1 gen. unit, 250 volts, D. C. 2 pumps.
EMP—90. Last fiscal year output 88,700 tons.

Big Stick Mine, Drift; Beckley Seam, 5½ ft. thick.
PO—Affinity, W. Va.; SP—Woodbay, W. Va. CTY—Raleigh.
MF—L. A. Conner....Hot Coal, W. Va.
SM—H. E. Lushbaugh, " " "
S of H—2 elec. loco. and mules. Track gauge 44 in.
S of M—Hand.
PP—3 Water tube boilers, total 450 H. P. 2 pumps.
EMP—105. Last fiscal year output, 241,750 tons.

PEMBERTON FUEL CO.

General Office, Pemberton, W. Va.
Pemberton Mine; Drift; Beckley Seam, 48 in. thick.
PO—Pemberton, W. Va.; SP—Same; CTY—Raleigh; RR—Virginia Ry. and C. & O. Ry.; Piney River Br.
PR—Prince E. Lilly, Pemberton, W. Va.
GM—Prince E. Lilly " "
GS—Prince E. Lilly " "
PA—W. I. Smith, " "
MS—Frank Beard " "
CE—John R Hornbrook, " "
EM—John R. Hornbrook, " "
EE—K. E. Smith, " "
TR—T. H. Wickman ...Beckley, W. Va.
SCO—Pemberton Fuel Co. Store. Buyer, H. J. Reed, Pemberton, W. Va.
S of H—1 elec. loco.
S of M—2 elec machs.
PP—Purchase power. 220 volts A. C., 3 phase, 60 cycles.
EMP—100. Last fiscal year output, 78,400 tons.
Sales Agency, C. & O. Coal Agency.

PEN-MAR MINING CO.

Pen-Mar Mine, Drift, Kanawha No. 5 Seam, 4 ft. 8 in. thick.
PO—Big Chimney, W. Va. SP—Pen-Mar, W. Va. CTY—Kanawha. RR—Coal & Coke Ry.
PR—Jacob Householder, (owner). Big Chimney, W. Va.
GM—Jacob Householder, " " " "
MS—S. T. Hoge, " " " "
EM—Arthur E. Wood, " " " "
SCO—Jacob Householder, " " " "
S of H—Mules. Track gauge 42 in.
S of M—Hand.
EMP—16. Last fiscal year output 6,726.45 tons.

PEYTONA BLOCK COAL CO.

Peytona Mine; Drift; No. 2 Gas Seam; 3½ to 4 ft. thick.
PO—Peytona. W. Va.; SP—Same; CTY—Boone; RR—C. & O.
PR—W. H. Warner.......Cleveland, O.
TR—Whitney Warner, " "
GS—John H. Walker....Peytona, W.Va.
PA—John H. Walker, " "
EM—R. S. Walter...Charleston, W. Va.
EE—C. F. Schowen, " "
S of H—Mules and 1 storage battery loco. Track gauge 42 in.
S of M—4 elec. mach.
PP—2 Return Tubular Boilers, total 300 H. P., 1 gen. unit, 250 volts D. C.
EMP—65. Last fiscal year output 42,758 tons.
Sales Agency, W. H. Warner Co., Cleveland, O.

PHILLIPS COAL CO.

Phillips Mine, Drift, Pgh. Seam, 7 to 9 ft. thick.
PO—Fairmont, W. Va. SP—Bentens Ferry. CTY—Marion. RR—B. & O.
GM—James Phillips, Fairmont, W. Va.
S of H—Mules. Track gauge 42 in.
S of M—Hand.
EMP—25. Last fiscal year output, 20,000 tons.

PICKSHIN COAL CO.

Drift; Beckley or New River Seam; 60 to 84 in. thick.
PO—Tralee, W. Va.; CTY—Wyoming; SP—Stone Coal, W. Va.; RR—C. & O., Virginian.
PR—J. E. Toliver ....Beckley, W. Va.
TR—J. C. Sullivan ....Tralee, W. Va.
GM—J. C. Sullivan " "
PA—J. C. Sullivan " "
CE—Philip Konrad, Kanawha Falls, W. Va.
EM—Philip Konrad, Kanawha Falls, W. Va.

PINEY MINING CO.

General Office Beckley, W. Va.
Mines Nos. 1 2, 3, and 4; Drifts 1, 2 and 4 Beckley Seam, 3 Sewell Seam, 4 to 7 ft. thick.
PO—Stanaford, W. Va. SP—Same. CTY—Raleigh. RR—C. & O.
PR—W. D. Boyer, Scranton, Pa.
TR—S. C. Boyer......Beckley, W. Va.
MGR—F. W. Cool....Stanaford, W. Va.
PA—F. W. Cool, " "
CE—C. M. Binford, " "
EM—C. M. Binford, " "
MS—M. P. Campbell, " "
MS—Frank McClain......Riley, W.Va.
MS—Ben Guy, " "
SCO—Piney Mining Co. Buyer, C. F. Monroe, Sr., Stanaford, W. Va.
S of H—Mules, 5 elec. and 1 steam loco. Track gauge 44 inches.
S of M—Pick and 2 elec. machines.
PP—6 Return tubular boilers, total 900 H. P., 2 gen. units, 500 volts D. C. 4 pumps.
EMP—400. Last fiscal year output 325,000 tons.
Sales agency New River & Ohio Coal Co., Charleston, W. Va.

PITTSBURGH GAS COAL CO.

General Office, Cleveland, O.
Shaft Mine; Pitsburgh Seam; 96 to 120 in. thick.
CTY—Marion; RR—B. & O., Main line.
GS—G. B. Hartley, Morgantown, W. Va.
PA—G. B. Hartley, " "
CE—G. B. Hartley " "
EM—Monongahela Valley Eng. Co., Morgantown, W. Va.
S of H—Elec. loco. Track gauge 42 in.
S of M—Elec. machine.

PITTSVEIN COAL CO.

Pittsvein Mine; Drift; Pittsburgh Seam; 90 in. thick.
PO—Flemington, W. Va.; SP—Same; CTY—Taylor; RR—B. & O.
PR—L. T. Haggin, New York, N. Y.
TR—H. Esk Moller, " " "
GS—Geo. S. Brackett, Flemington, W. Va.
PA—Geo. S. Brackett, " "
EM—Geo. S. Brackett, " "
MS—Geo. S. Brackett, " "
MM—Peter Moyer, " "
EE—Peter Moyer, " "
SM—G. S. Goodwin, " "
S of H—3 Elec. loco.
S of M—5 Elec. mach.
PP—2 Erie Iron Works Boilers, total 250 H. P., gen. unit, 250 volts D. C.
EMP—125. Last fiscal year output 125,000 tons.
Sales Agency, New York Office.

PLYMOUTH COAL & MINING CO.

Plymouth Mine, Drift, Pittsburgh No. 8 Seam, 5½ ft. thick.
PO—Plymouth, W. Va. SP—Same. CTY Putnam. RR—K. & M.
PR—J. T. Thomas.
TR—J. T. Hatfield, .. Covington, Ky.
GM—M. C. Mitchell, Plymouth, W. Va.
GS—M. C. Mitchell, " " "
PA—W. S. Parsons, " " "
MM—John Hackett " " "
EE—W. E. Goodwin, " " "
SM—W. S. Parsons, " " "
S of H—3 Elec and 2 steam loco. Track gauge 30 inches.
S of M—Hand.
PP—2 boilers, 200 H. P. 500 volts D. C.

POCAHONTAS CONSOLIDATED COLLIERIES CO., INC.

General Office, Pocahontas, Va.
24 mines in Virginia and West Virginia.
PR—Isaac T. Mann, Bramwell, W. Va.
TR—L. B. Crawford, Pocahontas, Va.
GM—Jas. Ellwood Jones, Switchback, W. Va.
Asst.
GM—J. C. Turley, ...Pocahontas, Va.
PA—W. D. Garwood, " "
CE—A. H. Stowe, " "
EM—A. H. Stowe, " "
EE—W. A. Bishop, " "
SCO—J. W. Bailey, (Buyer) " "
Asst. Sec, J. W. Graybeal, " "
Gen. Counsel, Geo. W. Woodruff, 1 Bdwy., N. Y.
Sales agency, Pocahontas Fuel Co., 1 Bdwy., New York City.

Caswell Creek Mine, Drift, Pocahontas No. 3 Seam; 108 in. thick.
PO—Freeman, W. Va. SP—Simmons, W. Va. CTY—Mercer. RR—Norfolk & Western, Crane Creek Branch.
MS—R. S. Whitehead. .Switchback, W.Va.
SM—H. L. Craft, Freeman, W. Va.
S of H—Mules and elec. track gauge, 44 inches.
S of M—Elec. machines.
PP—Power purchased. 231 Bee Hive coke ovens.

Sagamore Mine; Drift; Pocahontas No. 3 Seam, 5½ ft. thick. Operate washery.
PO—McComas, W. Va SP—Mora, W. Va. CTY—Mercer. RR—Norfolk & Western, Crane Creek Branch.
MS—J. C. Baldwin, McComas, W. Va.
SM—C. W. Murphy, " "
S of H—Elec. Track gauge 44 inches.
S of M—Elec. machines.
PP—Power purchased. 280 Bee Hive coke ovens.

Norfolk-Angle Mine, Drift, Pocahontas No. 3 Seam, 7 ft. thick. Operate washery.
PO—Maybeury, W. Va. SP—Angle, W. Va. CTY—McDowell. RR—Norfolk & Western, Switchback Branch.
MS—R. S. Whitehead, Switchback, W. Va.
SM—E. L. Harris, Maybeury, W. Va.
S of H—Mules and elec. track gauge 44 in.
S of M—Electric machines.
PP—Buy power. 514 Bee Hive coke ovens.

Lick Branch, Shamokin and Delta Mines, Drifts, Pocahontas No. 3 Seam, 6 to 8 ft. thick.
PO—Switchback, W. Va. SP—Same. CTY—McDowell. RR—Norfolk & Western, Switchback Granch.
MS—R. S. Whitehead, Switchback, W. Va.
SM—E. W. Pearman, " " "
S of H—Mules and elec. Track gauge 44 in. and standard.
S of M—Electric machines.
PP—Power purchased. 667 Bee Hive coke ovens.

Rolfe Mine, Drift, Pocahontas No. 3 Seam, 56 in. thick.
PO—Worth, W. Va. SP—Northfork, W. Va. CTY—McDowell. RR—Norfolk & Western. Northfork Branch.
MS—C. H. Bowers, ...Worth, W. Va
SM—J. E. Noel, " "
S of H—Electric. Track gauge 44 in..
S of M—Electric machines.
PP—Power purchased. 100 Bee Hive coke ovens.

Cherokee Mine, Drift, Pocahontas No. 3 Seam 5 ft. thick. Operate washery.
PO—Ashland, W. Va. SP—Same. CTY McDowell. RR—Norfolk & Western, Northfork Branch.
MS—W. M. Pearman, Ashland, W. Va.
SM—H. F. Hancock, " " "
S of H—Mules and elec. Track gauge standard.
S of M—Electric machines.
PP—Power purchased. 121 Bee Hive coke ovens.

Pocahontas Nos. 6 and 7, Drifts, Pocahontas No. 3 Seam, 9 ft. thick.
PO—Jenkinjones W Va. SP—Same. CTY—McDowell. RR—Norfolk & Western, Tug River Branch.
MS—C. W. Atkinson, Jenkinjones, W. Va.
SM—J. P. Curtis, " " "
S of H—Electric. Track gauge 44 in.
S of M—Electric machines.
PP—Power purchased.

Pocahontas No. 8. Drift. Pocahontas No. 3 Seam, 9 ft. thick.
PO—Jenkinjones, W. Va. SP—Same. CTY—McDowell. RR—Norfolk & Western, Tug River Branch.
MS—C. W. Atkinson, Jenkinjones, W. Va.
SM—D. C. Spangler, " " "
S of H—Electric. Track gauge, 44 in.
S of M—Electric machines.
PP—Power purchased.

Cirrus Mine, Slope, Pocahontas No. 3 and No. 4 Seams, 5 ft. thick.
PO—Big Four, W. Va. SP—Same. CTY—McDowell. RR—Norfolk & Western, Main Line.
MS—R. S. Whitehead. .Switchback, W.Va.
SM—O. T. Strong, " "
S of H—Mules and elec. Track gauge 44 in.
S of M—Electric Machines.
PP—Generate own power.

POCAHONTAS DOMESTIC COAL CO.

General Office, 811 Leader Building, Cleveland, Ohio.
Scorpion Mine, Drift, War Creek Seam, 4 ft. thick.
PO—War, W. Va. SP—Same. CTY—McDowell. RR—N. & N., Dry Fork Branch.
PR—W. H. Warner, ... Cleveland, O.
TR—Whitney Warner, " "
PA—K. B. Whitworth, " "
EM—E. L. Thrower, " "
MS—J. D. Nash, War, W. Va.
S of H—1 gasoline motor and 1 elec.
S of M—1 Elec. mach.
PP—1 Erie City return tubular boiler, 100 H. P. 1 Gen. unit 250 volts D. C.
EMP—68. Last fiscal year output 83,395 tons. Sales agents, W. H. Warner & Co., Cleveland, O.
Note—Just opening No. 2 Mine at Susanna, W. Va.

POCAHONTAS SMOKELESS COAL CO.

See New Pocahontas Coal Co.

POOL-TOWNSHEND COAL CO.

General Office, Clarksburg, W. Va.
Gilbert Mine; Drift; Pittsburgh Gas Seam; 77 to 108 in. thick.
PO—Rosebud, W. Va.; SP—Same and Dola, W. Va.; CTY—Harrison; RR—B. & O. Short Line.
PR—Mason M. Townshend, New York, N.Y.
TR—Chas. E. Pool.......Cleveland, O.
GM—Chas. E. Pool, " "
GS—Chas. E. Pool, " "
PA—Chas. E. Pool, " "
MS—H. C. Connor...Rosebud, W. Va.
S of H—Mules and 1 gasoline loco.; track gauge 42 in.
S of M—Hand.
EMP—35. Last fiscal year output 47,000 tons.

POTOMAC VALLEY COAL CO.

General Office, Fairmont, W.Va.
PR—John Y. Hite, ..Fairmont, W.Va.
PA—John Y. Hite, " "
TR—Louis Rafetto, Philadelphia, Pa.
EM—H. G. Larew, Jr., Independence, W.Va.
Sales Agency, Hite & Rafetto, Philadelphia, Pa.

Peerless Mine; Drift, Up Freeport Seam, 66 in. thick.
PO—Blaine, W.Va.; SP—Peerless, W. Va.; CTY—Mineral; RR—W.Md.
MS—D. T. Purcell, ...Blaine, W.Va.
S of H—1 Gasoline loco. and mules; track gauge 42 in.
S of M—Hand.
EMP—59. Last fiscal year output 60,000 tons.

Louise Mine; Drift; L. Kittanning Seam, 66 in. thick.
PO—Chaffee, W.Va.; SP—Same; CTY—Mineral; RR—W.Md.
MS—R. H. Wilson, ..Chaffee, W.Va.
S of H—1 Gasoline loco. and mules; track gauge 42 in.
S of M—Hand.
EMP—59. Last fiscal year output 60,000 tons.

POWHATAN COAL & COKE CO.

Mine, Drift, No. 3 Pocahontas Seam, 5 to 7 ft. thick.
Po—Powhatan, W. Va., SP—Elkhorn, W. Va., CTY—McDowell. RR—N. & W. Express office, Powhattan, W. Va.
PR—J. J. Tierney....Powhatan, W.Va.
TR—L.E. Tierney, " "
GM—L. E. Tierney, " "
PA—G. C. Wood, " "
MS—W. T. Hetherman, " "
EM—E. B. Stone, " "
EE—E. B. Stone, " "
SCO—Powhatan Coal & Coke Co., Buyer, P. B. Sleet, " "
S of H—Mules and 4 elec. loco.
S of M—Hand and 4 elec. machines
PP—5 Fire tube boilers, total 750 H. P., 2 gen. units 550 volts D. C. 1 air comp. and 3 pumps.
EMP—500. 225 Bee Hive coke ovens. Last fiscal year output 380,000 tons.
Sales Agency, Crozer-Pocahontas Co.

PREMIER POCAHONTAS COLLIERIES CO.

Premier Poca Mines Nos. 1, 2, 3 and 4, Drifts, Welch and Pocahontas No. 5 Seams, 3 ft. 5 in. to 4½ ft. thick.
PO—Premier, W. Va., SP—Same, CTY—McDowell. RR—Norfolk & West. Spice Creek Branch.
PR—Frank P. Harman. .Lynchburg, Va.
TR—Morriss Watts....Eckman, W.Va.
GM—Frank P. Harman, Lynchburg, Va.
GS—J. C. Saunders....Premier, W.Va.
PA—J. C. Saunders, " "
CE—A. H. Bell, " "
EM—A. H. Bell, " "
MM—G. J. Bragg, " "
EE—R. P. Whittaker, " "
SCO—Premier Pocahontas Collieries Co., Buyer, Jos. L. Edwards, Premier, W.Va.
S of H—7 Elec. loco., track gauge 3 ft. 8 in.
S of M—Hand.
PP—4 Erie water tube boilers, 2 gen. units 550 volts D.C.
EMP—375. Last fiscal year otput 319,505 tons.
Sales Agents, Percy Heliner & Son, Philadelphia, Pa.

PRESTON COAL COMPANY

General Office, Independence, W. Va.
Preston No. 1 Mine; Shaft; Lower Kittanning Seam; 60 to 72 in. thic.
PO—Independence, W. Va.; SP—Same; CTY—Preston; RR—B. & O.
PR—C. H. Alderfer.....Norristown, Pa.
TR—S. L. Clark.....Philadelphia, Pa.
GS—H. R. Bissell...Independence, Pa.
PA—H. R. Bissell, " "
EM—H. R. Bissell, " "
S of H—1 elec. loco. Track gauge 42 in.
S of M—1 elec. mach.
PP—2 water tube boilers, total 450 H. P., 1 gen. unit, 250 volts D. C., 2 pumps.
EMP—60. Last fiscal year output 51,580 tons.

PRESTON COUNTY COKE CO.

Cascade Nos. 1, 2 and 3. Drifts, Up. Freeport Seam, 6 ft. thick. Wasery, Bradford Dry Cleaner
PO—Cascade, W. Va., SP—Same. CTY—Preston. RR—M. & K.
PR—H. C. Greer. .Morgantown, W.Va.
TR—Everhart Bierer....Cascade, W.Va.
GM—Everhart Bierer, " "
GS—Everhart Bierer, " "
PA—A. W. Hawley, " "
EE—Geo. Ramsey, " "
SCO—Preston Co. Sup. Co. Buyer, C. C. Clear, Cascade, W. Va.
EM—G. B. Hartley, Morgantown, W.Va.
S of H—5 Elec. loco., track gauge 44 in.
S of M—Hand and 2 elec. mach.
PP—4 Atlas water tube, and 2 Erie return tubular boilers, total 700 H. P., 3 gen. units 250 volts D. C.
EMP—145. 194 Bee Hive coke ovens Last fiscal year output 84,394 tons.

PRINCEWICK COAL COMPANY

General Office, Beckley, W. Va.
Drift Mine; Beckley & Pocahontas Seams; 48 to 64 in. thick.
PO—Lillybrook, W. Va.; CTY—Raleigh, RR—Virginian, Winding Gulf Br.
PR—W. W. Hume......Beckley, W. Va.
VP—Prince E. Lilly, . .Pemberton, W. Va.
TR—T. H. Wickam.....Beckley, W. Va.
Sec—T. H. Wickam " "
GM—John R. Harnbrook Pemberton, W. Va.
GS—John R. Harnbrook, Pemberton, W. Va.
S of H—Elec. loco.
Note—Developing mine. Expect to ship coal by Oct. 1, 1916.

PROCKTER COAL COMPANY

General Office, Amherstdale, W. Va.
Procter Mine; Drift; Island Creek Seam, 62 to 67 in. thick.
PO—Amherstdale, W. Va.; SP—Same; CTY—Logan; RR—C. & O.; Guyan Branch.
PR—A. J. Dalton,......Omar, W. Va.
TR—J. A. Kelly " "
GM—Walter Prockter, Amherstdale, W.Va.
PA—Walter Prockter " "
CE—B. D. Williams, Amherstdale, W. Va.
EM—B. D. Williams, " "
EE—I. I. Ward, " "
MS—Geo. Vance, " "
S of H—3 elec. locos. and 2 combination storage batteries. Track gauge 48 in.
S of M—2 elec. mach.
PP—Buy power.
EMP—70.
Note—Commenced shipping coal 1-7-16.

PULASKI IRON CO.

General Office, Real Estate Trust Bldg., Philadelphia, Pa.
Pulaski Mine; Drift; Pocahontas No. 3 Seam; 6 to 8½ ft. thick.
PO—Eckman, W. Va.; SP—Same; CTY—McDowell; RR—N. & W.
PR—Horace L. Haldeman, Philadelphia, Pa.
TR—Edward P. Borden, " "
GM—Percival Johnson......Pulaski, Va.
MS—Floyd .E. Cunnyngham, Eckman, W.Va.
EM—Chas. S. Stevenson, " "
EE—H. P. Chandler, " "
S of H—3 Elec. loco.; track gauge 44 in.
S of M—3 Elec. mach.
PP—5 Return Tubular Boilers, total 700 H. P.; 3 gen. units 250 volts D. C.
EMP—500. Coke ovens, 260 Bee Hive. Last fiscal year output, 380,371 tons.

QUAKER SPLINT COAL CORP.

General Office, 231 Arcade, Cleveland, O.
Katherine & Brackett Mines; Drifts; Pittsburgh No. 8 Seam; 72 to 120 in. thick.
PO—Bower, W. Va.; SP—Same; CTY—Braxton; RR—Coal & Coke.
PR—Robert Bursner......Cleveland, O.
GM—Robert Bursner, " "
PA—Robert Bursner, " "
TR—A. J. Salzer..... Bower, W. Va.
GS—A. J. Salzer, " "
MM—A. J. Salzer, " "
MS—H. H. Pierce, " "
CE—J. G. Alstetter. .Clarksburg, W. Va.
EM—J. G. Alstetter. .Clarksburg, W. Va.
SM—R. A. Darnall.....Gilmer, W. Va.
SCO—S. A. Bruno & Co., Bower, W. Va.
S of H—1 elec. loco. Track gauge—Katherine Mine, 36 in. Brackett Mine, 42 in.
S of M—2 elec. mach.
PP—Receive power from Copen Creek Coal Co.
Sales Agent, Robert Burnsner, Cleveland, O.
These mines were formerly operated by Gilmer Consolidated Coal Co.

QUEEN SHOALS COAL CO.

Out of business.

QUINCY COAL CO.

Mines Nos. 1 and 2, Drift; "Lewiston" and No. 5 Seam; 3 ft. to 5 ft. thick.
PO—Quincy, W. Va., SP—Dickinson, W. Va., CTY—Kanawha. RR—K. & M.
PR—J. Q. Dickinson. .Charleston, W.Va.
TR—J. L. Dickinson, " "
GM—J. L. Dickinson, " "
PA—H. H. Fletcher....Quincy, W.Va.
MS—H. H. Fletcher, " "
SM—H. R. Young, " "
S of H—Mules and 4 Elec. loco.; track gauge 42 in.
S of M—8 Electric machines.
PP—2 Erie return tubular boilers total 300 H. P., 2 gen. units, 250 volts D. C.
EMP—100. Last fiscal year output 75,000 tons

QUINNIMONT COAL CO.

General Office, Quinnimont, W. Va.
Big Q. and Lick Branch Mines, Drifts, Fire Creek Seam.
PO—Lawton, W. Va., SP—Big Q., W. Va., CTY—Fayette. RR—C & O.
GM—John C.Gallaudet, Quinnimont, W.Va
EM—S. H. Bridge, Quinnimont, W.Va.
SM—C S. Moss......Lawton, W.Va.
EE—J. W. Merritte " "
MF—Ed. Gordon, " "
S of H—Elec. loco.
S of M—Elec and hand mining.
PP—250 volts D. C., and 2000 volts A. C. 3 boilers.
EMP—275

RALEIGH COAL & COKE CO.

PR—John M. Wright.....Cincinnati, O.
TR—H. V. Stephenson....Raleigh, W.Va.
PA—H. V. Stephenson, " "
GM—Ernest Chilson " "
EM—John R. Hornbrook, " "
GS—Jas. P. White, " "
EM—Wade H. Horn, " "
MM—P. M. Anderson, " "
EE—R. B. Holmes, " "
SCO—Address the Company. Buyer, W. W. Reif, Raleigh, W. Va.
Sales Agency, (Eastern) C. & O. Coal Co., Boston, Mass.; (Western) Raleigh Coal & Coke Co., First National Bank Bldg., Cincinnati, O.

Nos. 1, 2 and 4 Mines; Drift; Beckley Seam; 65 to 165 in. thick.
PO—Raleigh, W. Va.; SP—Same; CTY—Raleigh; RR—C. & O., Piney Br., Virginian.
S of H—4 Elec. loco.; track gauge 44 in.
S of M—2 Elec. mach. and hand.
PP—Power purchased; 5 pumps.
EMP—70. Last fiscal year output 90,000 tons.

Nos. 3 and 6 Mines; Drift; Beckley Seam, 66 to 168 in. thick.
PO—Raleigh, W. Va.; SP—Same; CTY—Raleigh; RR—C. & O., Piney Br., Virginian.
S of H—15 Elec. loco.; rack gauge 44 in.
S of M—10 Elec. mach.
PP—Power purchased; 16 pumps.
EMP—295. Last fiscal year output 455,000 tons.

No. 5 Mine; Drift, Beckley Seam, 48 to 60 in. thick.

(Continued on Next Page.)

Raleigh Coal & Coke Co.—Cont.
PO—Raleigh, W. Va.; **SP**—Mabscott, W. Va.; **CTY**—Raleigh; **RR**—C. & O., Piney Br., Virginian.
S of H—Mules.
S of M—Hand.
PP—Power purchased; 2 pumps.
EMP—25. Last fiscal year output 21,000 tons.

RED. JACKET. CONSOLIDATED. COAL & COKE CO., Inc.

General Office, Red Jacket, W. Va.
PR—Isaac T Mann..Branwell, W.Va.
TR—C. A. Fischer..Red Jacket, W.Va.
GS—Wm. N. Cummins, " "
PA—E. K. Buckner, " "
EM—A. F. Marshall, " "
MM—E. L. Spriegel, " "
SCO—Red Jacket Store, Grapevine Store and Mitchell Branch Store.

Mitchell Branch and Red Jacket Mines. Drifts; Lower Kittanning Seam; 48 to 66 in. thick.
PO—Red Jacket, W. Va., **SP**—Same, (prepay) **CTY**—Mingo. **RR**—Norfolk & Western, Mate Creek Br.
MS—W. A Wilson, Red Jacket, W. Va.
S of H—Mules and 14 elec. loco., track gauge 48 in.
S of M—14 Elec. machines.
PP—2 Wickes water tube boilers, total 800 H P., 1 gen. unit 250 volts D. C.

Grapevine Mine; Drift; Lower Kittanning Seam; 72 in. thick.
PO—Edgarton, W. Va., **SP**—Delorme, W Va., **CTY**—Mingo. **RR**—Norfolk & Western, Main Line.
MS—W. A Wilson..Red Jacket, W.Va.
S of H—Mules, track gauge 48 inches.
S of M—Elec. mach.

No. 32 Mine; Lower Kittanning Seam, 48 to 66 in. thick.
PO—Red Jacket, W. Va.; **SP**—Same (Prepay); **CTY**—Mingo; **RR**—N. & W.
MS—W. A. Wilson, Red Jacket, W. Va.
S of H—4 locomotives. Track gauge 48 in.
S of M—4 elec. mach.
PP—2 Wickes water tube boilers, total 800 H. P., 1 gen. unit, 250 volts D. C.

RED JACKET, JR., COAL CO.

Red Jacket Nos. 1 and 2 Mines; Drift; L. Kitanning Seam; 42 in. to 60 in. thick.
PO—Red Jacket, W. Va.; **SP**—Same; **CTY**—Mingo; **RR**—N. & W.
PR—W. M. Ritter........Columbus, O.
TR—C. A. Fischer....Red Jacket, W.Va.
GS—Wm. M. Cummins, " "
PA—E. K. Buckner, " "
MS—W. A. Wilson, " "
EM—A. F. Marshall, " "
MM—E. L. Spriegel, " "
SM—J. D. McDonough, " "
S of H—Elec. loco.
PP—Houston Stanwood & Gamble Boiler.
Sales Agency, Norfolk & Chesapeake Coal Co., Detroit, Mich.

RED ROCK FUEL COMPANY

General Office, Fairmont, W. Va.
Receiver, Geo. De Bolt, Fairmont, W. Va.
Red Rock Mine; Drift; 48 to 60 in. thick.
PO—Red Rock, W. Va.; **SP**—Same; **CTY**—Upshur; **RR**—B. & O.
PR—A. S. List......Wheeling, W. Va.
TR—R. C. Dalzell, " "
SUPT—H. S. Reppert, " "
MS—H. S. Reppert, " "
CE—Engineering Dept., Consolidation Coal Co., Fairmont, W. Va.
EE—John Reppert...Red Rock, W. Va.
SCO—Red Rock Fuel Co. Buyer, Oscar Jones, Red Rock, W. Va.
S of H—4 elec. locos. Track gauge 42 in.
S of M—8 elec. machs.
PP—1 horizontal tubular boiler, total 150 H. P., 1 Buckeye engine, 1 150 K. W. Westinghouse generator, 250 volts D. C., 2 pumps.
EMP—75. Last fiscal year output 60,000 tons.

REPUBLIC COAL CO.

Nos. 1, 2, 3. 4 and 5 Mines; Drifts; Nos. 1 and 2 Gas and Carbon Seams, 42 to 78 in. thick.
PO—Carbon, W. Va.; **SP**—Republic, W. Va.; **CTY**—Kanawha; **RR**—C. & O.
PR—C. A. Cabell........Carbon, W.Va.
TR—C. A. Cabell, " "
GM—C. A. Cabell, " "
MS—E. B. Pearse, " "
CE—K. M. Quickel, " "
EE—J. J. Foster, " "
Auditor—E. C. Hanna, " "
SM—L. F. McGhee, " "
S of H—8 elec. loco. and mules. Track gauge 42 in.
S of M—9 elec. mach.
PP—Power purchased; 1 pump.
EMP—175. Last fiscal year output 176,000 tons.
Sales Agency, Carbon Fuel Co., Traction Bldg., Cincinnati, O.

RICH CREEK COAL COMPANY

General Office, Fairmont, W. Va.
Wilburn Mine; Drift; Cambell's Creek No. 2 Gas Seam; 58 to 66 in. thick.
PO—Manbar, W. Va.; **SP**—Wilber (Prepay); **CTY**—Logan; **RR**—C. & O., G. V. branch.
PR—Brooks S. Hutchinson, Fairmont, W. Va.
TR—J. F. Cole, " "
GM—F. E. Hutchinson, Manbar, W. Va.
PA—E. M. Jeffrey......Logan, W. Va.
SM—E. M. Jeffrey, " "
CE—B. L. Flynn, " "
SCO—Wilburn Store, Manbar, W. Va.
S of H—2 elec. locos. Track gauge 44 in.
S of M—2 elec. mach.
PP—Purchase power.
EMP—30. Last fiscal year output 50,000 tons.

RICHLAND BLOCK COAL CO.

General Office, Wheeling, W. Va
Beech Bottom Mine, Drift, 5 ft. 4 in. thick.
PO—Short Creek, W. Va. **SP**—Same. **CTY**—Brooke **RR**—P. C. C. & St. L.
PR—J. C. McKinley...Wheeling, W.Va.
TR—J C. McKinley " "
GM—J. C. McKinley, " "
MS—J. P. Leonard..Short Creek, W.Va.
S of H—7 elec. loco. Track gauge 42 in.
S of M—7 elec. mach.
PP—500 volts D. C., (Power purchased)

RICHLAND COAL CO.

Richland Mine, Drift, 5½ ft. thick.
PO—Wheeling, W. Va., **SP**—Same, **CTY**—Ohio. **RR**—P. C. C & St. L.
PR—J. C. McKinley...Wheeling, W.Va.
TR—J C. McKinley " "
GM—J. C. McKinley, " "
GS—L. W. Brown, "
EM—P C. Christy, " "
S of H—9 elec. loco. Track gauge 36 in.
S of M—13 elec. machines.
PP—500 volts D. C. (Central power sta.)

RIDGEVIEW COAL CO.

Out of business.

RIGHTER COAL & COKE CO.

Righter Mine, Drift, Redstone & Pittsburgh Seams, 4½ to 6½ ft. thick.
PO—Lost Creek, W. Va. **SP**—Same. **CTY** Harrison. **RR**—B. & O.
PR—A. C. Leisenring, Lost Creek, W.Va.
TR—J. L. Robinson, " "
GM—A. C. Leisenring, " "
PA—A. C. Leisenring, " "
GS—H. C. Ash, " "
EE—W. G. Sutton, " "
CE—D. D. Britt, Clarksburg, W.Va.
FM—D. D. Britt, " "
SCO—Righter Store, Buyer, L. L. Moore, Lost Creek, W. Va.
S of H—Mules, 2 gasoline motors and 1 storage battery loco. Track gauge 42 in.
S of M—Hand.
PP—2 pumps, 250 volts D. C.
EMP—100. Last fiscal year output 114,694 tons.

RIGHT FORK COAL CO.

General Office, Ivaton, W. Va.
Right Fork Mine; Drift; No. 5 Block Seam; 60 in. thick.
PO—Ivaton, W. Va.; **SP**—Ivy Branch (Prepay): **CTY**—Lincoln; **RR**—C. & O., Little Coal River Branch.
PR—W. R. Fenimore....Ivaton, W. Va.
GM—W. R. Fenimore " "
TR—A. H. Fenimore " "
PA—A. H. Fenimore " "
EM—Ewing & Nelson...Clothier, W. Va.
MS—F. C. Fenimore....Ivaton, W. Va.
S of H—Mules. Track guage 42 in.
S of M—2 elec. meah.
PP—1 pump, purchase power.
Output 4160 tons, 3 months developing.
Sales Mgr. Fred Legg. Sales Agency—Logan & Kanawha Coal Co., Cincinnati, O.

RIVER VALLEY COLLIERY CO.

Bachman Mine, Drift, Sewell Seam, 3½ ft. thick.
PO—Hawks Nest, W. Va., **SP**—Bachman, W. Va., **CTY**—Fayette **RR**—C. & O.
PR—D W. Boone......Lookout, W.Va.
TR—W. F. Boone..Ronceverte, W.Va.
GM—D. W. Boone......Lookout W.Va.
EM—Clark & Krebs, Charleston, W.Va.
PA—M. L. Wickline...Backman, W. Va.
MS—W. R. Cattle, " "
SM—M. L. Wickline, " "
S of H—Mules and 1 Elec. loco.; track gauge 42 in.
S of M—4 elec. mach.
PP—1 boiler, 500 volts D. C.
EMP—75. Last fiscal year output 26,000 tons.
Sales Agency, C. & O. Coal Agency Co. Boston, Mass.

RIVESVILLE COAL COMPANY

Drift Mine; Sewickley Seam; 72 in. thick.
PO—Rivesville, W. Va.; **SP**—So. Rivesville, W. Va.; **CTY**—Marion; **RR**—B. & O., Paw Paw Branch.
PR—R. A. Pollock,...Rivesville, W. Va.
GM—R. A. Pollock, " "
GS—P. D. Pollock, " "
MS—P. D. Pollock, " "
S of H—Mules.
S of M—1 elec. mach.
PP—Purchase power.

ROANOKE COAL & COKE CO.

Roanoke Mine, Drift, Pocahontas No. 3 Seam, 4½ to 5 ft. thick.
PO—Worth, W. Va., **SP**—Crumpler, W. Va., **CTY**—McDowell **RR**—N. & W., North Fork Branch.
PR—Isaac T. Mann..Bramwell, W.Va.
TR—C. A. Fischer..Red Jacket, W.Va.
GS—Hanry Brooke......Worth, W.Va.
PA—Henry Brooke, " "
EM—Henry Brooke, " "
MM—J. N. Preston, " "
EE—J. N. Preston, " "
SM—R. L. Mastin, " "
S of H—Mules and 3 elec. loco., track gauge 44 in.
S of M—Hand and 1 elec. mach.
PP—3 Water tube boilers, 250 K. W., 2 gen. units 250 volts D. C.
Sales Agency, Pocahontas Fuel Co., Bluefield, W. Va.

ROBINSON COAL CO.

James Mine, Pittsburgh Seam; 5 ft. thick.
PO—Fairmont, W. Va.,; **SP**—Same; **CTY**—Marion. **RR**—B. & O.
PR—H. P Robinson, Fairmont, W.Va.
GM—H. P. Robinson, " "
PA—H. P. Robinson, " "
MS—P. Horker, " "
S of H—Mules, track gauge 36 in.
S of M—Hand.
Last fiscal year output 20,000 tons.

ROBINSON COAL COMPANY.

Davis Mine; Drift; Pittsburgh Seam; 84 to 108 in. thick.
PO—Flemington, W. Va; **SP**—Same; **CTY**—Taylor; **RR**—B. & O.
OWNER—C. D. Robinson, Flemington, W. Va.
PA—C. D. Robinson, " "
GS—Dorsey Pople, " "
MS—W. M. Drainer, " "
S of H—Rope.
S of M—Hand.
EMP—50. Last fiscal year output 50,000 tons.
Note—Formerly operated by Estate of T. B. Davis.

ROBINSON, JOHN L.

Kunst Mine; Drift; Pittsburgh Seam; 81 in. thick.
PO—Grafton, W. Va.; **SP**—Same; **CTY**—Taylor; **RR**—B. & O.
PR—John L. Robinson...Grafton, W. Va.
TR—John L. Robinson, " "
GM—John L. Robinson, " "
GS—John L. Robinson, " "
S of H—Mules. Track gauge 32 in.
S of M—Hand.
EMP—3. Last fiscal year output, 2000 tons.

ROCK LICK COAL CO.

General Office, Staunton, Va.
Nos. 1 and 2 Mines, Drift, Sewall and Fire Creek Seam, 3 ft. to 4½ ft. thick.
PO—Concho, W. Va. **SP**—Same. **CTY** Fayette. **RR**—C. & O., South Side Branch.
PR—H. B. Sproul......Staunton, Va.
GM—H. B. Sproul, " "
TR—A. Erskine Miller, " "
PA—Gilbert Smith .....Concho, W.Va.
EM—Gilbert Smith, " "
MS—Gilbert Smith, " "
MM—H. E. Koehm, " "
SM—E. A. Murdock, " "
S of H—4 Elec. loco. and mules; track gauge 44 in.
S of M—2 elec. mach. and hand.
PP—Purchase power.
EMP—190. Last fiscal year output 114,691 tons.

ROCKY BRANCH POCAHONTAS COAL CO.

General Office, Lex, W. Va.
Rocky Branch Mine; Drift; Welch or Davy Sewell Seam; 30 to 54 in. thick.
PO—Lex, W. Va.; **SP**—Same; **CTY**—McDowell; **RR**—N. & W.; Dry Fork Branch.
PR—G. B. Hopkins .....Lex, W. Va.
GM—G. B. Hopkins " "
GS—G. B. Hopkins " "
TR—H. J. Brooke .....Welch, W. Va.
PA—H. J. Brook " "
CE—H. J. Brook " "
EM—H. J. Brook " "
S of H—Mules. Track gauge 44 in.
S of M—Hand.
PP—1 gasoline pump, 1 gasoline engine driven fan.
EMP—12 to 15. Daily output, 75 to 100 tons.

ROSEBUD FUEL CO.

General Office, Fairmont, W. Va.
Rosebud No. 1 and No. 2, Drifts, Pittsburg Seam 7 to 9 ft. thick.
PO—Rosebud, W. Va., **SP**—Same, **CTY**—Harrison **RR**—B. & O.
PR—W. E. Watson, Jr., Fairmont, W.Va.
TR—J. F. Straight, " "
GM—W. E. Watson, Jr. " "
EM—West Virginia Eng. Co., " "
MS—Geo. Gaskill,.....Rosebud, W. Va.
SCO—Rosebud Fuel Co. Store
SM—M. C. Tennant. " "
S of H—1 elec. loco. Track gauge 42 in.
S of M—2 Elec. mach. and 7 comp. air mach.
PP—2 Erie return tubular boilers, total 250 H. P., 1 gen. unit 250 volts D. C, 1 air comp. and 4 pumps.
EMP—130

ROSEMONT COAL CO.

General Office. Land Title Bldg., Philadelphia, Pa.
Rosemont Mine; Drift; Pgh. Seam, 72 to 114 in. thick.
PO—Rosemont, W. Va.; **SP**—Flemington, W. Va.; **CTY**—Taylor; **RR**—B. & O., Main Line.
PR—J. H. Weaver.....Philadelphia, Pa.
TR—J. E. Wilkinon, " "
PA—J. E. Wilkinon, " "
GS—C. E. Sharpless.....Ebensburg, Pa.
EM—F. C. McDaniel, " "
MS—Jas. A. Haislip...Rosemont, W.Va.
MM—Thos. Hamrick " "
EE—Thos. Hamrick, " "
SCO—Rosemont Store Co. Buyer, M. A. Lynch, Rosemont, W. Va.
S of H—3 Elec. loco.; track gauge 42 in.
S of M—4 Elec. mach.
PP—2 Meadville water tube boilers, total 300 H. P.; 2 gen. units, 275 volts D. C., 5 pumps.
EMP—275.
Sales Agency, J. H. Weaver & Co., Philadelphia, Pa.

ROTHWELL COAL Co.

Dubree and Rosedale Mines; Drifts; Sewell Seam, 44 in. thick.
PO—Dubree, W. Va.; **SP**—Rothwell; **CTY**—Fayette **RR**—C. & O. Keennny's Creek Br.
PR—H. H. Rothwell.......Dubree, W.Va
GM—H. H. Rothwell, " "
PA—H. H. Rothwell, " "
GS—H. H. Rothwell, " "
MS—Chas. M. Higgins, " "
SM—Bert Hall, " "
TR—Harrison B. Smith, Charleston, W. Va.
S of H—1 Elec. loco. and mules track gauge 42 in.
S of M—2 Elec. mach. and hand.
PP—1 Atlas return tubular boiler, 150 H. P.; 1 gen. unit 250 volts D. C.; 1 pump.
EMP—85.
Sales Agency, New River Coal Co.

ROYAL COAL CO.

Royal Mine; Drift; Fire Creek Seam; 30 to 54 in. thick.
PO—Royal, W. Va.; **SP**—Same; **CTY**—Raleigh **RR**—C. & O., Piney Br.
PR—Wm. Prince.........Prince, W.Va.
TR—E. E. Huddleston.....Royal, W.Va.
GM—E. E. Huddleston, " "
PA—E. E. Huddleston, " "
MS—E. E. Huddleston, " "
EE—E. E Thomas, " "
EM—S. H. Bridge,...Quinnimont, W.Va.
S of H—1 Elec. loco. and mules; track gauge 44 in.
S of M—Hand.
PP—2 Return Tubular boilers, totlal 275 H. P.; 1 gen. unit 250 volts D. C.
EMP—85. Last fiscal year output 35,152 tons.
Sales Agency, C. & O. C. & C. Co., Sun, W. Va.

ROYAL BLOCK COAL COMPANY

General Office, Morrisvale, W. Va.
Drift Mine; No. 5 Seam; 58 in. thick.
PO—Morrisvale, W. Va.; **SP**—Same; **CTY**—Boone; **RR**—C. & O., Coal River branch.
PR—S. E. Bradley.....Madison, W. Va.
TR—S. E. Bradley, " "
GM—J. B. Ramage,...Morrisvale, W. Va.
GS—J. B. Ramage, " "
MS—W. H. Stuart, " "
CE—S. E. Bradley.....Madison, W. Va.
S of H—1 elec. and 1 storage battery loco. Track gauge 42 in.
S of M—3 elec. mach.
Daily output, 2 carloads.

RUFFNER COAL COMPANY

Ruffner Mine; Drift; Eagle Seam; 51 to 72 in. thick.
PO—Accoville, W. Va.; **SP**—Same; **CTY**—Logan; **RR**—C. & O., Buffalo Creek branch.
PR—Shirley Ruffner,...Accovvile, W. Va.
GM—Shirley Ruffner, " "
TR—C. L. Donevant, " "
PA—C. L. Donevant, " "
MS—C. L. Donevant, " "
CE—A. C. Dawson, " "
EM—A. C. Dawson, " "
SCO—Ruffner Coal Co. Buyer, L. R.

Coulling, Accoville, W. Va.
S of H—1 elec. loco. Track gauge 44 in.
S of M—1 elec. mach.
PP—1 pump. Purchase power.
EMP 25. Last fiscal year output 16,236 tons.

SABINE SMOKELESS COAL CO.

PR -J. C. Sullivan,.....Tralee, W. Va
TR C. H. Mead.........Otsego, W.Va.
GM -C. H. Mead, " "
PA C. H. Mead, " "
GS W. B. Parks, " "
SCO -Address the Company. Buyer, R. V. Leftwitch, Otsego, W. Va

No. 3 Poca Mine; Drift, No. 3 Poca Seam; 48 in. thick.
PO—Otsego, W. Va.; SP Same; CTY—Wyoming; RR -Virginian, Main Line.
MS R. A. Snead.......Otsego, W. Va.
S of H 1 elec. loco. Track gauge 44 in.
S of M -Hand and 2 elec. mach.
PP—Power purchased.

Sabine Mine; Drift; Fire Creek Seam; 48 to 60 in. thick.
PO—Otsego, W. Va. SP—Same; CTY—Wyoming; RR—Virginian.
MS -Wm. Cooke........Otsego, W. Va.
S of M 1 elec. loco. Track gauge 44 in.
PP—Buy power.

ST. CLAIR COLLIERY CO.

St. Clair and Archer Mines; Seam, 54 to 78 in. thick.
PO—Eagle, W. Va.; SP—Same; CTY—Fayette; RR—C. & O.
TR—Wm. Burlington, ...Cincinnati, O.
GS -John Connell, ...Eagle, W.Va.
S of H—1 Elec. loco.
S of M—Elec. mach.
PP—Power purchased. 1 gen. unit 250 volts D.C.
EMP—150.
Sales Agency, Burlingham Coal Co., Cincinnati, O.

SANDRIDGE, LEE J., COAL CO.

Meriden Mines Nos. 1, 2, 3, 4 and 5, Drifts, Upper Freeport Seam, 6 ft. thick.
PO—Meriden, W. Va., SP—Same, CTY—Barbour. RR—B. & O., G. & B. Branch.
PR—Lee J. Sandridge..Meriden, W.Va.
TR—H. E. Thompson, " "
GM—Lee J. Sandridge, " "
GS—Lee J. Sandridge, " "
PA—Lee J. Sandridge, " "
CE—Thos. Dailey...Wilsonburg, W.Va.
MM—John Teets......Philippi, W. Va.
SCO—Meriden Merc. Co., Buyer, A. Miller, " "
S of H—Mules and 3 elec. loco., track gauge 3 ft.
S of M— 6 Elec. machines.
PP—4 Erie return tubular boilers, 2 gen. units 250 volts D. C., - pump.
EMP—60. 50 Bee Hive coke avons., Last fiscal year output, 50,800 tons.
Sales Agent, A. Thompson, 915 Betz Bldg., Philadelphia, Pa.

SAXMAN COAL & COKE CO.

General Office, 1414 Commonwealth Bldg., Philadelphia, Pa.
Saxman Nos. 1, 2 and 3, Slopes, Sewell Seam, 3½ to 5 ft. thick.
PO -Saxman, W. Va.; SP—Fenwick, W. Va., CTY—Nicholas. RR—B. & O., Saxman Branch.
PR—E. F. Saxman........Phila., Pa.
TR S. T. Gano........Boston, Mass.
GM C. R. Saxman..Saxman, W.Va.
PA—G. R. Saxman, " "
GS I. R. Thomas, " "
EM I. R. Thomas, " "
EE -Chas. Perkins, " "
SCO—Saxman Store Co. Buyer, I. R. Clark, " "
S of H—2 Elec. loco., track gauge 44 in.
S of M—3 Elec. mach. and hand.
PP—3 return tubular boilers, total 450 H. P., 2 gen. units, 1, 150 K. W. and 1, 100 K. W., 250 volts D. C.
EMP 170. 50 Bee Hive coke ovens. Last fiscal year output 85,000 tons.
Sales Agents, Philadelphia office.

SCOTIA COAL & COKE CO.

Rush Run, W. Va.
PR—G. H. Caperton, Charleston, W.Va.
TR—W. N. Jasper....Rush Run, WVa.
GM—G. H. Caperton, Jr., " "
GS—H. A. Mosely, .. Finlow, W. Va.
EM O. D. Amick, ...Rush Run, W. Va.
MM—Henry Jackson..Rush Run, W.Va.
SCO—Scotia Coal & Coke Co. Buyer, W. N. Jasper, Rush Run "

Sales Agency, New River Coal Co., Charleston, W. Va.

Rush Run and Red Ash Mines, Drifts, Fire Creek Seam, 3 to 7 ft. thick.
PO—Rush Run, W. Va., SP—Same, CTY Fayette. RR—C. & O., South Side Branch.
MS—G. H. Caperton, Jr., Rush Run, W. Va.
S of H—Mules and 8 elec. loco. Track gauge 44 inches.
S of M Hand.
PP -2 gen. units, 500 volts D. C., 2300 A. C., 3 phase, 60 cycles, 6 pumps. Buy power. 94 Bee Hive coke ovens. (Not in use).
EMP—140. Last fiscal year output 84,000 tons.

Brookyn Mine, Drift, Sewell Seam, 4 ft. thick.
PO—Finlow, W. Va. SP—Brooklyn, W. Va., CTY—Yayette RR—C & O., South Side Branch.
MS—.H A. Mosely....Finlow, W.Va.
S of H -Mules and 5 elec. loco. Track gauge 44 in.
S of M—Hand and 4 elec. mach.
PP—1 gen. unit, 500 volts D. C., 2300 volts A. C., 3 phase, 60 cycles, 3 pumps. Purchase power. 63 Coke ovens, Bee Hive type. (not in use).
EMP 64. Last fiscal year output 59,000 tons.

SECONE COAL CO.

PR A. J. King, ..Charleston. W.Va.
GM- A. J. King, " "
PA -A. J. King, " "
TR—C. M. Galway, " "
MS F. E. King........Logan, W. Va.
Have not yet commenced operations.

SE KAY COAL CO.

General Office, Huntington, W. Va.
See Kay Mine; 74 to 82 in. thick.
PO—Crown, W. Va.; SP -Kistler, W. Va.; CTY—Logan; RR—C. & O., Guyandotte branch.
PR -F. Enslow, Jr., Huntington, W. Va
TR G. D. Miller, " "
GM—W. C. Sharpe, ...Crown, W. Va.
GS—W. C. Sharpe, " "
PA W. C. Sharpe, " "
S of H 1 elec. loco.
S of M—1 elec. mach.
PP -Purchase power.

SENG CREEK COAL CO.

Blue Star Mine, Drift, Coalburg Seam, 5½ ft. thick.
PO—Whitesville, W. Va. SP—Coal Valley, W. Va. CTY—Boone. RR—C. & O.
PR—T. E. B. Siler..Charleston, W.Va.
VP—Matthew Slush.....Detroit, Mich.
TR—H. M. Slush..Whitesville, W.Va.
PA—H. M. Slush, " "
MS S. W. Smith, " "
EE—W. A. Gleason, " "
SM—Frank Facinoli, " "
EM—J. B. Eaton.....Charleston, W. Va.
S of H 5 elec. loco.
S of M—5 elec. mach.
PP Buy power. 1 gen. unit, 250 volts D. C.
EMP -146. Last fiscal year output 110,000 tons.
Sales Mgr. J. L. Siler, Charleston, W. Va.

SEWELL COLLIERY CO.

General Office, Caperton, W. Va.
Sugar Camp Mine, Drift, Sewell Seam, 4 ft. thick.
PO—Caperton, W. Va., SP—Same, CTY—Fayette. RR—C. & O.
PR—D. W. Boone.....Lookout, W. Va.
GM D. W. Boone " "
GS D. W. Boone " "
MS—D. W. Boone, " "
TR J. D. Boone......Fayette, W. Va.
PA—M. H. Wood.....Caperton, W. Va.
SM—W. R. Herndon, " "
CE—Clark & Krebs, Charleston, W.Va.
EM—Clark & Krebs, " "
SCO Address the Company. Buyer, M. H. Wood, Caperton, W. Va.
S of H—Mules and 2 elec. loco. Track gauge 44 in.
S of M Hand and 2 elec. mach.
PP—1 Atlas water tube boiler, 150 H. P., 1 gen. unit, 500 volts D. C.,
EMP—90. Last fiscal year output 45,397 tons.

SEWELL POCAHONTAS COAL CO.

General Office, Roderfield, W. Va.
Vaughan Mine; Drift; Sewell Seam; 42 to 54 in. thick.
PO—Roderfield, W. Va.; SP—Same; CTY McDowell; RR—N. & W.
PR—J. L. Vaughan.....Shawsville, Va.
TR -S. C Snead, " "
GM—R. W. Liddle....Roderfield, W. Va.
GS R. W. Liddle, " "
PA R. W. Liddle, " "
MS W. P. Liddle, " "
MM Noah Smith, " "
SM J. E. Proctor, " "
EM—C. C. Bailey, " "
SCO -Vaughan Supply Co. Buyer, John E. Proctor, Roderfield, W. Va.
S of H—Mules and 2 elec. locos. Track gauge 48 in.
S of M Hand.
PP Purchase power.
EMP 80. Last fiscal year output 60,000 tons.
Successors to Vaughan Construction Co.

SHAMROCK COAL CO.

PR A. Z. Litz..........Tazewell, Va.
TR R. R. Smith....Huntington, W. Va.
GM—R. R. Smith, " "
GS—J. B. Agee.........Logan, W. Va.
PA—J. B. Agee, " "
MS—J. B. Agee, " "
EM Beddow, McCorkle & Wilson.
SCO- Shamrock Store. Buyer, J. G. McGuire, Logan, W. Va.

Litz-Smith No. 1 Mine; Drift; No. 2 Gas Seam; 72 to 78 in. thick.
PO—Logan, W. Va.; SP Shamrock; CTY—Logan; RR C. & O.
S of H Mules and 1 elec. loco. Track gauge 48 in.
S of M- 2 elec. mach.
PP 500 volts D. C. Purchase power.
EMP—40. Last fiscal year output 48,000 tons.

Litz-Smith No. 2 Mine; Drift; No. 2 Gas Seam, 72 to 78 in. thick.
PO Logan, W. Va.; SP—Shamrock; CTY—Logan; RR C. & O.
S of H Mules and 1 elec. loco. Track gauge 48 in.
S of M 3 elec. mach.
PP Purchase power.
EMP—70. Last fiscal year output 68,000 tons.

SHAWNEE COAL & COKE CO.

Shawnee Mine, Drift, Poca No. 3 Seam.
PO—Eckman, W. Va. SP—Same. CTY—McDowell. RR—N. & W.
GM—Morris Watts.....Eckman, W.Va.
PA—Morris Watts, " "
SM B. H. Aker, " "
S of H—Elec. and mules.
S of M—Hand.
PP—3 boilers, total 400 H.P.,250 volts D. C.
EMP—225. Coke ovens—188.

SIGNAL KNOB COAL CO.

Signal Knob Mine; Drift; No. 2 Gas Seam, 60 in. thick.
PO -Ansted, W. Va; SP—Same; CTY—Fayette; RR—C. & O., Hawks Nest Br.
PR—W. H. Evans,.....Ansted, W.Va.
TR- W. H. Evans, " "
GM—W. H. Evans, " "
PA W. H. Evans, " "
MS -R. H. Massey, " "
EM R. H. Massey, " "
EE R. H. Massey, " "
S of H—Mules.
S of M- Hand.
EMP—50. Last fiscal year output 25,000 tons.
Sales Agency, Eastern Coal & Export Corp., Richmond, Va.

SILUSH COAL CO.

Drift Mine; Kanawha Seam; 63 to 132 in. thick.
PO—Silush, W. Va.; SP—Morrisvale, W. Va.; CTY Boone; RR C. & O., Horse Creek Br.
PR—T. E. B. Siler, Charleston, W. Va.
TR—A. O. Siler........Silush, W. Va.
PA—A. O. Siler, " "
GM—G. W. Spradling " "
MM—John Keffer " "
EE -John Keffer " "
SCO Silush Coal Co Store. Buyer, A O Siler, Silush, W Va.
S of H—2 elec. loco. Track gauge 44 in.
S of M—2 elec. mach.
PP—1 return tubular bboiler, 150 H P., 1 gen. unit, 250 volts D. C.
Output 125 tons a day.

SLAB FORK COAL COMPANY.

Slab Fork Mine, 5 openings, Drift, Beckley Seam, 3 ft. 8 in. to 6 ft. thick.
PO—Slab Fork, W. Va. SP—Same. CTY—Raleigh. RR—Virginia Ry.
PR—G. H. Caperton..Charleston, W.Va.
TR—W. G. Caperton, Slab Fork, W. Va.
GM—W. G. Caperton, " " " "
PA—W. G. Caperton, " " " "
CS—W. M. Warwick, " " " "
EM -G. C. Scarborough, " " " "
EE—H. H. Mayse.
SM—J. H. Reid, " " " "
S of H—Mules, and 12 elec. loco. Track gauge 44 inches.
S of M—Pick and 9 elec. machines.
PP -Purchase power.
EMP—350. Last fiscal year output, 297,115 tons. Sales Agency, New River Coal Co., Charleston, W. Va.

SMITH-POCAHONTAS COAL COMPANY

Drift Mine; Pocahontas & Fire Creek Seams; 54 to 66 in. thick.
PO—Otsego, W. Va.; SP -Same; CTY—Wyoming; RR—Virginian.
PR -J. E. Toliver.....Beckley, W. Va.
TR—C. H. Meador " "
GM W. E. Griffiths " "
EM—Hal M. Scott " "
S of H -Elec. loco.
PP Purchase power.

SMOKELESS COAL & COKE CO.

Smokeless Mine, Drift, Pocahontas No. 3 Seam; 54 to 60 in. thick.
PO—Hiawatha, W. Va. SP—Smokeless, W. Va. CTY—Mercer. RR—N. & W., Widemouth Branch.
PR—D. H. Barger, Shawsville, Va.
TR—Geo. S. Strader, Bluefield, W. Va.
GM—D. H. Barger, Shawsville, Va.
GS—O. N. Moomaw, Elliston, W. Va.
PA—P. L. Vest......Hiawatha, W.Va.
MS—P. L. Vest, Hiawatha, W. Va.
CE W. A. Cooper, ...Matoaka, W. Va.
EM W. A. Cooper, " "
SM -D. S. Hunt......Hiawatha, W. Va.
S of H—1 Elec. loco. Track gauge 56 in.
S of M—3 Elec. mach.
PP Purchase power.
EMP 100. Last fiscal year output, 45,750 tons.
Sales Agency, Bluefield Coal & Coke Co., Bluefield, W. Va.

SOLVAY COLLIERIES CO.

General Office, Syracuse, N.Y.
PR—F. R. Hazard, ..Syracuse, N.Y.
VP—W. L. Keen, " "
CE -W. L. Keen, " "
TR E. L. Lancaster, " "
PA J. A. Whaling, " "
GM—A. B. Rawn, Kingston, W.Va.
Sales Agency, W. H. Bell, Syracuse, N.Y.

Marytown Mine; Drift; Sewell Seam, 43 in. thick.
PO—Marytown, W.Va.; SP—Same (Prepay); CTY—McDowell; RR—N. & W., Main Line.
MS—C. W. Connor, Marytown, W.Va.
SM—C. E. Loudermilk, " "
S of H—2 Elec. loco. and mules; track gauge 48 in.
S of M—Hand.
PP—3 Return tubular boilers, total 375 H.P., 2 gen. units 250 volts D.C.
EMP—180.

Big Sandy Mine; Drift; Sewell Seam, 45 in. thick.
PO—Big Sandy, W.Va.; SP—Same, (Prepay); CTY—McDowell; RR—N. & W., Main Line.
MS C. W. Connor, Marytown, W.Va.
SM—C. E. Loudermilk, " "
S of H—2 Elec. loco.; track gauge 48 in.
S of M—5 Elec. mach. and hand.
PP—2 Return tubular boilers, total 250 H.P., 2 gen. units 250 volts D.C.
EMP—110.

Springton Mine; Drift; No. 3 Poca. Seam, 40 to 48 in. thick.
PO Springton, W.Va.; SP Same (Prepay); CTY—Mercer; RR—N. & W., Widemouth Branch
MS -C. A. Warden...Springton, W. Va.
SM—W. V. Tate, " "
S of H 5 elec. loco. and mules. Track gauge 56½ in.
S of M- 5 elec. mach. and hand.
PP—Power purchased.
EMP—110.

Kingston Mine; Drift; Powellton No. 2 Gas and Eagle Seam, 60 to 84 in. thick.
PO—Kingston, W.Va.; SP—Same, (Prepay); CTY—Fayette; RR—C. & O., Paint Creek Branch.
MS—H. S. McKallip, Kingston, W.Va.
SM W. C. Petty, " "
S of H—9 Elec., 2 steam loco. and mules; track gauge 48 in.
S of M -14 Elec. mach. and hand.
PP—2 B. & W. water tube boilers, total 600 H.P., gen. units 440 volts A.C., 26 cycles, 250 volts D.C.
PP—Power supplied from Central plant.
EMP—310.

Westerly Mine; Drift; Powellton No. 2 Gas and Eagle Seams, 60 to 84 in. thick.
PO—Kingston, W.Va.; SP—Westerly, W.Va., (Prepay); CTY—Fayette; RR—C. & O., Paint Creek Br.
MS—(Acting) H. S. McKallip, Kingston, W.Va.
SM—W. C. Petty, " ".
S of H—3 Elec. loco. and mules; track gauge 44 in.
S of M—4 Elec. mach. and hand.
PP—2 Return tubular boilers, gen. unit 250 volts D.C.
EMP—125.

SOUTH SIDE CO.

General Office, Caperton, W. Va
South Side Mine; Drift; Sewell Seam, 44 to 50 in. thick.
PO Caperton, W. Va.; SP—Same and S. Caperton, W. Va; CTY—Fayette; RR—C. & O., South Side Br.
PR—G. H. Caperton...Charleston, W.Va.
TR—G. H. Caperton, " "
GM H. A. Mosley....Finlow, W. Va.
GS H. A. Mosely, " "
PA—H. A. Mosely.......Finlow, W.Va.
MS H. A. Mosely, " "
CE W. G. Caperton..Slab Fork, W. Va.
EM O. D. Amick...Rush Run, W. Va.
MM—G. P. Thornton....Finlow, W. Va.
EE G. P. Thornton, " "
SCO- Address the Company. Buyer, B. K. Heese, Caperton, W. Va.
S of H—Mules and 2 elec. loco. Track gauge 40 in.
S of M—3 Elec. mach. and hand.
PP—1 pump. Purchase power.

(Continued on Next Page.)

South Side Co.—Cont.
EMP—125. Last fiscal year output 81,000 tons.
Sales Agency, New River Coal Co., Charleston. W. Va.

SOUTHERN CONNELLSVILLE COKE CO.
General Office, Uniontown, Pa. Two mines, one in Penna, and one in W. Va.
Marion Mine, Drift, Pittsburgh Seam, 6 to 7 ft. thick.
PO—Cheat Haven, Pa. SP—Same CTY—Fayette. RR—B. & O.
PR—F. E. Marhell, ..Uniontown, Pa.
TR—J. R. Davidson, " "
GM—S. A. Carson, " "
GS—S. A. Carson, " "
PA—S. A. Carson, " "
MS—A. Laing, Cheat Haven, "
SCO—Cheat Haven Supply Co., Buyer, T. M. Bawmor, Cheat Haven, Pa.
S of H—Mules. Track gauge 44 in.
S of M—Hand.
PP—2 boilers each 30 H. P.
EMP—94. Last fiscal year output, 75 000 tons. 64 Bee Hive coke ovens. Sales agent, S. A. Carson.

SOUTHWESTERN SPLINT FUEL CO.
General Office, Grafton, W. Va.
Black Cat Mine; Drift; Coalburg Seam; 54 to 60 in. thick.
PO—Crown Hill, W. Va.; SP—Same; CTY—Kanawha; RR—C. & O.
GM—John J. Hechmer....Grafton, W.Va.
MS—Ed. Saulsby, " "
S of H—1 Elec. loco.; track gauge 40 in.
S of M—4 Elec. mach.
PP—Power purchased.
EMP—60. Last fiscal year ouput, 42,600 tons.

SOVEREIGN COAL COMPANY
Sovereign Mine; Drift; Nos. 1 & 2; No. 2 Gas Seam; 72 to 96 in. thick.
PO—Sovereign, W. Va.; SP—Same, "Prepay"; CTY—Logan; RR—C. & O., Coal River branch.
PR—F. T. Lee.........Lynchburg, Va.
TR—H. P. Adams, " "
GS—J. J. Bumpus,...Sovereign, W. Va.
PA—J. J. Bumpus, " "
EE—W. D. Petry, " "
SM—F. W. Blair, " "
EM—Ewing & Nelson...Clothier, W. Va.
SCO—Sovereign Coal Co.
S of H—2 elec. storage batteries. Track gauge 44 in.
S of M—3 elec. mach.
PP—1 pump.
EMP—55. Last fiscal year output, 63,275 tons.

SPRUCE BEND COAL CO.
Sharples No. 1 and 2, Drifts, No. 2 Gas or Winifrede Seam, 4½ to 5 ft. thick.
PO—Sharples, W. Va. SP—Same. CTY—Logan. RR—C. & O., Coal River Branch.
PR—P. M. Sharples, West Chester, Pa.
TR—Isabel Darlington, " " "
GM—Samuel Butler, Sharples, W. Va.
GS—Samuel Butler, " " "
PA—G. D. Dillon, " "
MS—John Spearn, " "
CE—Philip Konrad, Kanawha Falls, W. Va.
EM—Philip Konrad, " " " "
MM—M. Selkirk,..... Sharples, W. Va.
EE—Samuel Butler, " " "
SCO—Spruce Bend Coal Co. Buyer, G. D. Dillon, Sharples, W. Va.
S of H—Mules and 3 elec. loco. Track gauge 42 inches.
S of M—5 Elec. machines.
PP—Power purchased.
EMP—130. Last fiscal year output, 73,885 tons.

SPRUCE RIVER COAL CO., THE
General Office, Massillon, O.
Ramage Mine No. 2; Drift; Eagle Seam No. 1 Gas; 60 in. thick.
PO—Ramage, W. Va.; SP—Same; CTY—Boone; RR—C. & O., Coal River Div.
PR—I. M. Taggart........Massillon, O.
TR—F. F. Taggart, " "
GM—F. F. Taggart, " "
MS—Fred Myers.......Ramage, W. Va.
PA—Fred Myers, " "
MM—T. E. Gibson, " "
EE—T. E. Gibson, " "
EM—S. E. Bradley......Madison, W.Va.
SCO—Spruce River Coal Co., Ramage, W.Va.
S of H—2 elec. and 2 storage battery locos. and mules. Track gauge 36 in.
S of M—6 Elec. mach.
PP—3 Water Tube Boilers; gen. unit 250 volts D. C.; 1 pump.
EMP—180. Capacity 1000 tons per day.
Sales Agent, F. F. Taggart, Massillon, O.

SPRUCE VALLEY COAL CO.
Spruce Valley Mine; Drift; Chilton Seam; 72 in. thick.
PO—Blair, W. Va.; SP—Same; CTY—Logan; RR—C. & O.
PR—A. C. Carr......Middlesboro, Ky.
TR—P. T. Colgan......Blair, W. Va.
GM—P. T. Colgan, " "
PA—P. T. Colgan, " "
MS—John Wills, " "
EM—Alfred Thomas, " "
SM—L. M. Patterson, " "
S of H—2 elec. and 3 storage battery loco. Track gauge 44 in.
S of M—3 Elec. mach.
PP—Purchase power. 250 volts D. C.
EMP—150. Last fiscal year output 157,306 tons.
Sales Agent, P. T. Colgan, Blair, W. Va.

SQUARE DEAL COAL CO.
Upland Bottom Siding Mine; Seam 36 in. thick.
PO—Lex, W.Va.; SP—Same; CTY—McDowell; RR—N. & W., Dry Fork Branch.
GM—H. W. Evans,.......Lex, W.Va.
GS—H. W. Evans, " "
MS—E. L. Dole, " "
SM—E. M. Evans, " "
EM—Vest & Cooper, ...Welch, W.Va.
S of H—Mules.
Sales Agent, E. M. Evans, Lex, W.Va

STAFFORD COAL COMPANY
General Office, Md. Trust Bldg., Baltimore, Md.
Stafford Mine; Shaft; Pittsburgh Seam, 84 to 108 in. thick.
PO—Baxter, W. Va.; SP—Baxter; CTY—Marion; RR—B. & O., Paw Paw br.
PR—C. L. Shaver,
PR—C. L. Shaver....Fairmont, W. Va.
TR—T. Frank Sheehan, Md. Trust Bldg., Baltimore, Md.
GM—Harry B. Clark..Fairmont, W. Va.
GS—Edwin Williams....Baxter, W. Va.
PA—Edwin Williams, " "
MS—James Dulin, " "
EM—R. Bates Wooters, " "
MM—Gilbert F. Mahaffey, " "
SCO—Stafford Coal Co. Store. Buyer, W. W. Powell, Baxter, W. Va.
S of H—4 comp. air locos. Track gauge 42 in.
S of M—18 comp. air mach.
PP—2 Wickes water tube boilers, 5 Erie return tubular boilers, total 1300 H. P., 1 gen. unit, 110 volts A. C., 1 pump, 1 high and 2 low air comp.
EMP—175. Daily output 2,000 tons.
Note—Successors to New Central Coal Co., of West Virginia.

STANDARD KANAWHA COAL MINING CO.
General Office, 808 People's National Bank Bldg., Scranton, Pa.
PR—Ronald P. Gleason....Scranton, Pa.
TR—Arthur A. Weinschenk, " "
GM—A. L. Black.....Charleston, W.Va.
GS—A. L. Black, " "
PA—D. W. Vineyard......Quick, W. Va.
MM—A. W. Black, " "
EE—C. H. Wickman, " "
MS—W. E. Davis, " "
CE—W. G. Crichton, Charleston, W. Va.
EM—W. G. Crichton " "
SM—D. W. Vineyard....Quick, W. Va.
SCO—Coalridge Store. Buyer, J. G. Tarton, Quick, W. Va.
Sales Agency, Oakland Coal Co., Toledo.

Coalridge Mine; Drift; No. 5 Splint Seam 56 to 62 in. thick.
PO—Quick, W. Va.; SP—Coalridge, W. Va.; CTY—Kanawha; RR—K. & W. V.
MS—A. L. Black......Quick, W. Va.
S of H—1 elec. loco. and mules. Track gauge 42 in.
S of M—9 Elec. mach.
PP—2 Erie Water Tube Boilers, total 300 H. P., 2 gen. units, 250 volts D. C.
EMP—150. Last fiscal year output 100,000 tons.

Acme No. 2, Drift, No. 5 Splint Seam, 6 ft. thick.
PO—Sanderson, W. Va. SP—Same. CTY—Kanawha; RR—K.&W.Va.
SM—J. M. Haid, Sanderson, W. Va.
S of H—Mules and 1 elec. loco. Track gauge 42 inches.
S of M—3 Elec. machines.
PP—Power furnished from No. 1 Mine.
EMP—60. Last fiscal year output, 15,000 tons. Idle part of last year.

STANDARD POCAHONTAS COAL CO.
General Office, Cleveland, O.
Standard Mine; Shaft, Poca. No. 3 Seam.
PO—Capels, W. Va.; SP—Same; CTY—McDowell; RR—N. & W.
PR—E. C. Maurer........Cleveland, O.
TR—C. E. Sullivan, " "
GM—H. T. Graham.....Welch, W. Va.
GS—John Gates........Capels, W.Va.
MS—Jas Somers.......Capels, W. Va.
SCO—Standard Supply Co., Buyer G. G. Douglas, Capels, W. Va.
S of H—Elec. loco.
S of M—Elec. mach.
PP—5 Boilers, toal 1,750 H. P.
EMP—200.
Sales Agency, Glen's Run Coal Co., Cleveland, O.

STANDARD SPLINT & GAS COAL CO.
Standard Mine, Drift; "Coalburg" Seam 60 to 108 in. thick.
PO—Standard, W. Va. SP—Same. CTY—Kanawha. RR—C. & O.
PR—J. R. Seal......Charleston, W.Va.
TR—W. S. Wood, " " "
GM—W. S. Wood, " " "
PA—W. S. Wood, " " "
MS—Ed. Foster......Standard, W. Va.
SM—P. T. Gatehouse, " "
EM—Morris Hansford.....Pratt, W.Va.
EE—Robt. Farrell....Standard, W. Va.
S of H—2 Elec. Loco. Track gauge 42 in.
S of M—5 Elec. Machines.
PP—2 water tube boilers, total 300 H. P., 1 generating unit, 250 volts D. C.
EMP—135. Last fiscal year output 89,000 tons.

STAR COAL & COKE CO.
Star Mine, Drift, Sewell Seam, 4 to 6 ft. thick.
PO—Redstar, W. Va., SP—Same, CTY—Fayette. RR—C. & O., Loup Creek Branch.
PR—Geo. W. Jones....Redstar, W.Va.
TR—Geo. W. Jones, " "
GM—Geo. W. Jones, " "
PA—Geo. W. Jones, " "
GS—Geo. W. Jones, " "
MS—D. Evendolle, " "
EM—Clark & Krebs, Charleston, W.Va.
EE—C. E. Watkins...Red Star, W. Va.
SM—H. W. Wood......Redstar, W.Va.
S of H—Rope, mules and 4 electric loco. Track gauge 44 in.
S of M—3 Jeffrey machines.
PP—5 Houston, Stanwood & Gamble boilers, total 750 H. P., 2 gen. units 500 volts D. C.,, 1 pump.
EMP—152. Last fiscal year output, 122,000 tons.
Sales Agency, New River Coal Co., Charleston, W. Va.

STERNBERGER, E. L., COAL CO.
General Office, Cincinntai, Ohio.
Sterngerger Mine, Drift, Winifrede White Ash Block Seam, 5 to 7 ft. thick.
PO—Goodman, W. Va., SP—Goodman and Chatteroy, W. Va., CTY—Mingo. RR—Norfolk & Western.
PR—E. L. Sternberger...Cincinnati, O.
TR—Thos. McEvilley......Norwood, O.
GM—O. B. Gould....Goodman, W.Va.
PA—O. B. Gould, " "
GS—J. E. Hufford, " "
MM—Alfred Boggs, " "
SM—L. T. Long, " "
EM—D. M. Good....Williamson, WVa.
CE—D. M Good, " "
S of H—Mules and 1 gasoline motor.
S of M—11 Compressed air mach.
PP—2 Water tube boilers, 2 Air comp. and 5 pumps.
EMP—85. Last fiscal year output 76,897 tons. Sales agent, J. T. Herbert, Sec., Cincinnati, O.

STERLING COAL CO., LTD.
Two mines in Ohio and one in W. Va.
General Office, Cleveland, Ohio.
Cecil Mine, Drift, Freeport Seam.
PO—Cecil, W. Va. SP—Same. CTY—Taylor. RR—B. & O.
PR—Chas. B. McNaught, Toronto, Ont.
TR—H. G. Ratcliffe......Toronto, Ont.
GM—H. D. Hileman.....Cleveland, O.
PA—F. M. Kirk, " "
EE—E. B. McNichols...Salineville, O.
S of H—2 elec. loco. Track gauge 42 in.
S of M—2 elec. mach.
PP—1 water tube boiler, total 150 H. P., 1 gen. unit, 250 volts D.C.

STONE BRANCH COAL CO.
Stone Branch Mine; Drift; No. 2 Gas Seam 48 in. thick.
PO—Stone Branch; SP—Same; CTY—Logan RR—C. & O., Guyan Valley Br.
PR—M. N. Moorman....Lynchburg, Va.
TR—J. P. Moorman, Stonebranch, W. Va.
GM—C. W. Jones........Cora, W. Va.
PA—C. W. Jones, " "
EM—J. B. McCorkle....Logan, W.Va.
S of H—4 Elec. loco. Track gauge, 44 in.
S of M—7 Elec. mach.
PP—2 return tubular boilers, 300 H. P., 2 gen. units, 250 volts D. C., 1 pump.
EMP—125. Last fiscal year output 125,000 tons.

STONE CLIFF COAL & COKE CO.
Stone Cliff Mine, Drift, Fire Creek Seam, 3 to 4 ft. thick.
PO—Stone Cliff, W. Va., SP—Same, CTY—Fayette. RR—C. & O.
PR—Thos. C. Beury..Charleston, W. Va.
TR—C. A. Brockman, "
GM—C. A. Brockman, " "
GS—C. A. Brockman, " "
PA—C. A. Brockman, " "
SM—R. E. Brockman, Stone Cliff, W. Va.
EM—S. H. Bridge..Quinnimont, W.Va.
MS—J. H. Dempsey, Stone Cliff, W. Va.
S of H—Mules and 3 elec. loco., track gauge 44 in.
S. of M—Hand.
PP—2 water tube boilers, total 250 H. P., 1 gen. unit, 500 volts D. C.
EMP—60. 60 Bee Hive coke ovens. Last fiscal year output 44,312 tons.
Sales Agency, West Virginia Coal Co., Richmond, Va.

STONE COAL LAND CO.
Drift Mine; Beckley and Pocahontas seam, 3 ft. 10 in. to 6 ft. thick.
PO—Besoco, W. Va.; CTY—Raleigh; RR—C. & O.
PR—E. C. Miller.......Besoco, W. Va.
GM—E. C. Miller, " "
GS—E. C. Miller, " "
PA—E. C. Miller, " "
TR—J. E. Toliver......Beckley, W. Va.
EM—A. K. Minter, Winding Gulf, W. Va.

STONE MOUNTAIN COAL CORP.
General Office, Roanoke, Va.
Marvin Mine; Drift; Edgar Grove Seam, 40 to 54 in. thick.
PO—Matewan, W. Va.; SP—Same, CTY—Mingo; RR—N. & W.
PR—H. C. Elliott.......Roanoke, Va.
TR—H. C. Elliott, " "
GM—H. C. Elliott, " "
GS—D. A. McDevitt, Matewan, W. Va.
PA—D. A. McDevitt, " "
MS—D. A. McDevitt, " "
MM—Troy Brown.....Matewan, W. Va.
CE—D. M. Good, Williamson, W. Va.
SCO—Stone Mountain Commissary, Buyer, T. F. Wilson, Matewan, W. Va.
S of H—1 elec. loco. Track gauge 36 in.
S of M—1 elec. mach.
PP—Power purchased.
EMP—50. Last fiscal year output 36,000 tons.
Sales Agency, Southern Sales Agency, Roanoke, Va.

STONEWALL COAL & COKE CO.
General Office, Wright, W. Va.
Stonewall Mine; Drift; Red Ash Seam; 42 to 72 in. thick.
PO—Terry, W. Va.; SP—Terry Junction; CTY—Raleigh; RR—C. & O.
PR—F. M. Lee........Alpoca, W. Va.
TR—Frank Stevens......Lynchburg, Va.
GM—C. B. Stewart.....Wright, W. Va.
GS—C. B. Stewart, " "
PA—Pedro Benner, " "
EM—Mr. Merrell.......Wright, W. Va.
MS—John Dickson.......Terry, W. Va.
MM—John Taylor, " "
EE—W. E. Morton, " "
SCO—Stonewall Coal & Coke Co. Buyer, D. B. Durretle, Terry, W. Va.
S of H—Elec. locos.
PP—3 pumps, 2 water tube boilers, total 500 H. P.
EMP—60.

STRATHMORE COAL COMPANY
General Office, 1308 Munsey Bldg., Baltimore, Md.
Strathmore Mine; Drift; Freeport Seam; 66 in. thick.
PO—Gormania, W. Va.; SP—Gorman, Md.; CTY—Grant; RR—Western Maryland, western div.
PR—Gordon Smith......Baltimore, Md.
SEC—John M. Galloway, " "
PA—Gordon Smith, " "
S of H—Mules.
S of M—Hand.

SUGAR CREEK COAL AND COKE CO.
General Office, Mt. Hope, W. Va.
Sugar Creek Mine, Drift, Sewell Seam, 6 ft. thick.
PO—Mount Hope W. Va., SP—Macdonald, W. Va.; CTY—Fayette; RR—C. & O., and Virginian Ry.
PR—Enoch Smith....Charleston, W.Va.
TR—Enoch Smith, " "
GM—Enoch Smith, " " "
GS—Enoch Smith, " " "
PA—R. E. Bailey.....Mt. Hope, W. Va.
MS—Allen Hoffer " "
MM—Guy Rodgers " "
EE—Guy Rodgers " "
SCO—Sugar Creek Store, Buyer, L. E. Fitzwater Mount Hope, W. Va.
S of H—Rope, track gauge 40 in.
S of M—Hand.
PP—3 Return tubular boilers, total 350 H. P., 2 gen. units 2200 volts A. C., 1 cycle 60 phases and 500 volts D. C., 13 pumps. Purchase power.
EMP—115. Last fiscal year output 70,555 tons.
Sales Agency, The C. G. Blake Co., Cincinnati, O., and Northern Coal Co., Boston, Mass.

SULLIVAN COAL & COKE CO.
Sullivan Mine; Drift; Beckley Seam.
PO—Sullivan, W. Va.; SP—Same (Prepay station); CTY—Raleigh; RR—C. &. O. and Virginian.
PR—W. S. Wood....Charleston, W. Va.
TR—G. G. Wood......Sullivan, W. Va.
GM—G. G. Wood, " "
PA—G. G. Wood, " "
MS—Lawrence Wiley, " "
CE—F. G. Wood, " "
EM—J. D. Duval, " "
MM—Charles Walker, " "
EE—Edward McVey, " "
SM—J. W. Malcolm, " "
S of H—7 elec. locos.

PP—3 water tube boilers, total 450 H. P., 2 gen. units, 250 and 275 volts D. C.
EMP—155.

SUNBEAM COAL CO.
General Office, Logan, W. Va.
Sunbeam Mine, Drift, Winifrede Seam, 4½ to 5 ft. thick.
PO—Fort Branch, W. Va., SP—Same, CTY—Logan. RR—C. & O.
PR—A. J. King......Charleston, W.Va.
TR—C. M. Golway Pocahontas, W.Va.
PA—A. J. King....Charleston, W.Va.
EM—E. R. Rieck........Logan, W. Va.
MS—F. E. King........Logan, W.Va.
SM—I. B. Early, " "
S of H—2 Elec loco., track gauge 44 in.
S of M—2 Elec. machines.
PP—1 Return tubular 200 H. P. boiler, 1 gen. unit 250 volts D. C., 1 pump.
EMP—35. Last fiscal year output 40,000 tons.

SUNDAY CREEK CO.
General Office, Columbus, O.
Seven mines in West Virginia and 20 in Ohio.
PR—J. S. Jones..........Columbus, O.
TR—H. J. Reese, " "
GM—John Winder, " "
PA—F. E. Falk, " "
Chief Eng—G. H. Dukes, " "
EE—O. S. Newton, " "
SM—G. E. Tetirick, " "
Sales Mgr., P. A. Coen, Columbus, O.

Nos. 111, 112 Mines, Drifts, No. 2 Gas Seam, 4½ to 5½ ft. thick.
PO—Carbondale, W. Va. SP—Same. CTY—Fayette. RR—K. & M.
MS—W. F. Mandt....Longacre, W.Va.
S of H—Elec. loco. and mules.
S of M—Elec.
PP—7 Boilers, total 900 H. P., gen. units, 250 volts D. C.
EMP—352. Coke Ovens, 302.

No. 114 Mine, Drift, No. 2 Seam, 5 ft. thick.
PO—Longacre, W. Va. SP—Same. CTY—Fayette. RR—K. & M.
MS—W. F. Mandt.
S of H—Elec. loco. and mules.
S of M—Elec.
PP—3 boilers, total 450 H. P., gen. units, 250 vols D. C., 4 pumps.
EMP—256. Coke ovens, 115.

No. 101 Mine, Drift, No. 5 Seam, 5 ft. thick.
PO—Shrewsbury, W. Va. SP—Same. CTY—Kanawha. RR—K. & M.
MS—W. F. Mandt.....Longacre, W. Va.
S of H—Elec. loco. and mules.
S of M—Elec.
PP—Boiler, 150 H. P., gen. units, 250 volts D. C., 2 pumps.
EMP—102.

No. 104 Mine, Drift, Coalburg Seam, 5 ft. thick.
PO—Cedar Grove, W. Va. SP—Same. CTY—Kanawha. RR — Kelley's Creek.
MS—Carel Robinson, Cedar Grove, W.Va.
S of H—Elec. loco. and mules.
S of M—Elec.
PP—Boilers, 150 H. P., gen. units, 250 volts D. C., 1 pump.
EMP—94.

Nos. 105 and 108 Mines; Drifts; Coalburg Seam; 60 to 72 in. thick.
PO—Mammoth, W. Va.; SP—Same; CTY—Kanawha; RR—Kelly's Creek.
MS—W. F. Mandt.....Longacre, W. Va.
S of H—3 Elec. loco. and mules. Track gauge 42 in.
S of M—13 Elec. mach.
PP—4 Return tubular boilers, total 600 H. P., 3 gen. units, 250 volts D. C.; 3 pumps.

No. 116 Mine; Drift; No. 1 Gas Seam, 72 in. thick.
PO—Harewood, W. Va.; SP—Same; CTY—Fayette; RR—K. & M.
MS—W. F. Mandt....Longacre, W. Va.
S of H—Mules and 1 Elec. loco. Track gauge 42 in.
S of M—3 Elec. mach.
PP—4 Return tubular boilers, total 600 H. P., 3 gen. units, 250 volts D. C.
Coke ovens, 166 Bee Hive.

SUPERIOR BLOCK COAL CO.
General Office, Beckley, W.Va.
Drift Mine; No. 5 Block Seam, 48 to 56 in. thick.
PO—Woodville, W.Va.; SP—Same; CTY—Lincoln; RR—C. & O., Coal River Div.
PR—G. C. Hedrick, Beckley, W.Va.
TR—B. J. Shumate, " "
Secy—John Morris, " "
GM—John Anderson, " "
EM—John S. Cole, Charleston, W.Va.
S of H—Elec. motors.
S of M—1 Elec. mach.
Note—Developing.

SUPERIOR CONNELLSVILLE COKE CO.
General Office, Greensburg, Pa.
Opekiska Mine; Drift, Pgh. Seam, 84 to 120 in. thick.
PO—Opekiska, W. Va.; SP—Same; CTY—Monongalia; RR—B. & O.
PR—Morris L. Painter..Greensburg, Pa.
TR—H. S. Schribler, " "
GM—H. S. Schribler, " "
CE—C. H. Fogg, " "
MS—S. B. Painter...Opekiska, W. Va.
SCO—Opekiska Merc. Co. Buyer, J. C. Long, Opekiska, W. Va.
S of H—Mules and 1 gasoline loco.
S of M—Hand.
EMP—60. Last fiscal year output 24,932.44 tons. Coke ovens, 20 bee hive.

SUPERIOR POCAHONTAS COAL CO.
Superior Nos. 1, 2, 3 and 4 Mines; Drift, Sewell Seam, 36 in. thick.
PO—Davy, W. Va.; SP—Same; CTY—McDowell; RR—N. & W.
PR—Justus Collins......Cincinnati, O.
TR—George Wolfe........Davy, W. Va.
GM—George Wolfe, " "
GS—H. L. Hubbard, " "
MS—H. L. Hubbard, " "
SCO—Address the Company, " "
SM—C. L. Deeds, " "
S of H—6 Elec. loco.; mules; track gauge 48 in.
S of M—5 Elec. mach.
PP—3 Atlas and Phoenix return tubular boilers, total 450 H. P., 2 gen. unis 500 volts D. C.
EMP—400. Last fiscal year output 212,000 tons.
Sales Agents, Smokeless Fuel Co., Cincinnati, O.

SUPERIOR THACKER COAL & COKE CO.
Williamson No. 1 Mine, Drift, L. Thacker Seam.
PO—Williamson, W. Va. SP—Same. CTY—Mingo. RR—N. & W.
PR—H. H. Randolph..McComas, W.Va.
GM—H. H. Randolph, " "
TR—E. V. Randolph. Williamson, W.Va.
GS—M. O. Randolph, " "
CE—H. J. Brook......Welch, W. Va.
MM—A. B. Alexander, Williamson, W.Va.
S of H—2 elec. loco. and gravity.
S of M—3 elec. mach.
PP—Power purchased.
EMP—25. Last fiscal year output 20,000 tons.
Sales agency, Mancourt Winters Coal Co., Detroit, Mich.

SYCAMORE COAL CO.
General Office, Vivian, W. Va.
Cinderella Mine, Drift, Winifrede Seam, 3½ to 6 ft. thick. Operate washery.
PO—Cinderella, W. Va., SP—Same, CTY—Mingo. RR—N. & W.
PR—S. W. Patterson....Vivian, W.Va.
TR—O. S. Patterson, " "
GM—G. S. Patterson, " "
PA—G. S. Patterson, " "
EM—J. F. Maurice, " "
EE—Carl Duty, " "
MS—Evan Thomas, (outside) Cinderella, W.Va.
MS—A. W. Greer, (Inside), Cinderella, W. Va.
SM—M. H. Gilreath, " "
S of H—Mules and 4 elec. loco., track gauge 48 in.
S of M—7 Elec. machines.
PP—2 Houston, Stanwood & Gamble return tubular boilers, total 300 H. P., 2 gen. units 250 volts D. C., 1 pump. Last fiscal year output 151,142 tons.
Sales Agents, Castner, Curran & Bullitt, Phila, Pa.

TAYLOR COLLIERIES CO.
General Office, Second National Bank Bldg, Pittsburgh, Pa.
Taylor No. 1 Mine; Drift, Pgh. Seam, 96 to 120 in. thick.
PO—Clarksburg, W .Va.; SP—Same; CTY—Harrison; RR—B. & O., Short Line Div.
PR—S. A. Taylor......Pittsburgh, Pa.
GM—S. A. Taylor, " "
CE—S. A. Taylor, " "
TR—J. M. Taylor, " "
PA—J. M. Taylor, " "
EM—D. D. Britt......Clarksburg, W.Va.
EE—Chas. Wolfe, " "
MS—D. J. Campfield, " "
S of H—2 elec. loco and mules. Track gauge 42 in.
S of M—5 Elec. mach. and hand.
PP—1 Rotary gen. set 200 K. W., gen. unit, 500 volts D. C., 1 pump; power purchased.
EMP—120. Last fiscal year output 78,083 tons
Sales Agency, Commonwealth Fuel Co., Pittsburgh, Pa.
Formerly the No. 2 Mine of the Corona Coal & Coke Co.

TEMPLETON COAL CO.
PR—W. W. Fowler......Cincinnati, O.
GM—Geo. M. Fowler......Dola, W. Va.
PA—Geo. M. Fowler, " "
GS—James Howe, " "
CE—Carl Hornor.....Clarksburg, W.Va.
Sales Agency, Matthew Addy & Co., Cincinnati, O.
Fowler No. 1 Mine, Drift; Pgh. No. 8 Seam, 8 ft. thick.
PO—Mt. Clare, W. Va.; SP—Byron, W. Va.; CTY— Harrison. RR—B. & O., W. Va. and Pgh. Div.
MS—T. L. Price.....Mt. Clare, W.Va.
S of H—Mules and rope; gauge of track 36 in.

S of M—Hand.
EMP—30. Last fiscal year output 20,000 tons.

Fowler No. 2 Mine, Drift; Pgh. No. 8 Seam, 9 ft. thick.
PO—Dola, W. Va.; SP—Robey, W. Va.; CTY—Harrison. RR—B. & O. Short Line.
MS—Jas. Howe,..........Dola, W. Va.
S of H—Mules and rope; track gauge 42 in.
S of M—Hand.
EMP—90. Last fiscal year output 65000 tons.
(Old information.)

THACKER COAL & COKE CO.
General Office 1532 Union Trust Bldg., Cincinnati, Ohio.
PR—J. Frank Black...Cincinnati, O.
VP—T. E. Houston, " "
TR—N. H. Franklin, " "
GM—T. E. Houston, " "
GS—Benjamin Lewis, Elkhorn, W.Va.
PA—N. H. Franklin.....Elkhorn, W.Va.
MM—Lee Albert, " "
EM—A. F. Marshall, Thacker Mines, W. Va.
EE Fred Boup, " "
SCO—Thacker Coal & Coke Co. Stores Buyers, J. W. Warden and P. P. Miller, Thacker Mines, W.Va.
Sales Agency, Houston Coal Co., Cincinnati, Ohio.

Thacker No. 2, Drift, Thacker Seam, 5 to 8 ft. thick.
PO—Thacker Mines, W. Va., SP—Colonel W. Va. CTY—Mingo. RR—N. & W., Thacker Branch.
MS—W. A. Wilson, Thacker Mines, W.Va.
S of H—Mules and 3 elec. loco., track gauge 44 in.
S of M—Pick mining, 1 comp. air mach. and 11 elec. machines.
PP—10 Erie and Penna. return tubular boilers, total 1300 H. P., 1 gen. unit 550 volts D. C., 1 air comp. and 1 pump
EMP—200.

Thacker No. 11, Drift, Thacker Seam, 4 to 5½ ft. thick.
PO—New Thacker, W. Va., SP—Mayo, W. Va., CTY—Mingo. RR—N. & W., Lick Fork Branch
MS—W. A. Wilson, Thacker Mines, W.Va.
S of H—Mules and 6 elec. loco. Track gauge 44 in.
S of M—8 Elec. machines.
PP—4 Return tubular boilers, total 600 H. P., 1 gen. unit 550 volts D. C., 1 pump.
EMP—200.

THERMO-POCAHONTAS COAL CO.
Thermo Mine; Drift; Beckley & Pocahontas No. 3 Seam; 68 to 78 in. thick.
PO—Bud, W. Va.; SP—Same; CTY—Wyoming; RR—Virginian.
PR—A. J. King, ...Charleston, W. Va.
GM—A. J. King " "
GS—A. J. King " "
PA—A. J. King " "
EM—A. J. King " "
TR—C. M. Galway....Pocahontas, Va.
MS—M. P. Brady........Bud, W. Va.
MM—G. D. Woolcock,....Logan, W. Va.
MS—L. L. Graybeal......Bud, W. Va.
S of H—3 elec. loco. Track gauge 44 in.
PP—Buy power.
EMP—50. Just developing.

THOMAS, D. C., COAL CO.
General Office, Columbus, O.
Grace Mine; Drift; Chilton Seam; 72 to 90 in. thick.
PO—Blair, W. Va.; SP—Same; CTY—Logan; RR—C. & O., Coal River Div.
PR—D. C. Thomas......Blair, W.Va.
GM—D. C. Thomas, " "
PA—J. O. Trumbo, " "
MS—A. R. Thomas, " "
EM—A. R. Thomas, " "
EE—J. Arbaugh, " "
TR—J. W. Blower........Columbus, O.
S of H—Mules and 1 Elec. loco.; track gauge, 44 in.
S of M—2 Arc Wall Machines.
PP—Gen. Unit, 500 volts D. C., and 2 pumps. Purchase power.
EMP—75.
Sales Agency, Hisylvania Coal Co., Columbus, O.

THOMAS COAL CO.
General Office, Bramwell, W. Va.
Thomas Mine; Drift; Pocahontas No. 3 Seam 4½ ft. thick; washery.
PO—McComas, W. Va.; SP—Mora, W. Va.; CTY—Mercer; RR—N. & W. Crane Creek Branch.
PR—L. C. Hansbrough......Salem, Va.
TR—W. J. Pritchard,..Bramwell, W. Va.
GS—W. J. Pritchard, " "
GM—W. H. Thomas, " "
PA—John Clifford....McComas, W. Va.
MS—John Clifford, " "
SM—N. J. Roberts......Crystal, W.Va.
EM—Eugene Powell, " "
EE—John Cockran, " "
S of H—4 elec. loco. and mules. Track gauge 48 in.
S of M—Elec.
PP—2 Water tube, 2 Return tubular boilers total 300 H. P., 3 gen. units, 220 A. C., 60 cycles; 2 pumps delivering water to surface and power purchased
EMP—300. Coke ovens 146 Bee Hive. Last fiscal year output 243,000 tons.
Sales Agency, Flat Top Fuel Co., Bluefield, W. Va.

THOMPSON LAND COAL COMPANY
Dorfee Mine; Drift; Winifred Seam; 48 to 60 in. thick.
PO—Dorfee, W. Va.; SP—Same; CTY—Clay; RR—Coal & Coke.
PR—James I. Thompson....Lemont, Pa.
TR—John I. Thompson, Jr., " "
GM—Chas. M. Thompson, Elkhurst, W. Va.
S of H—1 elec. loco.
S of M—5 elec. machs.
PP—2 gen. units, 250 volts D. C.
Note—Successors to Elk Manor Coal Co.

TIDEWATER COAL & COKE CO.
Tidewaater Mine, Drift, Pocahontas No. 3 Seam, 5 to 6½ ft. thick.
PO—Vivian, W. Va., SP—East Vivian, W. Va., CTY—McDowell RR—Norfolk & Western
PR—T. King..........Boston, Mass.
TR—C. H. Boardman...Vivian, W.Va.
GM—C. H. Boardman, " "
GS—Bert C. Hylton, " "
PA—C. H. Boardman, Jr. " "
EM—Bert C. Hylton, " "
MS—S. B. Campbell, " "
MM—W. F. Harris....Kimball, W.Va.
SCO—Tidewataer Coal & Coke Co., Buyer, W. E, Sult, Vivian, W.Va.
S of H—Mules and 4 Elec. loco.; track gauge 44 in.
S of M—Hand.
PP—6 Return tubular boilers, total 710 H. P., 3 gen. units 250 volts D. C. 3 pumps.
EMP—275. Coke ovens, 300. (not being 175,488 tons.

TOLBERT SMOKELESS COAL CO.
Drift Mine; Sewell Seam; 36 to 53 in. thick.
PO—Beckley, W. Va.; SP—Mabscott, W. Va.; CTY—Raleigh; RR—C. & O., Raleigh & Southwestern branch.
PR—Joe. L. Smith.....Beckley, W. Va.
TR—B. Elliott Tolbert, " "
GM—C. Prince Phillips, " "
S of H—Steam loco.
S of M—Hand.

TRACE FORK COAL CO.
Trace Fork No. 7 Mine; Drift, Poca. No. 3 Seam, 48 to 56 in. thick.
PO—Mullens, W. Va.; SP—Same; CTY—Wyoming; RR—Virginia.
PR—Hon. Edw. Cooper..Bramwell, W.Va.
TR—J. G. Thomas......Mullens, W.Va.
GM—J. G. Thomas, " "
MS—J. G. Thomas, " "
PA—N. A. Williams, " "
EM—A. B. Johnson, " "
S of H—1 Elec. loco.; track gauge 44 in.
S of M—1 Elec. mach.
PP—Power purchased.
Last fiscal year output 22,175 tons.

TRADERS COAL CO.
PR—C. L. Biddison.....Welch, W. Va.
TR—J. J. Huff.....War Eagle, W. Va.
GS—Thos. A. Shewey, " "
PA—Thos. A. Shewey, " "
MS—Thos. A. Shewey, " "
EE—Andy Gasperson, " "
SCO—Trader Coal Company. Buyer, J. J. Huff, War Eagle, W. Va.

Traders No. 1 Mine; Drift; Eagle No. 1 Seam; 48 to 84 in. thick.
PO—War Eagle, W. Va.; SP—Same (Prepay); CTY—Mingo; RR—N. & W.
S of H—1 elec. loco. Track gauge 44 in.
S of M—1 elec. mach.
PP—2 Union Iron Works return tubular boilers, total 300 H. P., 1 gen unit, 250 volts D. C., 1 pump.
EMP—40. Last fiscal year output [illegible] 000 tons.

Traders No. 2 Mine; Drift; Eagle No. 2 Seam; 48 to 72 in. thick.
PO—War Eagle, W. Va.; SP—Same; CTY—Mingo; RR—N. & W.
S of H—2 elec. locos. Track gauge 44 in.
S of M—2 elec. mach.
Note—New Mine.

TURKEY GAP COAL & COKE CO.

General Office, Dott, W. Va.
Turkey Gap and Wenonah Colliery, Drifts, Pocahontas No. 3 Seam, 48 to 54 in. thick.
PO—Dott, W. Va., **SP**—Wenonah, W. Va., **CTY**—Mercer. **RR**—N. & W., Widemouth, Branch.
PR—Frank P. Harmon..Lynchburg, Va.
TR—Jas. A. McQuail....Ennis, W.Va.
GM—Edw. J. McQuail, " "
PA—W. Henry Johnson....Dott, W.Va.
EM—Roy T. Wright....Matoaka, W.Va.
SCO—Turkey Gap Coal & Coke Co., Buyer, W. Henry Johnson. Dott, W.Va.
S of H—Mules, 4 elec. and 1 steam loco.
S of M—6 Elec. machines.
PP—Boiler 250 H.P., 2 gen. units 250 volts D.C.
EMP—275. Sales agents, Castner, Curran & Bullitt, Phila., Pa.
(Old information.)

TURKEY KNOB COAL CO.

Turkey Knob Mine, Drift.
PO—MacDonald, W. Va. **SP**—Turkey Knob, W. Va. **CTY**—Fayette. **RR**—C. & O.
GM—J. E. Beury..Macdonald, W. Va.
PA—J. E. Beury, " "
EM—S. H. Bridge. Quinnimont, W.Va.
MS—J. G. Thayer..Macdonald, W.Va.
SM—T. J. Dent, " "
S of H—Elec. loco. and mules.
S of M—Hand and elec. mach.
PP—Buy Power. 2,200 volts A. C., M. G. set, 250 K. W., 550 volts A. C., 3 phase, 60 cycles.
EMP—200.
Coke ovens—100.

UNITED STATES COAL & COKE CO.

General Office, Carnegie Building, Pittsburgh, Pa.
PR—W. H. Clingerman..Pittsburgh, Pa.
TR—J. D. McCreery, " "
Auditor—C. P. Parker, " "
PA—T. S. Duncan, " "
GS—Edward O'Toole......Gary, W.Va.
Chief EM—H. N. Eavenson, " "
SCO—United Supply Co.
Buyer, C. Boughner, " "

No. 1 Mine, Shaft, Pocahontas No. 3 and No. 4 Seams. No. 3, 5 ft. 8 in. and No. 4, 5 ft. 6 in. thick.
PO—Wilcoe, W. Va., **SP**—Same, **CTY**—McDowell **RR**—N. & W., Tug Fork
MS—John M. Tulley......Gary, W.Va.
S of H—Elec., track gauge 48 in.
Not in operation. 360 Bee Hive coke ovens, charged from No. 2 Mine.

No. 2 Mine, Slope, pocahontas No. 4 Seam, 6 ft. thick.
PO—Gary, W. Va., **SP**—Kennon, W. Va. **CTY**—McDowell. **RR**—N. & W Tug Fork Branch.
MS—John M. Tulley......Gary, W.Va.
S of H—Mules and 3 elec loco., track gauge 48 in.
S of M—7 elec. mach.
PP—1 Air comp. and 3 pumps. Power furnished from Mine No. 3. 350 Bee Hive coke ovens.

No. 3 Mine, Drift, Pocahontas No. 4 Seam, 4 ft. 8 in. thick.
PO—Gary, W Va., **SP**—Same, **CTY**—McDowell **RR**—N. & W., Tug Fork Branch.
MS—I. H. Dunn........Gary, W. Va.
S of H—2 Elec. loco. and mules., track gauge 48 in.

S of M—8 Elec. machines.
PP—12 B. & W. type Cahall water tube boilers, total 4,484 H P., 6 gen. units 6600 volts A. C., 3-phase 25-cycle, 1 air comp. and 2 pumps. 300 Bee Hive coke ovens.

Nos. 4 and 5 Mines, Drifts, Pocahontas No. 3 Seam, 6 ft. 3 in. to 7 ft. thick.
PO—Thorpe, W. Va., **SP**—Same, **CTY**—McDowell **RR**—N. & W., Tug Fork Branch.
MS—A. N. Harris......Thorpe, W.Va.
S of H—Mules and 3 elec. loco., track gauge 48 in.
S of M—15 elec. mach.
PP—Power furnished from No. 3 Mine 1 air comp. and 3 pumps. 311 Bee Hive coke ovens.

No. 6 Mine, Drift, Pocahontas No. 4 Seam, 6 ft. thick.
PO—Gary, W. Va., **SP**—Ream, W Va., **CTY**—McDowell. **RR**—N. & W. Tug Fork Branch.
MS—Neil Friel,..........Gary, W.Va.
S of H—Mules and 3 elec. loco., track gauge 48 in.
S of M—10 elec. mach.
PP—Power furnished from Mine No. 3, 1 air comp. and 2 pumps. 308 Bee Hive coke ovens.

Nos. 7 and 8 Mines, Drifts, Pocohontas No. 4 Seam, 6 ft. thick.
PO—Elbert, W. Va. **SP**—Same. **CTY**—McDowell **RR**—N. & W., Tug Fork Branch.
MS—W. P. Kearns......Elbert, W. Va.
S of H—Mules and 5 elec. loco. Track gauge 48 in.
S of M—9 elec. mach.
PP—1 Air comp. and 2 pumps. Power furnished from Mine No. 3.

No. 9 Mine; Drift; Poca No. 4 Seam; 66 to 96 in. thick.
PO—Filbert; **SP**—Same; **CTY**—McDowell; **RR**—N. & W., Tug River branch.
MS—W. W. Harding....Filbert, W. Va.
S of H—14 elec. and 1 storage battery loco. Track gauge 48 in.
S of M—14 elec. mach.
PP—From entral Station at No. 3 Mine. 1 compressor, 2 pumps.

No. 10 Mine, Drift, Pocahontas No. 3 and 4, No. 3, 5 ft. 8 in. thick and No. 4, 4 ft. 8 in. thick
PO—Gary, W Va., **SP**—Venus, W. Va., **CTY**—McDowell. **RR**—N. & W., Tug Fork Branch.
MS—I. H. Dunn........Gary, W. Va
S of H—Mules and 3 elec. loco., track gauge 48 in.
S of M—10 elec. machines.
PP—1 Air comp. and 2 pumps. Power furnished from Mine No. 3.

No. 11 Mine, Drift, Pocahontas Nos. 3 and 4 Seams, No. 3, 5 ft. 6 in. thick, and No. 4, 5 ft. thick.
PO—Thorpe, W. Va. **SP**—Same. **CTY**—McDowell. **RR**—N. & W., Tug Fork Branch.
MS—Edgar V. Albert....Thorpe, W. Va.
S of H—Mules and 2 elec. loco., track gauge 48 in.
S of M—12 Elec. machines.
PP—1 Air comp. and 2 pumps. Power furnished from Mine No. 3.

No. 12 Mine, Drift, Pocahontas No. 3 Seam, 8 ft. thick.
PO—Anawalt, W. Va., **SP**—Same, **CTY**—McDowell. **RR**—N. & W., Tug Fork Branch.
MS—Jesse H. Petty....Anawalt, W. Va.
S of H—Mules and 2 elec. loco., track gauge 48 in.
S of M—5 Elec. machines
PP—1 Air comp. and 2 pumps. Power furnished from Mine No. 3.

UNITED STATES COAL & OIL CO.

See Island Creek Coal Co.

UNITED POCAHONTAS COAL COMPANY

General Office, Crumpler, W. Va.
PR—Worth Kilpatrick..Connellsville, Pa.
TR—J. A. Armstrong, " "
GM—A. D. Rice, ...Worth, W. Va.
PA—A. D. Rice, " "
MS—H. H. Honaker..Crumpler, W. Va
EM—E. L. Bailey, " "
EE—W. O. Lambert, " "
SCO—Indian Ridge Store, Worth, W. Va., and Zenith Store, Crumpler, W. Va. Buyer, R. A. Tosh, Crumpler, W. Va.
Sales Agency, Castner, Curran & Bulitt Co., Philadelphia, Pa.

Indian Ridge Mine; Drift; No. 3 Pohahontas Seam; 54 to 60 in. thick. Operate washery.
PO—Worth, W. Va.; **SP**—Crumpler, W. Va.; **CTY**—McDowell, **RR**—N. & W., North Fork Br.
S of H—Mules and 8 elec. locos. Track gauge 48 in.
S of M—Hand and 6 elec. mach.
PP—Buy power. 4400 volts A. C., 3 phase, 60 cycles, (2) M. G. sets, 500 K. W. for all mines.
EMP—150. 200 Bee Hive coke ovens. Last fiscal year output, 176,931 tons.
Note—Formerly Indian Ridge Coal & Coke Co.

Zenith No. 1 and 2 Mines; Drift; No. 3 Pocahontas Seam; 54 to 60 in. thick. Operate washery.
PO—Crumpler, W. Va.; **SP**—Same; **CTY**—McDowell; **RR**—N. & W., North Fork Br.
MS—Address the Company.
S of H—Mules and 8 elec. locos.
S of M—4 elec. mach.
PP—Two 500 K. W. Motor Generator Sets, 440 volts A. C., 3 phase, 60 cycles. Purchase power.
EMP—140. Last fiscal year output 141,911 tons.

Wyoming No. 1 and 2 Mines; Drift; No. 3 Pocahontas Seam; 52 to 56 in. thick. Operate washery.
PO—Crumpler, W. Va.; **SP**—Same; **CTY**—McDowell, **RR**—N. & W., North Fork Br.
MS—Address the Company.
S of H—Mules.
PP—Purchase power.
EMP—15. Last fiscal year output 5010 tons.

UPLAND COAL & COKE CO.

General Office, Elkhorn, W. Va.
Upland No. 1 Mine, Drift Mine, Pocahontas No. 3 Seam from 7 to 9 ft. thick.
PO—Elkhorn, W. Va. **SP**—Same. **CTY**—McDowell. **RR**—N. & W.
PR—Louis R. Page, Philadelphia, Pa.
TR—Louis R. Page, " "
GM—John J. Lincoln, Elkhorn, W. Va.
GS—John J. Lincoln, " " "
PA—Thomas Miller, " " "
CE—Crozer Land Ass'n, " " "
MM—Allen Raup, " " "
EE—Allen Raup, " " "
SB—Thomas Miller, " " "
MS—Jos. McCrickard, " "
S of H—2 Elec. loco, Track gauge, 44 in.
S of M—Hand.
PP—4 Return tubular boilers, total 550 H. P. 1 gen. unit, 500 volts D. C.
EMP—370. Annual output 359,758
Sales Agents, Crozer-Pocahontas Co., Bluefield, W. Va. 216 Bee Hive coke ovens.

VINCENT COAL CO.

Gresselli; Drift; Pgh. Seam, 84 to 96 in. thick.
PO—Clarksburg, W. Va. **SP**—Same. **CTY**—Harrison. **RR**—B. & O.
PR—Wm. Atkins, ..Philadelphia, Pa.
TR—Wm. Atkins, " "
GM—V. E. Gocke, Clarksburg, W. Va.
GS—V. E. Gocke, " " "
PA—V. E. Gocke, " " "
EM—D. D. Britt, " "
S of H—Mules.
S of M—Hand.
EMP—125. Last fiscal year output, 72,000 ons.

VIRGINIA-BUFFALO COAL CO.

General Office, Huntington, W. Va.
PR—Geo. M. Jones, " " " "
TR—E. J. Payne, " " " "
GM—J.N. Schweitzer, Amherstdale, W.Va.
GS—J. N. Schweitzer, " " "
PA—J. N. Schweitzer, " " "
SM—C. W. Hardy, " " "
EM—W. C. McCall......Logan, W. Va.
MM—N. C. Schweitzer, Amherstdale, W. Va.
Sales Agents, John T. Hesser Coal Co., Cincinnati, O.

Amherst Mine, Drift, Thacker No. 2 Gas, or Island Creek Seam, 4½ to 9 ft. thick
PO—Robinette, W. Va. **SP**—Amherstdale, W. Va. **CTY**—Logan. **RR**—C. & O., Guyan Valley Branch, Buffalo Extension.
S of H—Mules and 2 elec. locos. Track gauge 44 inches.
S of M—2 Electric machines.
PP—2 Erie City Iron Works return tubular boilers, total 300 H. P. 1 Gen. unit 250 volts D. C.
EMP—75. Last fiscal year output, 50,000 tons.

Virginia-Buffalo Mine, Drift, Eagle Sam; 56 to 96 in. thick.
PO—Amherstdale, W. Va.; **SP**—Same; **CTY**—Logan; **RR**—C. & O., Guyan Valley Br., Buffalo Extension.
S of H—Mules. Track gauge 36 in.
S of M—2 Elec. machines.
PP—1 Nagal 80 H. P. boiler. 1 Gen. unit 250 volts D. C.
EMP—50. Last fiscal year output, 40,353 tons.

Huddleston Mine; Drift; Eagle Seam, 56 to 84 in. thick.
PO—Accoville, W. Va.; **SP**—Bayman; W. Va.; **CTY**—Logan; **RR**—C. & O. G. V. branch.
S of H—1 elec. loco. and mules. Track gauge 44 in.
S of M—2 elec. mach.
PP—2 return tubular boilers, total 300 H. P., gen. unit, 250 volts D. C.
EMP 50. Last fiscal year output 50,000 tons.
Note—This mine was formerly operated by The Huddleston Coal & Coke Co.

VIRGINIA & PITTSBURGH COAL & COKE CO. (THE)

General Office, Fairmont, W. Va.
Kingmont and Morgan Mines; Drift, Pgh. Seam, 96 to 108 in. thick.
PO—Kingmont, W.Va.; **SP**—Same; **CTY**—Marion; **RR**—B. & O.
PR—R. M. Hite, ...Fairmont, W.Va.
GM—R. M. Hite, " "
TR—Joseph R. Tindall, Stephen Girard Bldg., Philadelphia, Pa.
PA—R. R. Hunsaker, Kingmont, W. Va.
ME—H. G. Larew, Independence, W. Va.
EE—Arthur Jarrett.....Watson, W. Va.
SM—F. O. Himebaugh, Kingmont, W. Va.
S of H—3 Elec., 1 gasoline loco., mules and rope; track gauge 42 in.
S of M—Hand.
PP—5 return tubular boilers, total 580 H. P., 1 gen. unit, 250 volts D. C., 3 pumps.
EMP—340. Last fiscal year output 480,000 tons.
Coke ovens 50 Bee Hive.
Sales Agency—Hite & Rafetto, 727 Stephen Girard Bldg., Philadelphia, Pa.

VIRGINIA COAL COMPANY.

Out of business.

VIRGINIA-MARYLAND COAL CORP.

General Office, Adamston, W. Va.
PR—Lilburn T. Myers, Richmond, Va.
TR—A. P. Adams, ...Baltimore, Md.
Auditor, R. T. Naylor, " "
GM—Irving Adams, " "
GS—A. L. White, Adamston, W. Va.
PA—A. L. White, " " "
CE—Horner Bros., Clarksburg, W. Va.
SM—T. N. Mason, Shinnston, W. Va.
Sales agency, S.M. Hamilton Coal Co., Baltimore, Md.

Williard Nos. 1, 2 and 3, Drift, Pgh. Seam, 7½ ft. thick.
PO—Adamston, W. Va. **SP**—Shinnston, W. Va. **CTY**—Harrison. **RR**—B. & O.
MM—Amos Reese, Shinnston, W. Va.
S of H—3 Gasoline loco. and mules. Track gauge 42 in.
S of M—16 comp. air mach.
PP—3 Return tubular, Atlas and Erie boilers, total 450 H. P. 2 compressors and 6 pumps.
EMP—200. Last fiscal year output, 200,000 tons.

Scotch Hill Mine, Shaft, Kittanning Seam, 4½ ft. thick.
PO Adamston. W. Va.; **SP**—Newburg; **CTY**—Harrison; **RR**—B. & O.
MM—Tom Turnley, ..Newburg, W. Va.
MS—L. C. Stevenson, " " "
S of H—1 Gasoline loco and mules. Track gauge 42 in.
S of M—6 Comp. air mach.
PP—3 Erie Return tubular boilers, total 450 H. P. 1 compressor and 2 pumps.
EMP—100. Last fiscal year output, 60,000 tons.

VIRGINIA SMOKELESS FUEL CO.

Shaft Mine; Pocahontas No. 3 Seam; 44 to 56 in. thick.
PO—Newlest, W. Va.; **SP**—Same; **CTY**—Wyoming; **RR**—Virginian.
PR—W. E. Deegans, Mt. Hope, W. Va.
GM—W. E. Deegans, " "
TR—L. N. Frantz, ...Mullens, W. Va.
GS—B. D. Dunman, " "
CE—Philip Konrad, Kanawha Falls, W. Va.
SM—N. D. Trent.....Newlest, W. Va.
S of H—1 storage battery loco. Track gauge 44 in.
S of M—1 elec. mach.
EMP—50.

VULCAN COAL CO.

Vulcan Mine; Drift; Vulcan Seam, 48 to 96 in. thick.
PO—Vulcan, W. Va. **SP**—Delorme, W. Va. **CTY**—Mingo. **RR**—Norfolk & Western, Pocahontas branch.
PR—W. C. Stephenson, Roanoke, W. Va.
TR—W. C. Stephenson, " " "
GM—Roger Martin, .. Vulcan, W. Va.
GS—Roger Martin, " " "
PA—Roger Martin, " " "
MM—Albert Mowry, " " "
EE—Albert Mowry, " " "
CE—Mum & Haskins..Bluefield, W. Va.
EM—Mum & Haskins, " "
MS—Lawrence Sheppard..Vulcan, W. Va.
SCO—Address the Company. Buyer, F. C. Thornton, Vulcan, W. Va.
S of H—Mules and 3 elec. locos. Track gauge 56½ in.
S of M—3 elec. mach.
PP—2 Return tubular boilers, total 250 H. P., 1 gen. unit, 250 volts D. C. Purchase power.
EMP—127. Last fiscal year output 105,373 tons.

WAKE FOREST MINING CO.

Wake Forest Mine; Drift; No. 2 Kanawha, Gas Seam; 54 to 78 in. thick.
PO—Wake Forest, W. Va. **SP**—Same. **CTY**—Kanawha. **RR**—C. & O.
PR—J. C. Grymes, Wake Forest, W. Va.
TR—J. C. Grymes, " " " "
GM—J. C. Grymes, " " " "
PA—J. C. Grymes, " " " "
MS—J. W. Gay, " " " "
EE—M. A. Leach, " " " "
SM—M. A. Cramer, " " " "
S of H—Mules and 2 Elec. loco.; track gauge 42 in.
S of M—5 Elec. machines.
PP—2 Return tubular boilers, total 300 H. P. 1 Gen. unit, 500 volts D. C., 1 pump.
EMP—110. Last fiscal year output, 98,000 tons. Sales agency, Carbon Fuel Co., Cincinnati, Ohio.

WAR EAGLE COAL CO.

War Eagle, Starr, Pappoose and Mephisto Mines, Drifts, War Eagle Seams, No. 1 and 2, 57 to 66 in. thick.
PO—War Eagle, W. Va. **SP**—Same (Prepay); **CTY**—Mingo; **RR**—N. & W.
PR—W. A. Hurst....Williamson, W.Va.
TR—Alex. Bishop, " "
GM—Geo. W. Coffey..War Eagle, W.Va.
PA—Geo. W. Coffey, " "
GS—G. W. Coffey, " "
MM—T. Cole, " "

CE—D. M. Good....Williamson, W.Va.
SCO—War Eagle Supply Co., Buyer S. K. Varney, War Eagle, W. Va.
S of H—4 steam loco. and mules. Track gauge 44 in.
S of M—24 Compressed air machines.
PP—7 Erie water tube boilers, total 1,050 H. P., 2 compressors.
EMP—200. Last fiscal year output 250,000 tons.

WARNER BLOCK COAL CO.
General Office, Morrisvale, W. Va.
Drift Mine; Horse Creek Splint Seam; 48 in. thick.
PO—Morrisvale, W. Va.; SP—Same; CTY—Boone; RR—C. & O., Coal River Div.
PR—W. H. Warren......Cleveland, O.
TR—Whitney Warner, " "
GM—John H. Walker, " "
PA—John H. Walker, " "
EM—R. S. Walters..Charleston, W. Va.
EE—C. F. Scheerin..Morrisvale, W. Va.
S of H—1 elec. loco. Track gauge 42 in.
S of M—2 elec. machs.
PP—Purchase power.
Note—At present engaged in development work. Expect to commence shipping coal October 1st, 1916.

WARRIOR COAL CO.
Warrior Mine; Drift War Creek Seam; 5 to 6 ft. thick.
PO—War, W. Va.; SP—Warrior Siding, W. Va.; CTY—McDowell; RR—N. & W., War Creek Br.
PR—H. E. Harman......Tazewell, Va.
GM—W. T. Williams..Bluefield, W.Va.
GS—W. T. Williams, " "
CE—W. T. Williams, " "
TR—W. Henry Johnson....War, W.Va.
PA—W. Henry Johnson, " "
EM—G. D. Davidson, " "
MS—D. Davidson, " "
SCO—Warrior Coal Co. Store, Buyer, W. Henry Johnson, War, W. Va.
S of H—Elec. loco.
S of M—Elec. mach.
PP—Purchase power.
EMP—150.
Sales Agency, Norfolk & Chespeake Coal Co.

WEBB COAL MINING CO.
General Office, Cincinnati, O
Webb Mine; Drift; Coalburg Seam, 80 to 98 in. thick.
PO—Garrison, W. Va.; SP—Ferndale, W.Va.; CTY—Boone; RR—C. & O., Cabin Creek Br.
PR—L. M. Webb, ...Cincinnati, O.
TR—L. M. Webb, " "
GM—John Holmes, ...Garrison, W.Va.
S of H—4 elec. loco. Track gauge 42 in.
S of M—6 Elec. mach.
PP—2 Houston-Stanwood & Gamble, return tubular boilers, total 300 H.P., 2 pumps.
EMP—125. Last fiscal year output 88,000 tons.
Sales Agency, The Webb Fuel Co., Cincinnati, O.

WEIRICH & GIBSON
General Office, Kingwood, W. Va.
Drift Mine; Mahoning Seam; 36 in. thick.
PO—Kingwood, W. Va.; SP—Same; CTY—Preston; RR—W. V. N.
GM—J. H. Weirich...Kingwood, W. Va.
S of H—Gravity.
S of M—Hand.
Weekly output, 50 tons.

WELCH COAL CO.
General Office, Cincinnati, O.
Welch and Hemphill Mines; Drifts; Welch Pocahontas Seam; 46 to 75 in. thick.
PO—Welch, W. Va.; SP—Same; CTY—McDowell RR—N. & W.
PR—E. J. Howe........Cincinnati, O.
TR—S. A. Joy.......Freeman, W. Va.
GM—F. J. Baxter......Welch, W.Va.
MS—F. J. Baxter, " "
PA—F. J. Baxter, " "
EM—H. J. Brook, " "
SCO—Welch Coal Co., Buyer, L. J. Brindley, Welch, W. Va.
S of H—4 elec., 1 storage battery and 1 gasoline loco. Track gauge 48 in.
S of M—Hand and 8 comp. air mach.
PP—2 Return tubular boilers, total 180, H. P., 1 air camp., 6 pumps. Buy electric power.
EMP—100 Last fiscal year output 100,000 tons.
Sales Agency, Castner, Curran & Bullitt.

WEST VIRGINIA COAL MINING CO., THE
General Office, Richmond, Va.
Wesvaco Mine; Drift; Sewell Seam; 40 to 48 in thick.
PO—Skelton, W. Va.; SP—Same; CTY—Raleigh; RR—C. & O. and Virginian, P. C. & P.
PR—E. S. Simpson......Richmond, Va.
TR—M. L. Norvell, " "
GM—T. R. Ragland....Skelton, W.Va.
GS—T. R. Ragland, " "
PA—T. R. Ragland, " "
CE—T. R. Ragland, " "
MS—Van Johnson, " "
EM—H. M. Scott......Beckley, W.Va.
SCO—West Va. Coal Mng. Co., Buyer T. Ragland, Skelton, W. Va.
S of H—1 Gasoline loco. and mules.
S of M—Hand.
PP—Purchase power.
EMP—40.

WESTERN MARYLAND COAL CO.
Kittanning Nos. 1 and 2 Mines.
PO—Blaine, W. Va.; CTY—Mineral.
No report.

WEST VIRGINIA GAS COAL COMPANY
General Office, Hugheston, W. Va.
No. 4 Mine; Drift; No. 2 Gas Kanawha Series, 48 to 52 in. thick.
PO—Hugheston, W. Va.; SP—Same; CTY—Kanawha; RR—K. & M.
PR—A. B. Koontz...Charleston, W. Va.
TR—H. P. Tompkins, Hugheston, W. Va.
SM—H. P. Tompkins, " "
PA—E. L. Michie, " "
GM—E. L. Michie, " "
MF—P. L. Murphy, " "
SCO—West Virginia Gas Coal Co., Hugheston, W. Va.
S of H—5 elec. locos. Track gauge 42 in.
S of M—6 elec. mach.
PP—2 return tubular W. T. boilers, total 410 H. P., 2 gen. units, 250 volts D. C., 1 pump. Purchase power.
EMP—100. Started Feb. 1st, 1916.

WEST VIRGINIA COLLIERY CO.
No. 1, 3, 4 Mines; Drift; Kanawha and Gas, Acme splint Seams, 66 to 84 in. thick.
PO—Wevaco, W Va. CTY—Kanawha. RR—C. & O.
PR—J. R. Thomas, Charleston, W. Va.
TR—C. A. Cabell, .. Carbon, W. Va.
GM—C. A. Cabell, " " "
PA—G. K. Cabell, Wevaco, W. Va.
SM—G. K. Cabell, " " "
Auditor—E. C. Hanna, " " "
EE—T. A. McGary, " " "
MS—G. K. Quarrier, " " "
S of H—8 elec. loco. Track gauge 44 in.
S of M—9 Elec. mach.
PP—Power purchased.
EMP—250. Last fiscal year output, 303,000 tons.

WEST VIRGINIA MIDLAND COLLIERIES CO.
General Office, Stock Exchange Bldg., Phila., Pa.
PO—Halley, W. Va.; CTY—Webster.
TR—J. A. Ballinger....Philadelphia, Pa.
Note—Just commencing development.

WEST VIRGINIA-PITTSBURGH COAL CO.
General Office, House Bldg., Pittsburgh, Pa.
PR—Ed. J. House, House Bldg., Pittsburgh
TR—J. M. Irwin,......Pittsburgh, Pa.
GM—Hebron Robison, 710 House Bldg., Pittsburgh, Pa.
PA—Hebron Robison, 710 House Bldg., Pittsburgh, Pa.
GS—W. D. McCausland, 710 House Bldg., Pittsburgh, Pa.
CE—W. H. Bradford, Empire Bldg., Pittsburgh, Pa.
EM—N. J. Wyeth......Colliers W. Va.
Sales Agent, Hebron Robison, 701 House Building, Pittsburgh, Pa.

Colliers No. 1 Mine; Drift; Pgh. Seam, 56 to 60 in. thick.
PO—Colliers, W. Va. SP—Same. CTY—Brooke. RR—P. C. C. & St. L.
MS—J. A. Smith......Colliers, W. Va.
S of H—4 elec. loco. Track gauge 42 inches.
S of M—9 Elec. machines.
PP—2 Erie and 2 Titusville return tubular boilers, total 600 H. P. 2 Gen. units 250 volts D. C. 5 pumps.
EMP—224. Last fiscal year output 213,111 tons.

Gilchrist No. 3 Drift, Pittsburgh Seam, 4ft. 8 in. to 5½ ft. thick.
PO—Wellsburg, W. Va. SP—Same. CTY—Brooke. RR—P.C.C.&St. L., P. N. & K. Branch.
MS—Seth P. Stevenson, Wellsburg, W.Va.
S of H—Mules and 1 elec. loco. Track gauge 40 inches.
S of M—4 elec. mach.
PP—2 Return tubular boilers, total 200 H. P. 1 Gen. unit 250 volts D. C., 4 pumps.
EMP—95. Last fiscal year output 52,610 tons.

La Belle No. 4, Drift, Pittsburgh Seam, 4 ft. 8 in. thick.
PO—Wellsburg, W. Va. SP—Same CTY—Brooke. RR—P.C.C. & St. L., P. N. & K. Branch.
MS—John McMahon..Wellsburg, W. Va.
S of H—2 Elec. loco. Track gauge 42 in.
S of M—7 elec. mach.
PP—Purchase power, 3 pumps.
EMP—167. Last fiscal year output 101,486 tons.

WEST VIRGINIA POCAHONTAS COAL CO.
PR—Wm. Leckie........Welch, W.Va.
GM—Wm. Leckie, " "
CE—J. H. Williams, " "
EM—J. H. Williams, " "
TR—A. G. Edwards..New York, N. Y.
GS—Wm. Smith........Leckie, W.Va.
PA—Wm. Smith, " "
SCO—West Virginia Pocahontas Coal Co., Buyer, W. S. Morris, Leckie, W.Va.
Sales Agency West Virginia Pocahontas Coal Sales Corp., Norfolk, Va.

Leckie No. 1 Mine; Drift; Pocahontas No. 3 Seam; 90 to 108 in. thick.
PO—Leckie, W. Va.; SP—Same; CTY—McDowell; RR—N. & W.
S of H—1 Elec. loco. and mules.
S of M—Hand.
PP—2 Gen. units, 250 volts, D. C. power purchased.
EMP—85.

Leckie No. 2 Mine; Drift; Pocahontas No. 3 Seam; 90 o 108 in. thick.
PO—Leckie, W. Va.; SP—Same; CTY—McDowell; RR—N. & W.
S of H—2 elec. loco and mules. Track gauge 36 in.
S of M—1 Elec. mach.
PP—Gen. units, 250 volts D. C., power purchased.
EMP—75. Last fiscal year output for both mines 199,453 tons.

WEST VIRGINIA PULP & PAPER CO.
Hopkins No. 1 Mine, Drift, Sewell Seam. 5 ft. thick.
PO—Piedmont, W. Va.; CTY—Randolph; RR—C. & O.
GS—E. P. Shaffer .....Cass, W. Va
EMP—17.

WEST VIRGINIA RAIL & RIVER COAL CO.
General Office, Columbus, Ohio.
Hallwood Mine; Drift; Pittsburgh Vein Seam; 54 to 72 in. thick.
PO—Spilman, W. Va.; SP—Same; CTY—Mason; RR—B. & O.
PR—S. F. L. Dean.......Columbus, O.
TR—W. W. Daniel, " "
GM—John T. Carding..Spilman, W. Va.
GS—David Cook, " "
MS—Geo. Carding, " "
EE—John Gibbs, " "
PA—E. E. Hazelton.....Columbus, O.
SCO—Thomas Fork Store Co. Buyer, E. C. McKelvey, Spilman, W. Va.
S of H—2 elec. locos. Track gauge 39 in.
S of M—6 elec. machs.
PP—2 water tube boilers, total 300 H. P., one gen. unit, 250 volts D. C., 2 pumps.
EMP—150.

WEYANOKE COAL & COKE CO.
Weyanoke and Elihu Mines, Drifts, Pocahontas No. 3 Seam.
PO—Lowe, W. Va. SP—Weyanoke, W. Va. CTY—Mercer. RR—Virginian Ry., Widemouth Branch, N. & W.
PR—R. D. Patterson.......Dayton, O.
TR—H. J. Dreese, " "
GM—R. D. Patterson, " "
GS—W. A. Craven.......Lowe, W. Va.
PA—W. A. Craven, " "
MM—C. R. Hawks, " "
EE—L. T. Williams....Lowe, W.Va.
SM—W. M. Miller, " " "
S of H—Mules and 9 elec. loco. Track gauge 56½ in.
S of M—Pick and 5 elec. mach.
PP—3 Brownell water tube boilers, total 450 H. P. 3 Gen. units, 250 volts D. C.
EMP—250. Last ficsal year output, 190,000 tons. Sale agency, S. J. Patterson Co., Dayton, Ohio.

WHEELING STEEL & IRON CO.
Benwood Mine; Drift; Pittsbuogh No. 8 Seam; 78 in. thick.
PO—Wheeling, W. Va.; SP—Benwood, W. Va.; CTY—Ohio; RR—P. C. C. & St. L., B. & O., and W. B. T.
PR—Isaac M. Scott....Wheeling, W.Va.
TR—C. J. Hunter, " "
GS—J W. Carpenter, " "
PA—E. D. Adams, " "
EE—C. E. Bedell, " "
MS—R. Z. Virgin, " "
CE—S. Dieschel & Sons, " "
S of H—6 elec. loco. Track gauge 42 in.
S of M—6 Elec. mach.
PP—Gen. units, 250 volts, D. C. Purchase power.
EMP—150.

WHITE STAR MINING CO
General Office, Dayton, O.
Alma Mine; Drift, Alma, Thacker, White Star Seam, 48 to 50 in. thick.
PO—Merrimac, W. Va.; SP—Same, (Prepay); CTY—Mingo; RR—N. & W.
PR—R. D. Patterson........Dayton, O.
TR—H. J. Dreese, " "
GM—R. D. Patterson, " "
PA—G. W. Welch......Merrimac, W.Va.
MS—G. W. Welch, " "
EE—S. J. Short, " "
EM—D. M. Good....Williamson, W.Va.
SCO—White Star Mng. Co. Store. Buyer, Geo. H. Perkins, Merrimac, W. Va.
S of H—1 elec. loco. and mules.
S of M—4 elec. mach.
PP—2 Return tubular boilers, total 200 H. P., 2 gen. units 250 volts D. C.
EMP—150. Last fiscal year output 80,000 tons.
Sales Agency, The S. J. Patterson Co., Dayton, O.

WHITAKER-GLESSNER CO.
General Office, Wheeling, W. Va. 1 mine in West Virginia, 1 mine in Ohio.
Carter Mine, Drift, Pittsburgh No. 8 Seam, 5 ft. thick.
PO—Wheeling, W. Va. CTY — Ohio.
PR—Alex. Glass, .. Wheeling, W. Va.
TR—G. W. Hocking, " "
GS—Harry Hocking, " "
MS—W. H. Kasley, " "
MM—J. E. Montgomery, " "
S of H—1 Elec. loco. Track gauge 34 inches.
S of M—2 Elec. machines.
PP—Power furnished from our Mill plant.
EMP—50. Last fiscal year output, 48,000 tons.

WHITE, E. E., COAL CO.
General Office, Glen White, W. Va.
TR—P. A. Vought,. Mount Carmel, Pa.
PR—E. E. White, Glen White, W. Va.
GM—E. E. White, " " " "
GS—E. E. White, " " " "
PA—E. E. White, " " " "
EM—Robt. F. Roth, " " " "
MM—Wm. White, " " " "
EE—C. R. Stahl Stotesbury, W. Va.
Sales agency, Castner, Curran & Bullitt, Philtdelphia, Pa.

Glen White Mine, shaft; Beckley Seam, 4 to 7 ft. thick.
PO—Glen White, W. Va. SP—Same and Lester, W. Va. CTY —Raleigh. RR C. & O., Piney Branch, Virginian.
MS—F. J. McHugh, Glen White, W. Va.
SM—C. L. Pauley, " " " "
S of H—11 Elec. loco. Track gauge 44 in.
S of M—8 Elec. mach. and hand.
PP—6 Water tube boilers, total 2100 H. P., 2 gen. units, 6,600 volts A. C., 3 phase, 25 cycles, 1 pump.
EMP—315. Last fiscal year output 300,860 tons.

Stotesbury Mine, Drift, Beckley Seam, 4 to 7 ft. thick.
PO—Stotesbury, W. Va. SP—Same. CTY—Raleigh. RR — C. & O., Piney Creek Branch.
MS—C. R. Stahl, Stotesbury, W. Va.
SM—J. K. Hedges, " " "
S of H—12 Elec. loco.; track gauge 44 in.
S of M—11 Elec. mach . and hand.
PP—Power furnished from Glen White Mine, 1 pump delivering water to surface.
EMP—330. Last fiscal year output 276,245 tons.

WHYEL COAL CO.
General Office, Uniontown, Pa.
Kilarm Mine; Drift; Pittsburgh Seam, 84 to 96 in. thick.
PO—Monongah, W.Va.; SP—Kilarm, W.Va.; CTY—Marion; RR—B. & O., Kilarm Br.
PR—Harry Whyel, . Uniontown, Pa.
TR—George Whyel, " "
MS—E. E. Ober.....Monongah, W. Va.
EM—West Virginia Engineering Co., Fairmont, W.Va.
S of H—1 Elec. loco. and mules; track gauge 42 in.
S of M—3 Elec. mach.
PP—1 Return tubular boiler, total 150 H. P., gen. unit, 250 volts D. C., 1 pump.

WILLIAMS COAL CO.
Out of business.

WILLIAMS POCAHONTAS COAL CO.
Howard Mine; Drift; War Creek Seam; 66 to 72 in. thick.
PO—War, W. Va.; SP—Same; CTY—McDowell; RR—N. & W., War Creek Br.
PR—F. W. Truscot,......War, W. Va.
TR—Robt. L. Page...Berwind, W. Va.
GM—F. W. Truscott.......War, W.Va.
PA—F. W. Truscott, " "
MS—F. W. Truscott, " "
CE—H. J. Brook,........Welch, W.Va.
EM—H. J. Brook " "
S of H—Mules and 1 elec. loco.
S of M—1 elec. mach.
PP—Buy power.
Sales Agency, Norfolk and Chesapeake Coal Co.
Just started to run coal, 5-20-16.

WILLIAMSON COAL & COKE CO.
Williamson No. 3 Mine; Drift, Winifrede and Thacker seams.
PO—Williamson, W. Va. SP—Same. CTY—Mingo. RR—N. & W.
GM—E. L. Bailey, Williamson, W. Va.
PA—E. L. Bailey, " " "
EM—D. M. Good, War Eagle, " "
MS—J. F. Jones, Williamson, W. Va.
SM—Thos. Thompson, " " "
S of H—Elec. loco.
S of M—Elec. mach.
PP—4 boilers, total 500 H. P., 2 gen. unit, 250 volts D. C.
EMP—250.

WILLIS BRANCH COAL CO.
No. 1 Mine; Drift; Long Branch Seam, 70 to 78 in. thick.
PO—Herberton, W. Va.; SP—Same (Prepay); CTY—Fayette; RR—Virginian.
PR—T. .K Laing, Willis Branch, W. Va.
GM—T. K. Laing, " "
PA—T. K. Laing, " "
MS—Frank Williams, " "
SCO—J. S. Davis & Co., " "
CE—Clark & Krebs. .Charleston, W.Va.
TR—Thomas Nichol. .Glen Jean, W. Va.
S of H—1 Gasoline loco. nad mules gravity.
S of M—Hand, rope and 1 gasoline loco. Track gauge 44 in.
EMP—100.

WILLS, JOHN
General Office, Penna. Bldg., Philadelphia, Pa. 1 mine in W. Virginia and 3 mines in Penna.
Wills No. 4 Mine; Drift; Kittanning Seam; 84 to 96 in. thick.
PO—Corinth, W. Va. SP—Same. CTY Preston; RR—B. & O.
GM—John Wills, Philadelphia, Pa
PA—M. C. Kelly,.. Corinth, W. Va.
MS—M. C. Kelly, " " "
S of H—Mules and rope. Track gauge 42 in.
S of M—Hand.
EMP—24.

WILSON, H. T. COAL CO.
General Office, 1118 Majestic building, Detroit, Mich.
Wilson Mine, Drift, Eagle Seam, 5½ ft. thick.
PO—Logan, W. Va., SP—Same, CTY—Logan. RR—C. & O.
PR—H. T. Wilson......Detroit,Mich.
VP—A. B. Moore........Detroit, Mich.
TR—W. H. H. Dorney, " "
GM—H. T. Wilson, " "
GS—Thomas Wilson ....Logan, W.Va.
PA—Thomas Wilson, " "
MS—B. B. Wilson, " "
EM—J. McCorkle, " "
MM—A. F. Mitchell...Logan, W. Va.
SCO—H. T. Wilson Supply Co., Buyer, H. H. Oakley, " "
S of H—5 elec. loco. Track gauge 44 in
S of M—5 Elec. machines.
PP—Buy power. 250 volts D. C.
EMP—105. Last fiscal year output 105,000 tons.
Sales Agency, Norfolk & Ches. Coal Co.

WINCHESTER COAL CO.
Winchester Mine, Drift, Pgh., Seam, 5 to 8 ft. thick.
PO—Enterprise, W. Va.; SP—Same; CTY—Harrison RR—B. & O.
PR—Jas. Laulis.....Enterprise, W.Va.
GS—J. W. Duckworth, " "
TR—Thomas H. Laulis, " "
EM—Hornor Bros.....Clarksburg, W.Va.
SCO—Winchester Coal Co. Store. Buyer, Thos. H. Laulis, Enterprise, W. Va.
S of H—Mules, track gauge 44 in.
S of M—2 Elec., mach.
PP—1 Fan and 1 pump, power purchased
EMP—35. Last fiscal year output 48,000 tons.
Sales Agent, Thomas H. Laulis, Enterprise, W. Va.

WINDING GULF COLLIERY CO.
PR—Justus Collins, Cincinnati, O.
Secy—Geo. P. Daniels, " "
VP—J. A. Renahan....New York, N. Y.
TR—Geo. Wolfe....Winding Gulf, W.Va.
GM—Geo. Wolfe, " "
GS—F. M. Cook, " "
PA—J. M. Herndon, " "
EM—A. K. Mintes, " "
MM—Frank Hill, " "
EE—Frank Hill, " "
SCO—Winding Gulf Colliery Co., Winding Gulf, W. Va.
Sales Agency Smokeless Fuel Co., Cincinnati, Ohio.

Nos. 1 and 3 Mines; Slope; Beckley Seam; 48 to 72 thick.
PO—Winding Gulf, W. Va.; SP—Same; CTY—Raleigh; RR—Virginian.
MS—Henry Reed, Winding Gulf, W.Va.
S of H—11 Elec. loco.; track gauge 44 in.
S of M—7 Elec. mach.
PP—2 S. Freeman & Sons water tube boilers, total 700 H. P., 2 gen. units, 250 volts D. C.; 1 pump.

No. 2 Mine; Shaft; Beckley Seam; 48 to 72 in. thick.
PO—Winding Gulf, W. Va.; SP—Same; CTY—Raleigh; RR—C. & O.
MS—George Swim, Winding Gulf, W. Va.
S of H—6 elec. loco. Track gauge 44 in.
S of M—3 Elec. mach.
PP—1 Pump. Purchase power.
EMP—700, at all mines. Last fiscal year output 450,000 tons, for all mines.

WINIFREDE COAL CO.
General Office, Winifrede, W. Va.
PR—J. J. Sullivan, Jr....Phila., Pa.
TR—Frank B. Stewart, Winifrede,W.Va.
GM—Frank B. Stewart, " "
GS—Frank D. Barron, " "
PA—W. H. W. Mason, " "
CE—R. P. Boykin, " "
EM—R. P. Boykin, " "
EE—J. L. Gleason, " "
SM—H. M. Petty, " "
Sales Agents, Winifrede Coal Co., Frank B. Stewart, Cincinnati, O.

North, South and West Mines, Drifts, Winifrede Seam, 4 ft. 2 in. to 6 ft. 2 in. thick. Operate washery.
PO—Winifrede, W. Va., SP—Winifrede Jct., W. Va., CTY—Kanawha. RR—C. & O., Winifrede Br.
S of H—Mules and 6 elec. loco., track gauge 42 in.
S of M—Hand and 12 elec. machines.
PP—Purchase power.
EMP—500. Last fiscal year output, 186,000 tons.

Belmont Mine, Drift, Old Coalburg Seam, 4 ft- 8 in. to 6 ft. 6 in. thick.
PO—Crown Hill, W. Va.; SP—Paint Creek Jct., W. Va.; CTY— Kanawha; PR—C. & O.
S of M—Hand and 5 elec. machines.
PP—Purchase power.
EMP—88. Last fiscal year output 76,800 tons.
MS—J. S. Miller....Crown Hill, W.Va.
SM—Geo. Hudnall, " " "
S of H—Mules and 2 elec. loco. Track gauge 42 inches.

WINONA COAL & COKE CO.
Nos. 1 and 2 Mines.
PO—Grafton, W. Va. SP—Coffman, W. Va. CTY—Taylor.
MS—E. R. Short....Grafton, W.Va.

WOLF, ERTLE & ONDO.
Drift Mine; Pgh. Seam..
PO—Wellsburg, W.Va.; CTY—Brooke; RR—W. B. & Wash.
TR—Stephen Ertle, ..Wellsburg, W.Va.
S of H—Mules; track gauge 38 in.
S of M—1 Elec. mach.
EMP—10.
Sales Agent, Leopold Wolf, Wellsburg, W.Va.

WOOD PECK COAL CO.
Wood Peck Mine, Drift, Beckley Seam, 4 ft. to 5 ft. thick.
PO—Sullivan, W. Va. SP—Wood Peck, W. Va., CTY—Raleigh. RR—C. & O., Raleigh & S. W.
PR—W. W. Koiner....Sullivan, W.Va.
TR—Fred G. Wood, " "
GM—Fred G. Wood, " "
PA—Fred G. Wood, " "
EM—Fred G. Wood, " "
MS—William Wallace, " "
SM—Wm. McClanahan, " "
S of H—Mules and head and tail rope. Track gauge 42 inches.
S of M—Pick.
PP—1 Water tube boiler, 4 pumps.
EMP—40.
Sales Agents, West Virginia Coal Co., Richmond, Va.

WOOD-SULLIVAN COAL CO.
Drift Mine; Beckley Seam, 54 to 90 in. thick.
PO—Mullens, W.Va., (Temporary address), SP—Stone Coal, W.Va.; CTY—Wyoming; RR—Virginian.
PR—C. H. Mead......Maben, W.Va.
TR—J. C. Sullivan...Mullens, W.Va.
GM—J. C. Sullivan, " "
PA—J. C. Sullivan, " "
EM—Philip Konrad, Kanawha Falls, W.Va.

WRIGHT COAL & COKE CO.
Wright Nos. 1 and 2 Mines, Drift, Fire Creek Seam.
PO—Wright, W. Va. SP—Same. CTY—Raleigh. RR—C. & O.
PR—F. M. Lee........Alpoca, W. Va.
GM—C. B. Stewart.....Wright, W. Va.
MS—C. B. Stewart, " "
SM—Pedro Benner, " "
S of H—Elec. loco.
S of M—Elec. mach.
PP—2 boilers, total 300 H. P., 250 volts D. C.
EMP—200.

WYATT COAL CO.
General Office, Charleston, W. Va.
PR—John Laing ....Charleston, W.Va.
GM—John Laing, " "
TR—T. J. Robson, " "
GS—James Martin, " "
PA—O. E. Byrd.......Sharon, W. Va.
EM—B. M. Green...Charleston, W. Va.
MM—T. T. Kay......Sharon, W. Va.
EE—T. T. Kay, " "
SCO—Wyatt Coal Co. Buyer, E. O. Boyd, Sharon, W. Va.
Sales Mgr., E. F. Bardin, Charleston, W.Va.

Berlin Mine; Drift; No. 2 Gas Seam, 60 to 72 in. thick.
PO—Laing, W. Va., SP—Berlin, W. Va., CTY—Kanawha. RR—C. & O., Cabin Creek, Branch.
MS—James Martin, Charleston, W. Va.
S of H—Mules and 2 elec. loco., track gauge 44 in.
S of M—2 elec. mach.
PP—1 return tubular boiler, 150 H. P., 500 volts D. C., 2 pumps.
EMP—80.

Horton North and Horton South Mines, Drifts; Coalburg Seam, 54 to 72 in. thick.
PO—Sharon, W. Va., SP—Same, CTY—Kanawha. RR—C. & O., Cabin Creek Branch.
S of H—Mules and 5 elec. loco. Track gauge 44 in.
S of M—10 Elec. machines.
PP—2 pumps. Purchase power.
EMP—225.
Oakley Mine; Drift; Lewiston Seam; 42 to 66 in. thick.
PO—Giles, W. Va.; SP—Same; CTY—Kanawha. RR—C. & O., Cabin Creek Branch.
S of H—Mules and 4 elec. loco. Track gauge 44 in.
S of M—4 Elec. machines.
PP—2 return tubular boilers, total 300 H. P., 2 gen. units, 500 volts D. C., 1 pump. Purchase power.
EMP—85.

WYOMING COAL CO.
PO—Wyco, W. Va.; SP—Same; CTY—Wyoming; RR—Virginian.
PR—W. P. Tams, Jr.....Tams, W.Va.
VP—J. W. Wilson " "
Secy—J. O. Watts......Lynchburg, Va.
TR—J. O. Watts, " "

YUMA COAL & COKE CO., THE
Yuma Mine; Drift; Island Creek Seam; 76 in. thick.
PO—Wilkinson, W. Va.; SP—Logan, W. Va.; CTY—Logan; RR—C. & O., Guyan Valley Br.
PR—A. D. Robertson....Shamokin, Pa.
TR—C. K. Robertson, " "
GM—Thos. F. Downing, Wilkinson, W.Va.
Asst Mgr—A. A. Hamilton, Jr., Wilkinson, W. Va.
PA—A. A. Hamilton, Jr,. Wilkinson,W.Va.
MM—E. M. Stevens, " "
SM—W. E. Simpson, " "
MF—W. L. Stevens. " "
EM—W. C. McCall......Logan, W.Va.
S of H—5 Elec. loco.; track gauge, 48 in.
S of M—5 Elec. mach.
PP—2 Water tube boilers, total 400 H. P., 2 gen. units, 250 volts D. C.
EMP—125. Last fiscal year output 138,231 tons.
Sales Agency, Jewett, Bigelow & Brooks, Detroit, Mich., and Clear Creek Coal Co., Huntington, W. Va.

YUKON POCAHONTAS COAL CO.
General Office, Yukon, W. Va.
Yukon Mine; Drift; War Seam; 60 to 72 in. thick.
PO—Yukon, W. Va.; SP Susanna; CTY—McDowell; RR—N. & W., Dry Fork branch.
PR—W. F. Harman.....Tazewell, Va.
TR—W. T. Gillespie, " "
GM—H. M. Meyers.....Yukon, W. Va.
PA—H. M. Meyers, " "
GS—P. P. Kerr, " "
MS—P. P. Kerr, " "
EM—C. H. Deaton, " "
EE—J. R. Hunt, " "
SCO—Address the Company. Buyer, D. C. Perry, Yukon, W. Va.
S of H—4 elec. locos. Track gauge 44 in.
S of M—3 elec. mach.
PP—2 water tube boilers, total 300 H. H., 1 gen. unit, 250 volts D. C.

ZENITH COAL & COKE CO.
See United Pocahontas Coal Co.

KEYSTONE
THE.
MINING
CATALOG
COMBINED WITH
COAL FIELD
DIRECTORY
CONSOLIDATED PUBLISHING COMPANY INC.

MINING CATALOGUES

WYOMING

For List of Abbreviations See Page 622.

ACME COAL CO.
New Acme Mine; Drift; Monarch Seam, 18 ft. thick.
PO—Acme, Wyo. SP—Alger, Wyo. CTY—Sheridan. RR—C. B. & Q.
PR—A. K. Craig.........Acme, Wyo.
MS—W. G. Craig, " "
GS—A. K. Craig, " "
CE—A. K. Craig, " "
PA—A. K. Craig, " "
TR—Ora Darnall, " "
GM—Ora Darnall, " "
MM—Chas. Shott, " "
EE—Chas. Shott, " "
SCO—Acme Trading Co. Buyer, H. H. Sniveley, Acme, Wyo.
S of H—4 elec. loco. Track gauge 42 in.
S of M—4 elec. mach.
PP—3 Hiene boilers, total 333 H. P., 2 gen. units, 2,200 volts A. C., 3 phases, 60 cycles; 6 pumps. power also purchased.
EMP—200. Last fiscal year output 170,000 tons.
Sales agent, Ora Darnall, Acme, Wyo.

AMALGAMATED DEVELOPMENT CORP.
General Office, 516 Fifth Ave, New York.
Model Mine; Shaft; Carney Vein; 186 in. thick. Will operate washery in Sept.
PO—Sheridan, Wyo.; SP—Alger; CTY—Sheridan; RR—C. B. & Q.
PR—Dr. G. H. Dawsey..New York, N. Y.
TR—Albert J. Magee, " "
GM—Belmont B. Magee..Sheridan, Wyo.
PA—Belmont B. Magee, " "
GS—James J. Lytle...Carneyville, Wyo.
MS—George Gebo, " "
EM—George Gebo, " "
MM—Charles Rarick, " "
EE—Charles Rarick, " "
SCO—H. W. Newton General Store. Buyer, H. W. Newton, Carneyville, Wyo.
S of H—Horses and elec. loco. Track gauge 42 in.
S of M—1 Sullivan comp. air mach.
PP—1 pump. Purchase power.
Note—Successors to Model Mining Co.

BEAR RIVER COAL CO.
Bear River Mine No. 1, Slope, Sub. Bituminous Seam, 216 to 288 in. thick.
PO—Evanston, Wyo.; SP—Samel CTY—Uinta; RR—Union Pacific.
PR—Geo. E. Pexton..Evanston, Wyo.
TR—O. H. Shoup, Colo. Springs, Colo.
GM—J. H. Martin......Evanston, Wyo.
PA—J. H. Martin, " "
MS—J. H. Martin, " "
EM—O. E. Bradury, " "
MM—Hans Schouwalt....Evanston, Wyo.
S of H—Mules and Comp. air loco. Track gauge 36 in.
S of M—Hand and 6 comp. air. mach.
PP—3 return tubular boilers, total 375. H. P., 2 air comp. and 2 pumps.
EMP—27. Last fiscal year output 38,293 tons.

BIG HORN COLLIERIES CO.
General Office, Denver, Colo.
Big Horn Mine; Slope; Owl Creek Seam, 72 to 144 in. thick.
PO—Crosby, Wyo.; SP—Kirby, Wyo.; CTY—Hot Spring; RR— C. B. & Q.
PR—Jas. R. Thrope....Denver, Colo.
TR—M. C. Moyers, " "
VP—Herbert Addison, " "
PA—Herbert Addison, " "
EM—Herbert Addison, " "
MS—Frank Anderson, Jr., Crosby, Wyo.
MM—R. E. Fleming, " "
EE—R. E. Fleming, " "
SCO—Big Horn Trading Co. Buyer, W. A. O'Neil, Crosby, Wyo.
S of H—2 Elec. loco. and rope track gauge 36 in.
S of M—8 elec., 6 comp. air mach.
PP—5 Reurn tubular boilers, total 750 H. P., 2 gen. units, 2640 volts A. C., and 250 volts D. C., 3 phase, 60 cycles, 2 comp., 1 pump.
Last fiscal year output 189,984 tons.

CAMBRIA FUEL COMPANY (THE)
Cambria Mines, Nos. 3 and 4 Antelope, Drift; Bituminous (Coking) Seam; 3 to 20 ft. thick.
PO—Cambria, Wyo.; SP—Same; CTY—Weston. RR—C. B. & Q.
PR—B. F. Overholt....Scottdale, Pa.
VP—Lewis T. Wolle......Akron, Ohio
TR—Walter Schoonmaker.Cambria, Wyo.
Secy—Walter Schoonmaker, " "
MS—Chas. V. Westover, " "
SCO—Cambria Commercial Co. Buyer, R. R. Randall, Cambria, Wyo.
S of H—Horses, hoists, haulage rope and 8 comp. air locos.; track gauge 42 in.
S of M—20 comp. air mach.
PP—4 Water tube and 1 return tubular boiler, total 1025 H. P., 750 K. W. mixed turbine, 2300 volts, A. C., 3 phases, 60 cycles, 3 high pressure, 4 low pressure air comp.; 5 pumps.
EMP—436. Last fiscal year output (178 days worked) 339,772 tons.
Sales Agent, Walter Schoonmaker, Cambria, Wyo.

CARNEY COAL COMPANY.
Carney Mine, Drift, Carney Seam, 16 to 18 ft. thick.
PO—Carneyvile Wyo.; SP—Alger, Wyo., CTY—Sheridan; RR—C. B. & Q., Main Line.
PR—W. J. Carney......Chicago, Ill.
TR—Quinton Johnstone, Jr., Chicago, Ill.
GM—C. B. Seymour....Carneyville, Wyo.
PA—C. B. Seymour, " "
GS—R. E. Gildroy, " "
EM—R. E. Gildroy, " "
MS—Walter Upton, " "
MM—R. G. Montgomery, " "
EE—R. G. Montgomery, " "
SCO—Carney Trading Co. Buyer, J. H. Farrell, Carneyville, Wyo.
S of H—6 elec. loco. Track gauge 42 in.
S of M—11 elec. mach.
PP—4 Return tubular boilers, 2 Erie City, 2 Kewanee, total 600 H. P., 2 gen. units, 250 volts, D. C.; 3 pumps.
EMP—375. Last fiscal year output 190,772 tons.
Sales Agent, C. B. Seymour, Carneyville, Wyo.

CENTRAL COAL & COKE CO.
General Office, Kansas City, Mo.
3 Mines in Wyoming, 3 in Missouri, 2 in Oklahoma, 7 in Arkansas, 9 in Kansas.
Nos. 1, 2 and 3 Mines; Slopes and Drift; Rock Springs Seam, 72 to 84 in. thick.
PO—Rock Springs, Wyo.; SP—Same; CTY—Sweetwater; RR— U. Pac.
PR—Charles S. Keith.Kansas City, Mo.
VP—Harry N. Taylor, " "
TR—E. E. Riley.....Kansas City, Mo.
PA—Thos. Mackie, " "
SM—Thos. Mackie, " "
GS—Wm. Harkes.. Rock Springs, Wyo.
MS—A. Vail......Rock Springs, Wyo.
CE—J. O'Flaherty...Kansas City, Mo.
S of H—2 elec. loco.
S of M—Elec. mach. and hand.
PP—4 water tube boilers, 1000 H. P., 2 gen. units, 2300 volts A. C., 3 phase, 60 cycles.
EMP—416.

COLORADO-KANSAS COAL COMPANY.
General office, 404 Bank Block Denver, Colorado.
Colorado-Kansas Coal Co. Mine; Slope and drift; 19½ to 22 ft. thick.
PO—Carbon, Wyo; SP—Same RR—U. P.
PR—E. H. Sudendorf, ...Denver, Colo.
TR—Abner Graves, " "
SEC—Abner Graves, " "
CE—Abner Graves " "
S of H—Traction engine.
S of M—Hand.
Note—Formerly the Colorado-Wyoming Coal Company.

COLORADO-WYOMING COAL CO.
See Colorado-Kansas Coal Co.

DIAMOND COAL & COKE CO.
General Office, Butte, Mont.
PR—John D. Ryan....New York, N.Y.
GM—F.W.C.Whyte...Anaconda, Mont.
PA—D. A. Welch......Butte, Mont.
GS—Thos. Sneddon..Diamondville, Wyo.
EM—R. R. Vail, " "
MM—Joe Kaufman, " "
EE—John Platt, " "
SCO—Mountain Trading Co., buyer C.S. McDonald, Diamondville, Wyo.
Sales Agent, D. M. McAllister, Diamondville, Wyo.

Diamondville No. 1 Mine; Slope, Kemmerer Seam, 7 to 14 ft. thick.
PO—Diamondville, Wyo.; SP—Same; CTY—Lincoln, RR—O. S. L.
MS—Wm. Armstrong, Diamondville,Wyo.
S of H—Mules and rope; track gauge 3 ft
S of M—Hand and 5 Comp. air mach.
PP—11 Return tubular boilers, 1 gen. unit, 440 volts A. C., 3 phases, 1 comp., 2 pumps.

Oakley No. 2 Mine, Slope, Kemmerer Seam 7 to 14 ft. thick.
PO—Oakley Wyo.: SP—Diamondville;CTY—Lincoln, RR—O. S. L.
MS—Wm. Armstrong, Diamondville,Wyo.
S of H—Mules and rope; track gauge 3 ft
S of M—Hand and 3 Comp. air mach.
PP—8 Return tubular boilers, 1 Air comp., 1 pump.
EMP—120. Lost fisca lyear output, 150,168 tons.

Glencoe No. 4 Mine, Slope, Kemmerer Seam 7 to 14 ft. thick.
PO—Glencoe, Wyo.; SP—Same; CTY—Lincoln. RR—O. S. L.; Cumberland Br.
MS—Wm. Armstrong, Diamondville,Wyo.
S of H—Mules and rope; track gauge 3 ft
S of M—Hand and 10 Comp. air mach.
PP—7 Return tubular boilers, 1 compressor and 1 pump.
EMP—120. Last fiscal year output, 94,179 tons.

FAIRVIEW COAL CO.
Fairview Coal Co. Mine; Slope; Subbituminous Seam, 60 to 78 in. thick.
PO—Glenrock, Wyo.; SP—Same; CTY—Converse; RR—C. & N. W.
PR—E. L. Kingsley....Madison, S. D.
GM—E. L. Kingsley, " "
GS—E. L. Kingsley, " "
PA—E. L. Kingsley, " "
TR—Fay Kingsley, " "
MS—E. Morgan........Glenrock, Wyo.
MM—Chas. Skinner, " "
S of H—Rope.
S of M—2 Comp. air mach.
PP—1 Return tubular boiler, 150 H.P., 1 compressor, 2 pumps.
EMP—10 to 40. Last fiscal year output 19,240 tons.

GUNN-QUEALEY COAL COMPANY.
General Office, Gunn, Wyo.
Slope; "B" Seam, 6 ft. thick.
PO—Gunn, Wyo. SP—Rock Springs, WYO.; CTY—Sweetwater; RR—Union Pacific.
PR—P. J. Quealy....Kemmerer, Wyo.
GM—P. J. Quealey, " "
TR—Wm. E. Decker, 143 Liberty St., New York.
GS—Wm. Monay.....Kemmerer, Wyo.
PA—R. B. Roberts........Gunn, Wyo.
MM—James Coles, " "
SCO—Desert Trading Co. Buyer, Andrew Johnson, Gunn, Wyo.
S of H—Rope and mules.
S of M—Hand and 4 elec. mach.
PP—Boilers total 450 H. P., 2 gen. units, 250 volts, D. C.; 1 pump.
EMP—175. Last fiscal year output 159,918 tons.
Sales Agent, T. J. O'Brien, Salt Lake City, Utah.

KEMMERER COAL CO.
PR—M. S. Kemmerer..New York, N.Y.
TR—J. L. Kemmerer, " "
GM—P. J. Quealy....Kemmerer, Wyo.
PA—P. J. Quealy, " "
Asst GM—Wm. Monay...Frontier, Wyo.
MS—C. S. Beach, " "
EM—C. S. Beach, " "
EE—John Green, " "
MM—John Lofgren......Frontier, Wyo.
SCO—Frontier Supply Co., Buyer, R. M. Turner, Frontier, Wyo.
Sales agent, T. J. O'Brien, Salt Lake Ciy, Utah.

Nos. 1 and 3 Mines; Slope, Kemmerer Seam, 60 to 144 in. thick.
PO—Kemmerer, Wyo.; SP—Same; CTY—Lincoln; RR—O. S. L.
S of H—Mules.
S of M—Hand.
PP—4 Water tube, 2 return tubular boilers, total 900 H. P., 2 gen. units 2300 volts A. C., 3 phase, 60 cycles; power furnished from Frontier Supply Co., and used at all mines.
EMP—203. Last fiscal year output 215,000 tons.

No. 4 Mine; Slope; Willow Creek Seam; 60 to 69 in. thick.
PO—Kemmerer, Wyo.; SP—Same; CTY—Lincoln; RR—O. S. L., Willow Creek Br.
S of H—Mules.
S of M—Hand.
PP—2 Water tube boilers, total 300 H. P.
EMP—178. Last fiscal year output 127,000 tons.
Idle at present.

No. 5 Mine; Slope; Willow Creek Seam 60 to 96 in. thick.
PO—Kemmerer, Wyo.; SP—Same; CTY—Lincoln; RR—O. S. L., Willow Creek Br.
MF—P. F. Patterson......Sublet, Wyo.
S of H—4 Elec. loco. and mules; track gauge 42 in.
S of M—1 Comp. air.
PP—5 Water tube boilers, total 750 H. P.
EMP—250. Last fiscal year output 210,000 tons.

No. 6 Mine; Slope; Willow Creek Seam; 72 to 96 in .thick.
PO—Kemmerey, Wyo.; SP—Same; CTY—Lincoln; RR—O. S. L., Willow Creek Br.
S of H—Mules.
S of M—Hand.
PP—4 Water tube boiler, total 600 H. P.
EMP—175. Lat fiscal year output 56,000 tons.
Note—Nos. 1 and 4 idle at present, May 22nd, 1916.

KOOI, PETER.
Kooi Mine, Drift, Monarch Seam, 22 to 30 in. thick.
PO—Kooi, Wyo.; SP—Alger; CTY—Sheridan; RR—C. B. & Q.
PR—Peter Kooi..........Kooi, Wyo.
GM—Peter Kooi, " "
PA—Peter Kooi, " "
MS—R. F. Hotchkiss, " "
SCO—Kooi Trading Co. Buyer, A. N. Waymack, Kooi, Wyo.
S of H—Horses and 4 elec. loco. Track gauge 442 in.
S of M—4 elec. mach.
PP—250 volts D. C., power purchased.
EMP—225. Last fiscal year output 200,000 tons.
Sales Agencies, National Fuel Co., Billings, Great Falls and Butte, Mont., Carbon Coal & Supply Co., Omoha, Neb., C. L. Jones, Spokane, Wash.

LION COAL CO.
General Office, Ogden, Utah.
Lion Mine; Slope; Nos. 1 and 3 Seams; 72 to 96 in. thick.
PO—Rock Springs, Wyo.; SP—Same; CTY—Sweetwater; RR—U. P.
PR—Joseph Scowcroft......Ogden, Utah
TR—Royal Eccles, " "
GM—D. H. Pape, " "
PA—H. C. King, " "
GS—R. Y. Gibson....Rock Springs, Wyo.
EM—R. Y. Gibson, " "
MS—J. L. Libby, " "
MM—D. C. McKeehan, Rock Springs, Wyo.
EE—D. C. McKeehan, " "
SM—H. C. Marchant....Ogden, Utah.
S of H—Mules; track gauge 42 in.
S og M—4 Elec. mach.
PP—5 water tube boilers, total 600 H. P., 1 gen. unit, 1 pump.
EMP—150. Last fiscal year output 128,906 tons.

MODEL MINING COMPANY.
Now Amalgamated Development Corp.

MONARCH COAL MINING COMPANY
General Office,, Monarch, Wyo.
Monarch No. 1 Mine; Slope; "Monarch" Seam, 384 to 408 in. thick.
PO—Monarch, Wyo.; SP—Alger, Wyo.; CTY—Sheridan, Wyo.; RR—C. B. & Q.
PR—M. F. Peltier........Chicago, Ill.
TR—E. L. Waddell.....Monarch, Wyo.
GM—M. F. Peltier, " "
MS—Geo. Wilkinson " "
EM—R. P. Fitch, " "
MM—Clarence Hilton " "
EE—Clarence Hilton " "
SM—E. F. Alexander " "
SCO—Monarch Trading Co., Monarch, Wyo.
S of H—Horses and 5 elec. locos. Track gauge 42 in.
S of M—8 elec. mach.
PP—5 pumps. Power purchased.
EMP—400. Last fiscal year output 310,000 tons.
Sales agent, E. L. Waddell, Monarch, Wyo.
Note—Successors to Wyoming Coal Mining. Co.

NEBRASKA COAL CO.
Nebraska Mine Slope; Upper Laramil Seam, 102 in. thick.
PO—Rawlins, Wyo. SP—Same. CTY—Carbon.
PR—J. J. Cullen......Rawlins, Wyo.
TR—J. J. Culien.....Rollins, Wyo.
GM—H. Larsen, " "
PA—H. Larson, " "
MS—H. Larsen, " "
S of H—Mules and steam; track gauge 30 in.
S of M—Hand.
PP—1 pump.
EMP—2 to 4. Last fiscal year output 1,827 tons.

OWL CREEK COAL CO.

Owl Creek Mine; Slope; Gebo Seam, 72 to 144 in. thick.
PO—Gebo, Wyo.; SP—Kirby; CTY—Hot Springs; RR— C. B. & Q., Billings, Denver, Br.
PR—R. J. Ireland...Amityville, N.Y.
TR—M. P. Myton, " "
GS—C. A. Barnard......Gebo, Wyo.
PA—C. A. Barnard, " "
MF—J. R. Kirby, " "
EE—James C. Rae, " "
MM—James C. Rae, " "
SCO—Owl Creek Mercantile Co. Buyer, C. A. Barnard, Gebo, Wyo.
S of H—Mules, 2 Elec. loco. and rope; track gauge 42 in.
S of M—11 elec. and 13 comp. air mach.
PP—7 Erie City Iron Works return tubular boilers, total 950 H. P., 3 gen. units, 250 volts D. C., 3 phase, 60 cycles, 2 air comp., 1 pump.
EMP—200. Last fiscal year output, 210,111 tons.

POPOSIA COAL CO.

Poposia Mine; Slope; Seam 96 to 192 in. thick.
PO—Poposia, Wyo.; SP—Hudson, Wyo.; CTY—Fremont; RR—W. & N. W.
PR—W. F. McNally, New Richmond, Wis.
TR—P. J. O'Connor......Cooper, Wyo.
GM—H. O. Barber......Hudson, Wyo.
GS—John Younger " "
MS—Wm. Hotchkiss " "
SCO—Poposia Coal Co. Store, Poposia, Wyo.
S of H—Horses.
S of M— Hand.
EMP—150. Last fiscal year output, 170,000 tons.

ROCK SPRINGS-GIBRALTAR COAL MNG. CO.

No. 3 Mine, Drift, Seam 6 ft. thick.
PO— Black Buttes, Wyo.; SP—Same; CTY—Sweetwater; RR—U. P.
PR—Gus Sturholm..Rock Springs, Wyo.
TR—Phillip Sturholm, " "
GM—Moses E. Harvey, Black Buttes, Wyo
MS—Moses E. Harvey, " "
PA—S. H. Harvey, " "
SM—S. H. Harvey, " "
S of H—Mules; track gauge 3 ft.
S of M—Hand.
PP—1 Water tube boiler, 1 pump.
EMP—12.
Sales Agent, I. M. Cox.
Idle during past ten months.

ROCKY MTN COAL & IRON CO.

General Office, Crocker Bldg., San Francisco, Cal.
Mine Nos. 6 and 8, Slope; Seam 10 to 18 ft. thick.
PO—Evaston, Wyo. SP—Same. CTY—Uinta; RR—Union Pacific.
VP—W. H. Crocker..San Francisco, Cal.
S of H—Mules; track gauge 3 ft.
S of M—Hand.
PP—4 Return tubular boilers, total 270 H. P.
Not operating at present.

ROSIN COAL CO.

Rosin Mine, Drift, Sub. Bituminous Seam 5½ ft. thick.
PO—Lost Spring, Wyo. SP—Same. CTY—Converse; RR—C. & N. W., and W. N.
PR—P. E. McKillys..Lost Spring, Wyo.
TR—D. B. McMahon, " "
GM—F. G. Kloke, " "
PA—F. G. Kloke, " "
S of H—Elec. locos.; track gauge 36 in.
S of M—1 Elec. mach.
PP—Boilers, total 150 H. P., 1 gen. unit, 220 volts D. C.
EMP—50.

SHERIDAN COAL CO. (THE)

General Office, Omaha, Neb.
Sheridan Mine Nos. 4 and 7; Slope; Sheridan No. 2 Seam; 48 to 156 in. thick.
PO—Dietz, Wyo.; SP—Same; CTY—Sheridan; RR—C. B. & Q.
PR—G. W. Megeath....Omaha, Neb.
TR—A. P. Whitmore, " "
GM—H. S. Hopka.......Dietz, Wyo.
SM—H. S. Hopka, " "
MS—L. J. Cake, " "
EM—L. J. Cake, " "
MM—Geo. Dorris, " "
EE—Geo. Dorris, " "
SCO—Dietz Trading Co. Buyer, C. W. Lawrence, Dietz, Wyo.
S of H—8 Elec. locos. and mules; track gauge 42 in.
S of M—Hand and 9 comp. air mach.
PP—3 Return tubular boilers, total 450 H. P., 1 gen. unit, 250 volts D. C., 2 pumps, 1 air comp.; buy power and have an M. G. set.
EMP—220. Last fiscal year output, 170,000 tons.
Sales Agent, F. Richardson, G. S. A., Omaha, Neb.

SUPERIOR COAL CO.

Now Union Pacific Coal Co.

UNION PACIFIC COAL CO.

General Office, Cheyenne, Wyo.
GM—F. A. Manley....Omaha, Nebr.
GM Ass't—W. D. Brennan, Cheyenne, Wyo
PA—W. K. Lee, " "
MM—Robert Muir..Rock Springs, Wyo.
EM—W. L. Cowdrey.....Superior, Wyo.
EE—T. A. Utley, " "
SM—E. B. Treat.....Cheyenne, Wyo.

Rock Springs Nos. 4, 7, 8, 10, Hanna Nos. 2, 3, 3½ 4, Reliance Nos. 1, 3 and 4 Mines; Shafts, Slopes and Drifts; Rock Springs and Hanna Seams, Hanna 8 to 35 ft. thick, R. S. 4½ to 11 ft. thick.
PO—(R. S.) Rock Springs, Wyo., (H) Hanna, Wyo., (R) Reliance, Wyo.; SP—Same; CTY—(R.S.—H) Carbon (R) Sweetwater. RR—U.P.
MS—(R.S.) D.S.Thomas, Rock Springs, Wyo. (H) W.M.Hartman, Hanna, Wyo. (R) F.J.McCarty, Reliance, Wyo.

S of H—21 Elec., 2 gasoline locos., mules and rope and gravity; track gauge (R.S.) 30 in. (H) 42 in.
S of M—34 Elec. 26 comp. air mach. and hand.
PP—25. Water tube, 9 return tubular H. P., 8 5000 boilers, gen. units 2300 volts A. C., 3 phase, 60 cycles, 500 and 250 volts D. C., 4 comp. and 12 pumps.
EMP—2553. Last fiscal year output, 1,780,490 tons.

Cumberland Nos. 1 and 2, Slope, Kemmerer Seam, 6 to 18 ft. thick.
PO—Cumberland, Wyo.; SP—Same; CTY—Lincoln; RR—O. S. L.
MS—J. M. Faddies..Cumberland, Wyo.
S of H—Rope; track gauge 42 in.
S of M—Hand.
PP—6 Water tube, 10 return tubular, boilers, total 4200 H. P., 2 gen. unit, 2300 A. C., 3 phase, 60 cycles; 2 pumps.
EMP—465. Last fiscal year output 417,508 tons.

A, B, C, D, and E Mines; Slope; Nos. 1, 7 and 3, Vandyke Seams.
PO—Superior, Wyo.; SP—Same; CTY—Sweetwater; RR—U. P.
MS—Frank S. Davis....Superior, Wyo.
SM—James McPhie " "
S of H—Rope, elec., and gaso. locos. and mules.
S of M—Hand and elec.
PP—10 Boilers, 2500 H. P., gen. units, 2300 volts A. C.
EMP—1500.
Formerly operated by Superior Coal Co.

U. S. COAL CO.

In Bankruptcy.

WYOMING COAL CO.

General Office, Eccles Bldg., Ogden, Utah.
Star Mine; Slope; No. 7 Seam; 66 to 84 in. thick.
PO—Rock Springs, Wyo; SP—Same; CTY—Sweetwater; RR—U. P.
PR—Jos. Scowcroft, ...Ogden, Utah
GM—D. H. Pape, " "
PA—H. C. King..........Ogden, Utah
GS—R. Y. Gibson, Rock Springs, Wyo.
EM—R. Y. Gibson..Rock Springs, Wyo.
MS—H. H. Gibson, " " "
MM—D.C.McKeehan, " " "
EE—D.C.McKeehan, " " "
S of H—Mules.
S of M—Hand
PP—5 water tube boilers, total 600 H. P., 1 gen. unit, 2 pumps.
EMP—125. Last fiscal year output 88,908 tons.

KEYSTONE
THE.
MINING
CATALOG
COMBINED WITH
COAL FIELD
DIRECTORY
CONSOLIDATED PUBLISHING
COMPANY Inc.

UNIVERSITY OF ILLINOIS LIBRARY
FEB 5 - 1921

UNIVERSITY OF ILLINOIS-URBANA
3 0112 110331375